

Review of Appendix X – Behavioural microsimulation modelling

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Appendix X aims to outline the approach behind the results for the eight ECEC Subsidy policy options that were modelled for the PC Inquiry into the ECEC sector. It provides detailed information on the various steps taken to obtain these results. Overall, I think the analyses described in this appendix are sound, and so my comments relate mostly to presentation and structure of the appendix. In this review, I considered the following:

- the fitness for purpose of the approach used
- any major omissions from the analysis
- the clarity of the exposition
- any other comments which would strengthen the appendix.

Fitness for purpose – yes

To assess hypothetical policy reforms before they are actually introduced, so-called tax and transfer microsimulation modelling is really the only possible approach. As the ultimate aim of the proposed policy options is to change families' behaviours with regard to formal childcare usage and labour force participation (including the amount of labour supply), the microsimulation model requires the ability to predict families' changes in childcare usage and labour supply (i.e. it needs to be a behavioural microsimulation model). The appendix clearly explains the various choices that are then made given the data that are available and the capabilities of CAPITA/CAPITA-B (the Treasury/DEWR microsimulation model that has been used). Any limitations that arise are clearly stated and explained.

“Major” omissions – more intuitive interpretation and impact on net government expenditure could be provided

All information needed to generate the results for the policy options of interest is provided, but the labour supply and formal care model results could be better explained. The appendix tries to provide an intuitive description of these results, but does not succeed in this, because the coefficients of the model are not readily interpretable. This is due to the complex non-linear functional form of the utility function that is estimated. To provide the reader with more intuitive results, additional calculations are required to generate first order derivatives of the utility function with regard to income, labour supply and formal care in the observed hours points. This will determine whether at the observed data points, utility is increasing or decreasing in income, labour supply and formal care (the constant on the linear terms in the utility function on its own cannot determine this).

In addition, it may be useful to estimate the marginal effects of family and individual characteristics on the hours of labour supply and the hours of formal care to facilitate an intuitive understanding of the models' implications for the readers. Using the utility function with baseline net incomes, the marginal effect of having a vocational education (rather than no post-school qualifications) can be estimated by changing this characteristic for everyone in the sample from 0 to 1 and calculating the difference in predicted labour supply and formal care hours; the other education dummy variables would need to be set to 0 as well, so that the comparison is to parents without tertiary qualifications. All other variables are kept at their observed values. This process could then be repeated for all explanatory variables. Marginal effects for continuous variables like age can be calculated by comparing the predicted values for hours of labour supply and formal care at the observed age to predicted values for these hours after increasing age by 1 year for everyone.

Finally, the simulation results for the 8 policy options focus on government expenditure on ECEC subsidies, but given that this is a behavioural simulation, it would be good to also include the results on other government expenditure (e.g. income support payments) and on government income (e.g. from taxation). Depending on the labour supply responses these expenditures and incomes are also likely to change under the various policy options.

Clarity of the exposition – mostly clear but some room for improvement in the structure of the appendix

Although the appendix generally provides clear explanations of the modelling behind the simulation results, there is in places quite a lot of repetition which could be easily avoided by consolidating this information in one place. Reading the appendix, it feels like there is an appendix for the appendix: that is, A.9 provides additional detail on the modelling and technical details in earlier appendix sections, and tables with results are provided in A.7 and A.8, while the discussion of these results is included in A.3 and A.4. This is likely done to keep the discussion more simple in the first few appendix sections, but in my view this made the appendix more difficult to read and leads to duplication of information (e.g. on excluded observations). It seems reasonable to assume that a reader who chooses to read the appendix is fine for it to include some technical details and substantial tables. Streamlining the appendix by integrating A.9 into A.2 to A.4, A.7 into A.3 and A.8 into A.4 would make it shorter by avoiding duplication and ensures information is provided where the reader expects it. There is also some general detail included which is not relevant to the work done by the Productivity Commission and that could be excluded (e.g. PLIDA is mentioned in the selection criteria but not explained, and then on p.42 it turns out this is not relevant to the analyses; the half page on the treatment of tax deductions could be reduced to the last two sentences of that section).

Most tables are good and easy to read, but there was one exception: the tables with the utility function coefficients were quite messy and could be cleaned up and formatted in a way that would use less space and be more systematic in terms of ordering the estimated coefficients.

Finally there are a few incorrect statements, or awkwardly phrased statements, which could be improved. Rather than provide a list of these in this document, I have made tracked suggestions and comments on the document containing the appendix itself, and similarly I have provided detailed suggestions for restructuring the appendix and improving the layout of Tables A.14 and A.15 in the document itself.

Shortening the appendix in these ways would improve readability, and also create some space for the suggestions regarding marginal effects above.

Other comments – additional proofreading would be useful

I have read the appendix in isolation (i.e. without the main report), so my next suggestion may have been covered in the main text. I thought it would be useful to provide some discussion of the distribution of actual childcare fees paid by families (e.g. mean, median by some key characteristics) and how these actual fees relate to the CCS hourly cap (e.g. proportion of families paying more than the CCS hourly cap).

Finally, while acknowledging that this is a draft document with some components still to be completed, there are a few typos/missing words/awkward sentences to be fixed. I have marked some instances, that I noticed while reading, in the appendix document, but a careful proofreader may be able to suggest additional improvements.