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Economic impacts of the proposed Child Care Subsidy

Final report

Goodstart Early Learning

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February 2016

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Executive summary

The context

In early 2015, the Australian Government announced its response to the Productivity Commission's inquiry into childcare and early childhood learning. As part of the 2015-16 Budget, the Commonwealth Government set out the Families Package which included a new, means tested Child Care Subsidy (CCS) with a minimum level of activity required to be eligible. The CCS is proposed to begin on 1 July 2017 and will replace three existing policies. As part of an additional $3.5 billion package over five years[1], the key impact of the CCS is to reduce the out of pocket costs of child care, particularly for families on incomes below $120,000. The reduced net cost of child care is expected to lead to a greater number of parents making use of child care and taking the opportunity to participate in work.

Some analysis has been undertaken on the efficiencies that might be gained from the CCS. In June 2015, Early Childhood Australia published a regulation impact statement showing regulatory cost savings. The Productivity Commission in its report also estimated the economic impacts in terms of increased workforce participation, Gross Domestic Product and net fiscal savings in a given year based on a different subsidy structure. PwC provided a submission to that Productivity Commission review – *Putting a value on early childhood education and care in Australia* – in which we modelled the impacts on the Australian economy of increased access to quality early childhood education and care (ECEC). Goodstart Early Learning is interested in building on this analysis to understand the economic impacts of the proposed CCS.

This report

Goodstart Early Learning commissioned PwC in September 2015 to model the economic impacts of the proposed CCS. The economic impact analysis in this report establishes a whole of life-cycle value of the economy-wide return of investing in quality ECEC. This was achieved by analysing the impact of the expected reduction in out of pocket ECEC costs out to 2050. We investigated the effects of the proposed CCS, focussing on two key areas (and assuming all other areas being equal):

- **Workforce participation impact and the associated impact on the Australian economy** – the percentage change in labour force participation of parents subsequently entering the workforce, improved future labour force participation of children (when they are of working age) who enter child care as a result of the policy and potential impacts on productivity due to a more experienced workforce

- **Net fiscal impacts** – measuring the costs of the policy against the benefits from increased tax collection with greater workforce participation, improved labour force participation by children who subsequently entered child care, and reduced welfare expenditure with more employment.

At a high level, our approach was limited to reviewing publically available information on the key elements of the proposed CCS and the Productivity Commission's final report (released February 2015), gathering statistical data and applying the findings of these studies to

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[1] Changes announced in late 2015 with the Mid-year Economic and Fiscal Outlook release reduced the proposal to approximately $3 billion. Our analysis has been limited to the changes announced in Budget 2015-16. The limitations to this analysis and areas of further work are noted in this report.

estimate the long term impacts upon GDP and the Australian Government's fiscal position using PwC's Intergenerational Fiscal and Economic Model (IFEM).

The key economic impact from the proposed CCS is estimated to be equivalent to that of a reduction of 24 per cent in the average net price of child care. We applied this impact to the approach set out above and assumed it takes parents three years to adjust their behaviour and take advantage of the reduced out of pocket cost of child care.

Key findings

The key impacts of the proposed CCS by 2050 are estimated as follows:

- the equivalent of an additional 29,000 people working full time joining the workforce by 2050 (about half of which comes from current workers increasing their hours and the other half from new workers joining the workforce)
- an increase of $7.9 billion in real GDP in 2050
- a net fiscal saving to the Australian Government of $4.7 billion (in net present value terms) by 2050.

Economic impacts of the proposed Child Care Subsidy

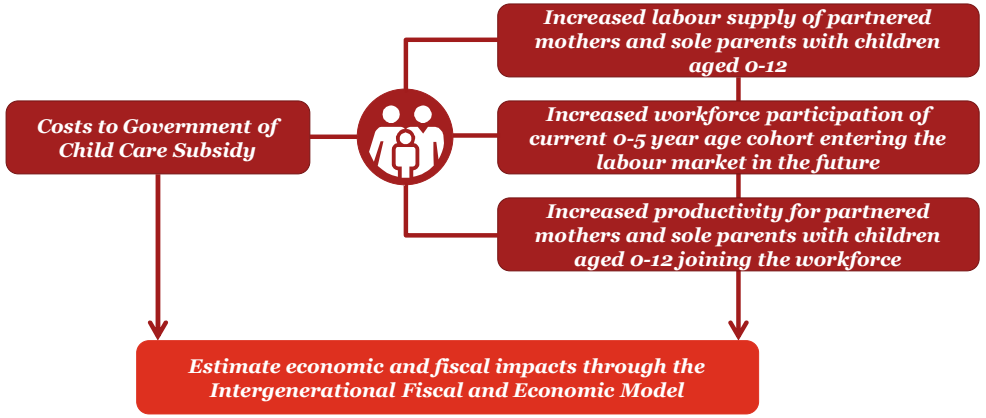
Child care policy reform

In 2015, the Australian Government announced its response to the Productivity Commission's inquiry into early childhood education and care (ECEC). Budget 2015 included a proposal for a new Child Care Subsidy that would decrease the out of pocket cost of child care to many low and middle income families.

Goodstart Early Learning commissioned PwC to estimate the economic impacts of this policy. To do so, we estimated the benefits of the policy relative to the cost to Government within certain parameters therefore establishing an estimated value of the economy-wide return of investing in the CCS

Our approach

To model the impacts of the policy, we considered the costs and benefits...



24% ***estimated reduction in the out of pocket cost of child care results in an estimated...***

Increased workforce participation | ***Contribution to economic growth (GDP)*** | ***Long term net savings to Government***

29,000

Estimated additional FTEs entering the workforce in 2050
Note: This includes the additional hours of work provided by those already in the workforce plus those who would join the workforce, converted into FTEs.

$7.9bn

Estimated contribution to Australia's Gross Domestic Product in 2050
Note: real GDP

$4.7bn

Net savings to the Government by 2050
Note: Net present value terms using a 5% discount rate

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1 Introduction

In 2014, the Productivity Commission (PC) undertook a comprehensive review of Australia's early childhood education and care (ECEC) sector. The review examined issues of accessibility, flexibility and affordability with the aim of making recommendations that allow ECEC to better support children's learning and development needs and the workforce participation of parents, especially women. The PC was required to make recommendations on ECEC funding that are sustainable for taxpayers and include options within current funding parameters.[2] The inquiry received 908 public submissions, including PwC's *Putting a value on early childhood education and care in Australia*.

Investment in ECEC is important because it can lead to increased female workforce participation, which ultimately results in greater productivity and economic growth. Examples that are documented in the literature include Canada, in particular Quebec[3] where its universal access to low fee full time childcare increased women's employment and GDP while reducing the number of people on welfare. Investment in ECEC also improves social mobility and equality of opportunity and also narrows income inequality.[4] For further details on the literature supporting the benefits of ECEC, please see PwC's 2014 paper.

In Australia, mothers' workforce participation rates are below the OECD averages – see Table 1. In its analysis, the PC found that while the participation of women aged 25-54 without children (84 per cent) is close to the overall participation rate for men (90 per cent), participation falls to 66 per cent for women with children (aged 0-14) and to 54 per cent for women with children aged 0-4 years[5].

Table 1: Employment rates for women with dependent child aged under 15

OECD average	Sweden	Denmark	Canada	France	Germany	Australia
66.8	83.1	81.9	74.2	72.4	69	63.5

Note: includes partnered mothers and sole mothers aged 15-64 with at least one dependent child aged 0-14.

Source: Organisation for Economic Co-operation and Development, Maternal employment statistics: Chart LMF1.3.A. Employment rates for partnered mothers and sole mothers, 2013.

The PC found barriers to increasing workforce participation for women with children related to accessing affordable and suitable childcare. This is supported by a 2015 survey which found 92 per cent of parents working part-time identified childcare issues as a barrier to increasing their participation.[6] The PC estimated 165,000 women could be in the workforce (in July 2014) if they had access to affordable and suitable childcare.[7]

Hence, the PC made a number of recommendations that aimed to improve the affordability and accessibility of child care. One of the PC's key recommendations was to combine the Child Care Rebate (CCR), Child Care Benefit (CCB) and the Jobs Education and Training

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2 Productivity Commission, *Childcare and Early Childhood Learning: Overview*, Inquiry Report No. 73, Canberra, 2014, page 3.

3 See PwC, *Putting a value on early childhood education and care in Australia,* September 2014.

4 OECD, Going for Growth 2014 Report on Australia, Available at: http://www.oecd.org/australia/going-for-growth-2014-australia.htm, accessed 7 January 2016

5 Productivity Commission, *Childcare and Early Childhood Learning: Inquiry Report*, Vol. 1, No. 73, Canberra, 2014, p. 190

6 BuzzResearch, *Childcare and Workforce Participation Survey,* Goodstart Early Learning, February 2015

7 Productivity Commission, *Childcare and Early Childhood Learning: Inquiry Report*, Appendix D, Canberra, 2014, , p 853

Child Care Fee Assistance (JETCCFA) into a single child-based subsidy. This subsidy would be means tested at a rate of between 85 per cent for lower income families and 20 per cent for higher income families. Eligibility for the subsidy would also be subject to an activity test of 24 hours of work, study or training per fortnight.[8] The PC's recommendation would help address workforce participation; it estimated the changes would result in the equivalent of 16,400 full time mothers joining the workforce. This equated to an estimated $1.3 billion in GDP. The economic impacts and fiscal costs associated with the PC's recommended options are noted in Table 2 (alongside the recommendation made in its draft report, which was more generous).

Table 2: Productivity Commission estimates of funding options

	Increase in employment	Increase in GDP	Increase in ECEC subsidies	Net fiscal cost
Draft report	47,000	$5.5b	$1.3bn	$0.7bn
Final report	16,400	$1.3b	$266m	$68m

Note: The draft report estimate relates to the '90-30 linear' subsidy option and the final report is an '85-20' subsidy option.

Source: Draft report - Productivity Commission, *Childcare and Early Childhood Learning: Draft Report*, July 2014, pages 2 and 569. Final report - Productivity Commission, *Childcare and Early Childhood Learning: Inquiry Report*, Vol. 1, October 2014, pages 32 and 38.

In May 2015, the Australian Government announced its response to the PC's inquiry. In Budget 2015, the Government adopted a package of reforms similar to that proposed by the PC; in brief the $4.4 billion Families Package included:[9]

- a new Child Care Subsidy (CCS) that would take effect from 1 July 2017 and replace the CCR, CCB and JETCCFA
- the CCS would be means tested, starting at 85 per cent for lower income families, reducing to 50 per cent for higher income families
- an activity test of 8 hours per fortnight of work, training, study or any other recognised activity such as volunteering by parents that accompanied the CCS.

It is in the context of the proposed CCS that Goodstart Early Learning engaged PwC in September 2015 to model the economic impacts on workforce participation as a result of the expected reduction in out of pocket costs.

Structure of this report

The remainder of this report is structured as follows:

- Section 2 briefly sets out the approach to our analysis
- Section 3 presents the results of the economic modelling undertaken
- Section 4 outlines some recommendations for further analysis that could be undertaken
- Appendix A documents the key assumptions and technical notes to the modelling.

8 Productivity Commission, *Childcare and Early Childhood Learning: Overview*, Inquiry Report No. 73, Canberra, 2014, page 44.

9 http://budget.gov.au/2015-16/content/glossy/families/html/families-02.htm Accessed 20 October 2015.

2 Approach

We have undertaken macroeconomic modelling of a number of impacts in order to demonstrate the size of the possible long term economic impacts of increased access to and participation in ECEC as a result of the proposed CCS. This section sets out our approach at a high level and is complemented by a more detailed explanation of our methodology in Appendix A.

Our aim was to investigate the effects of the proposed CCS on two key areas:

- Workforce participation impacts and the associated impact on the Australian economy – the percentage change in labour force participation and improved future labour force participation of children who entered child care as a result of the policy as well as potential impacts on productivity due to a more experienced workforce

- Net fiscal impacts – measuring the costs of the policy against the benefits from increased income tax collection with greater workforce participation and improved labour force participation of children who entered child care due to the policy as well as reduced welfare expenditure with more employment.

By modelling increased labour force participation and productivity, long term improvements from children's participation in ECEC and comparing this to the fiscal impacts, we have established an estimated value of the economy-wide return of investing in the CCS.

2.1 Overview of approach

At a high level, our approach involved:

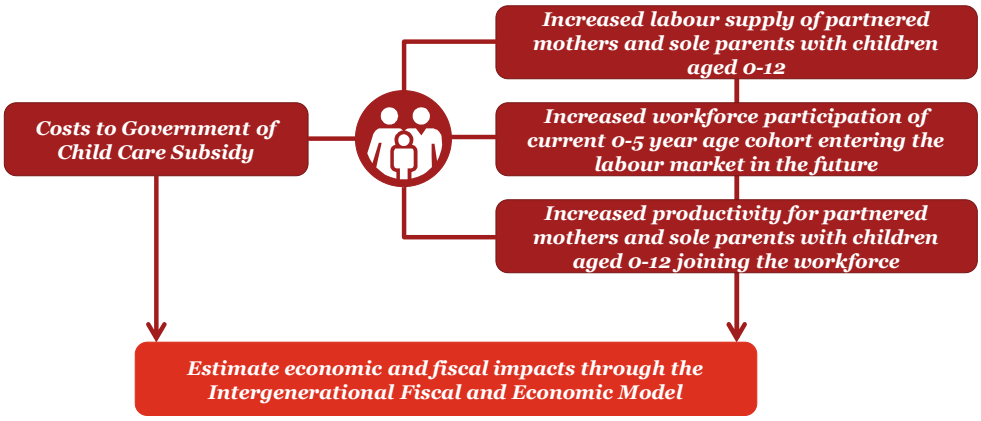
- reviewing publically available information on the key elements of the proposed CCS to understand the changes, potential costs and potential groups of people that might benefit from the changes

- reviewing the Productivity Commission's October 2014 final report, including its approach to modelling potential policy reform scenarios as well as key research pieces that the Productivity Commission relied upon in developing its model

- applying the findings of these studies and gathering statistical data to estimate the long term impacts on GDP and the Australian Government's fiscal position. This involved using PwC's Intergenerational Fiscal and Economic Model (IFEM) to establish a whole of life-cycle value of the economy-wide return of investing in quality ECEC.

The key components of the impacts included in our modelling are summarised in Figure 1. These are described further below along with key assumptions that underpin their development.

Figure 1: Key components of modelling of the proposed Child Care Subsidy



Source: PwC

Our approach builds on that undertaken in our 2014 report *Putting a value on early childhood education and care in Australia*. The previous report's high-level analysis assumed a generic policy mechanism (the case of increasing female labour force participation) and gave an indicative estimate of the value of improving access to quality ECEC. With the benefit of a richer set of data and literature from the PC's ECEC modelling and report and the Government's announced policy commitments in early childhood, we have been able to model a specific policy response, extend the analysis and drill down into greater levels of detail. As a result, the approach is somewhat different from that undertaken in our 2014 paper.

At the same time, there are some impacts that have not been modelled as part of the scope of this project and in this regard our modelling assumes all else is unchanged. These other impacts include:

- the savings in regulatory costs associated with the CCS as outlined in the Regulatory Impact Statement for the Child Care Assistance Package[10]
- adjustments to the proposed Child Care Subsidy that were announced in late 2015, including a lower subsidy level at higher income thresholds
- other elements of the Families Package such as the Nannies Trial (which was part of the original package announced in May 2015 and subsequently adjusted in December 2015)
- the Government's proposed changes to Family Tax Benefits A and B
- additional flow on impacts including the demand for ECEC professionals.

2.1.1 Costs to Government of the proposed Child Care Subsidy

In announcing the new Childcare Subsidy, the Budget Paper on the Families Package foreshadowed that families using childcare with an income between $65,000 and $170,000 would be on average around $30 per week better off under the package.[11] Eligibility for the

[10] http://www.earlychildhoodaustralia.org.au/wp-content/uploads/2015/06/RIS-for-the-Child-Care-Assistance-Package.pdf Accessed 26 October 2015.

[11] Scott Morrison, *Jobs for families child care package delivers choice for families*, 10 May 2015. Available at: http://www.formerministers.dss.gov.au/15859/job-for-families-child-care-package-delivers-choice-for-families/ Accessed 21 October 2015.

new CCS is also subject to meeting the new activity test. For families on incomes below $65,000 who do not meet the activity test, there is also the Child Care Safety Net which entitles them to receive up to 24 hours subsidised care per fortnight.[12]

The current annual cap on the CCR, which is projected to affect more than 114,000 families in 2016-17[13], will be abolished for families with an income below $185,000 and increased from $7,500 to $10,000 for families on higher incomes.

In his speech in July, the then Minister for Social Service stated that the Government's additional investment in childcare would be focused on low and middle income families, and that those on high incomes 'will continue to get the same level of support they have been getting over the years'.[14] The Minister also added that:

> *Currently families earning less than $65,000 effectively receive around 74 per cent of child care fees through the Child Care Benefit and the Child Care Rebate, under the government's new package this subsidy will increase to 85 per cent. A family on $85,000 which receives approximately 70 per cent currently will receive approximately 78 per cent up to the value of fee cap while a family on $120,000 receives about 60% currently and will receive around 67 per cent up to the value of the fee cap.*[15]

These changes are illustrated graphically in Figure 2, where the purple line shows the current system and the blue line shows the proposed system. Based on the Minister's speech it is estimated the proposed CCS effectively reduces child care out-of-pocket expenses by an average of 24 per cent across households. This change in the effective out-of-pocket price of child care leads to an estimated change in hours worked and hours of child care demanded. This assumption was tested with Goodstart and the Department of Education in September 2015.

In December 2015, amendments were made to the proposed Child Care Subsidy. These included that the subsidy would taper down to 20 per cent when family income reaches $340,000 or more. The changes are expected to reduce the additional ECEC costs over the forward estimates by approximately $400 million.[16] This has not been included in this analysis due to the scope being limited to those changes proposed in the 2015-16 budget. However, we note that these will have a relatively lower impact on the behaviour of those households with higher incomes as their demand for child care is less elastic than for households with lower incomes.

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12 http://budget.gov.au/2015-16/content/glossy/families/html/families-02.htm Accessed 21 October 2015.

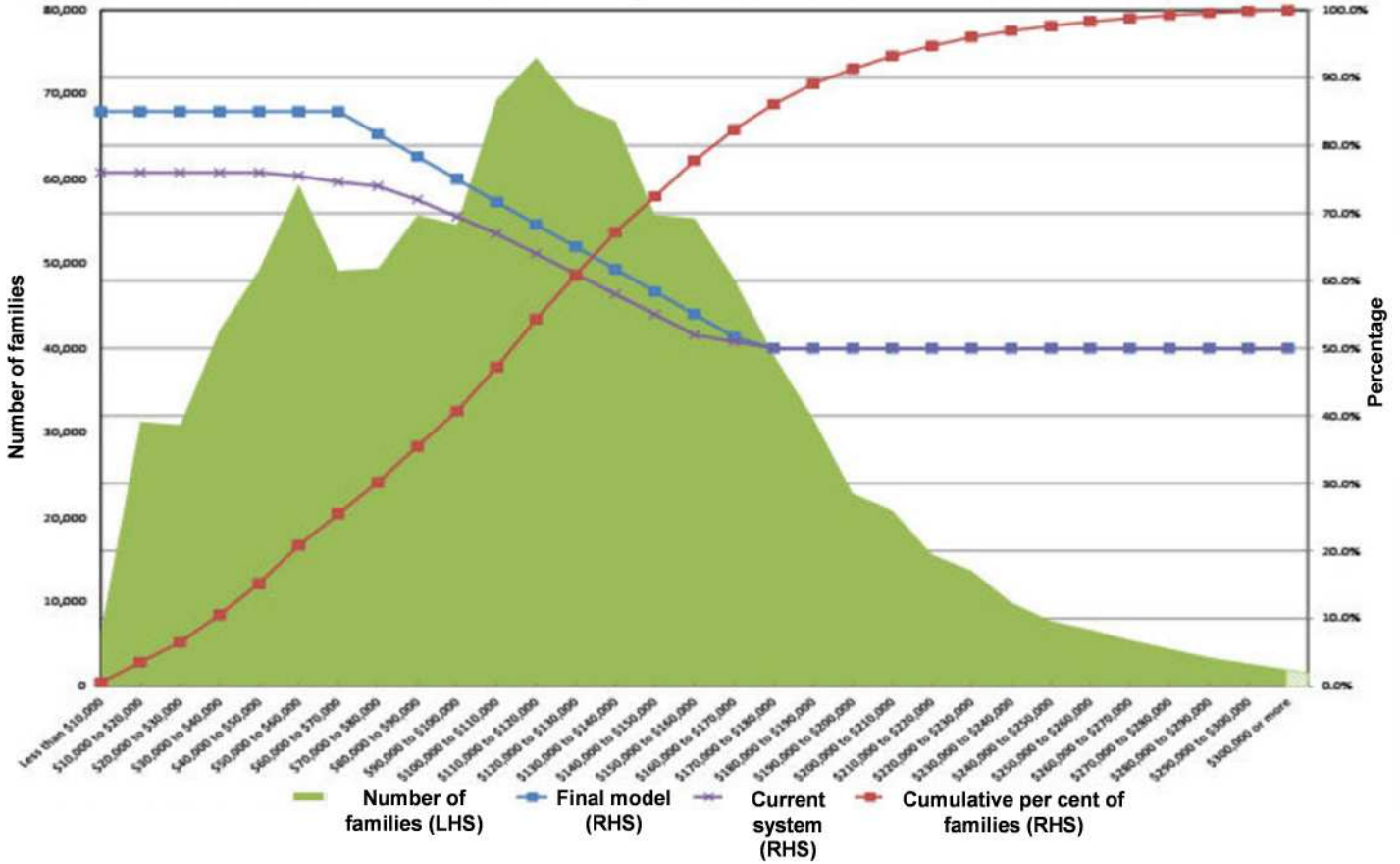
13 Senate Standing Committee on Education and Employment – Education, '*Questions on Notice; Budget Estimates 2014-2015, Outcome 1 – Early Childhood Education and Care, Department of Education Question No. ED0098_15'*, 2015.

14 The Hon Scott Morrison MP, '*Address to the Australian Childcare Alliance Queensland National Conference, Brisbane'*, 18 July 2015, http://www.formerministers.dss.gov.au/15779/address-to-the-australian- childcare-alliance-qld-national-conference-brisbane/

15 Ibid.

16 The changes will reduce the cost of the Child Care Subsidy by $194.6 million in 2017-18 and $210.5 million in 2018-19 relative to the estimates from the 2015-16 Budget announced on May 10 2015. See: http://www.budget.gov.au/2015-16/content/myefo/html/11_appendix_a_expense.htm Accessed 8 January 2016.

Figure 2: Proportion of fees covered: current system compared to Child Care Subsidy, for all services by family income ranges, 2017-18



Note: There are a small proportion of families earning more than $300,000 as depicted by the shaded area. The current system has a $7,500 annual cap for CCR, while the Child Care Subsidy has a $10,000 cap for families earning around $185,000 or more.

Source: This graph is adapted from the graph attached to the Minister for Social Services' 10 May 2015 media release. See: Scott Morrison, *Jobs for families child care package delivers choice for families*, 10 May 2015. Available at: http://www.formerministers.dss.gov.au/15859/job-for-families-child-care-package-delivers-choice-for-families/ Accessed 21 October 2015. Note the attached graph is no longer available at that address but an archive of the media release was provided to PwC by Goodstart.

2.1.2 Increased labour supply of partnered mothers and sole parents with children aged 0-12

Following the approach of the PC and PwC's 2014 report, we have used net child care price elasticities to estimate the additional hours of labour provided by parents either already in the workforce or not in the workforce. The types of households we have included in our analysis are:

- Partnered (couple) mothers[17] with children aged 0 to 5 years, who are likely to attend Long Day Care (LDC) or Family Day Care (FDC)
- Partnered (couple) mothers with children aged 6 to 12 years, who are likely to attend Out of School Hours Care (OSHC)
- Sole parents with children aged 0 to 5 years, who are likely to attend LDC or FDC
- Sole parents with children aged 6 to 12 years, who are likely to attend OSHC

In applying the elasticities from the Gong and Breunig (2012)[18] and Doiron and Kalb (2005)[19] studies, we have assumed that elasticities have not changed over time and that there is a linear relationship in the elasticities – ie a one per cent decrease in the net price of child care has the same absolute magnitude of change in hours supplied by mothers as a one per cent increase in the net price of child care would. While the PC used these two studies in their modelling, it is unclear whether the elasticities were updated.

2.1.3 Workforce participation of current 0-5 year age cohort entering the labour market

In our analysis, we have assumed that there are long-term benefits for children who will receive child care as a result of the policy. These benefits translate into a future increase in employment, as a result of better educational performance associated with participation in ECEC. This draws on studies cited in the PC's 2006 report on the Potential Benefits of the National Reform Agenda, indicating that children from disadvantaged backgrounds receiving ECEC are likely to have better employment prospects than those who do not.[20] As the studies are from an international context, we apply a discount to this to account for the differences in the subject cohort relative to the Australian context.

2.1.4 Increased productivity for partnered mothers and sole parents with children aged 0-12 joining the workforce

We posit that parents joining the workforce due to the policy will gain more work experience than they otherwise would have. At a workforce wide level, more experience is likely to lead to increased productivity.

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[17] Our analysis has been limited to the number of partnered mothers and sole parents who may join the workforce. We acknowledge that this analysis could be extended to partnered fathers, or other carers who may also join the workforce as a result of increased access to child care. However, carers who are not participating in the labour force or are not able to increase their participation in the labour force due to cost or access to child care are mostly mothers. According to the PC, mothers account for more than 90 per cent of carers that are prevented from either working or working longer hours due to a lack of child care and this is even higher for those parents not in the labour force.

[18] Gong, X. and Breunig, R. (2012), *'Estimating Net Child Care Price Elasticities of Partnered Women with Pre-school Children Using a Discrete Structural Labour Supply- Child Care Model'*, Treasury Working Paper 2012-01, November 2012

[19] Doiron, D. and Kalb, G. (2005), *'Demands for Child Care and Household Labour Supply'*, The Economic Record, Vol 81, No. 254, September, 2005, 215-236

[20] Productivity Commission, *Potential benefits of the national economic reform agenda,* Report to the Council of Australian Governments, Canberra, 2006.

Academic literature suggests that there is a statistically significant relationship between skilled workers' years of experience in a sector and wage growth.[21] We assumed that the relationship between experience and wage growth is similar to experience and productivity.

2.2 Economic modelling

Each of the impacts described in the preceding sections were calibrated to a national level and modelled in PwC's IFEM to estimate the economic impacts in terms of Gross Domestic Product and fiscal impacts from the cost of the policy as well as increased tax revenue and reduced welfare expenditure. Figure 3 briefly describes the different modules of the IFEM model.

Figure 3: PwC's Intergenerational Fiscal and Economic Model

The **economic impact** module is calibrated to the fiscal, macroeconomic and demographic projections and provides detailed economy wide impacts of tax changes.

It allows us to further decompose the impacts on economic outcomes such as GSP/GDP, prices and investment.

The **fiscal impact** module incorporates detailed historical state and commonwealth expenditure and revenue data, including the latest Budget 15-16 information.

Drawing from the demographic and macroeconomic projections, it provides detailed projections of state and Commonwealth expenditure and revenue, including transfers between states and Commonwealth.

This module allows us to develop a deep understanding and quantification of fiscal impacts of tax changes.

The **macroeconomic** module provides a consistent long run projection of state and national GSP/GDP, developed using a framework consistent with Commonwealth Treasury Intergeneration Report (IGR) framework.

This sets the backbone for fiscal and economic impact analysis.

The **demographic and household** module provides long run population projections consistent with ABS population projections. It provides a projection by age and overlays this with income and consumption profiles which will allow us to incorporate the impacts of ageing on consumption.

This module allows us to capture the impact of demographic trends on spending, generation of income and consumption taxes and expenditure pressures by income quintile.

Source: PwC

[21] Dustmann, C and Meghir, C. (2005), '*Wages, Experience and Seniority'*, University College London, Institute for Fiscal Studies and CEPR, November 2003

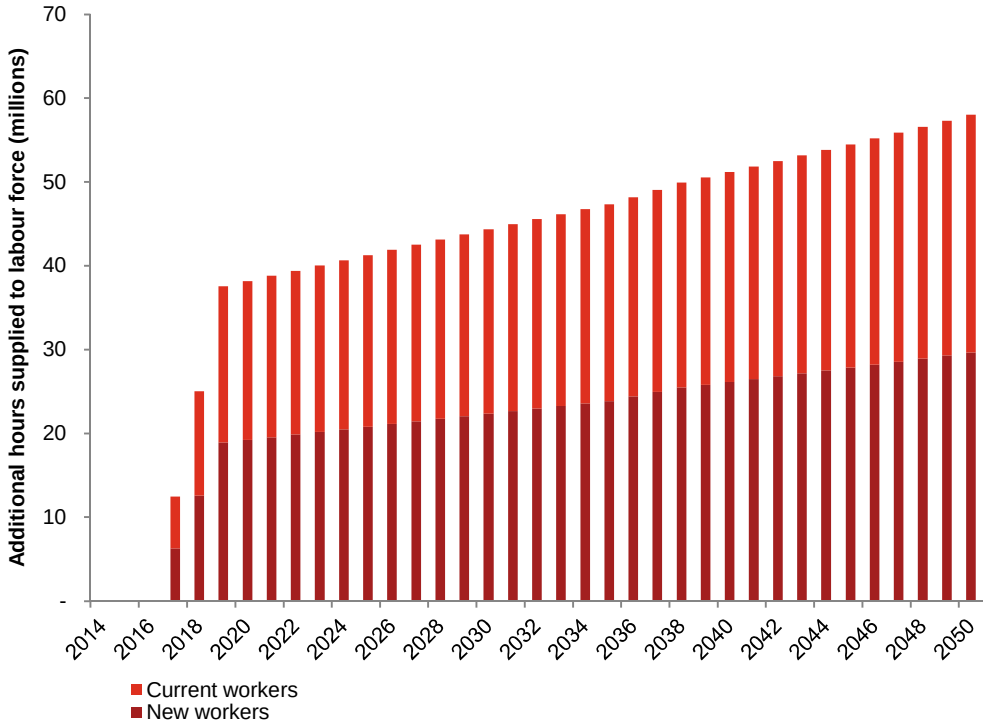
3 Results

The scale of the impacts on increased labour supply is shown in Figure 4. This is a combination of the estimated impacts on:

- those parents who are now willing to increase their hours of labour supplied because they can access more child care
- parents who are now willing to join the workforce and who were previously not in the workforce because the cost of child care made it unfeasible
- children aged 0-5 who receive ECEC as a result of their parents entering the workforce are more likely to enter the workforce in the future (this takes effect 19 years after entering ECEC)
- a productivity overlay has also been included for women and sole parents who are now able to enter the workforce earlier.

Figure 4 shows the effect of these four components on additional hours provided to the workforce. Our estimate of the effect of the CCS is that just over half of the increased hours would come from those who now choose to participate in the workforce. A significant portion of the economic impact would come from those who are already in the workforce.

Figure 4: Additional hours provided to the workforce

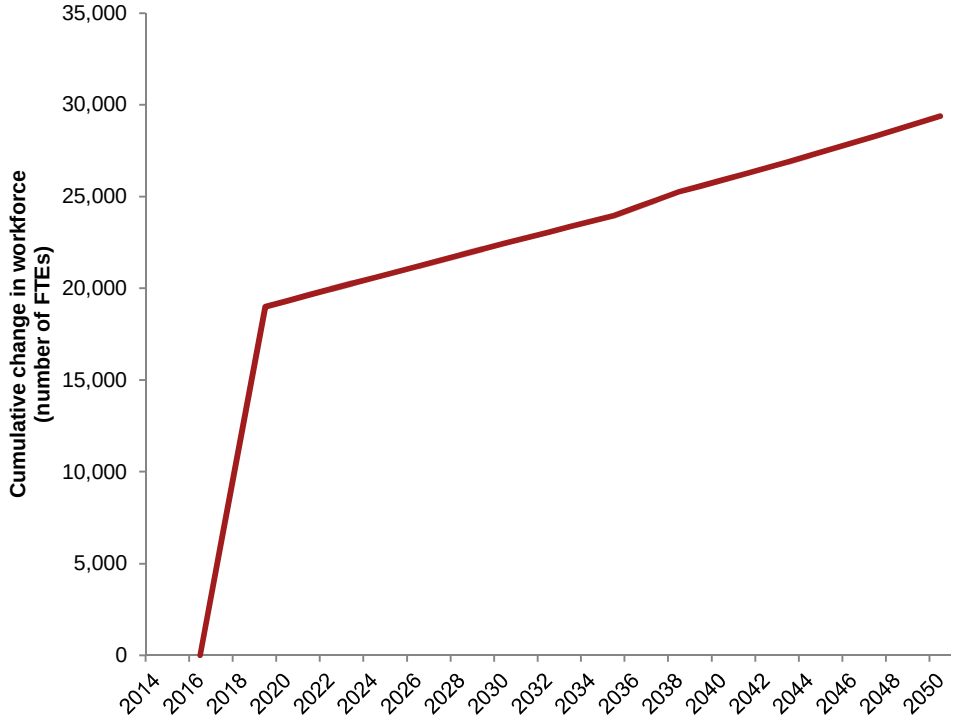


Source: PwC analysis

Combined, these different elements will add the equivalent of an extra 29,000 full-time equivalent (FTE) persons by 2050[22]. If expressed in terms of the number of average hours an employed person works per week (32.1 hours), this equates to 35,000 jobs. Currently there are approximately 11.4 million employed persons in Australia and this is forecast to grow to about 17.6 million people by 2050. While in the context of the total persons employed this increase appears small, it is still a significant impact affecting parents.

Assuming households take three years to respond to the changes, the employment impacts of the policy on these households results in an estimated 0.11 per cent increase in the labour force participation rate by 2019, when the effects of the policy are assumed to have fully taken effect.

Figure 5: Increase in number of persons in the workforce (in FTE positions)

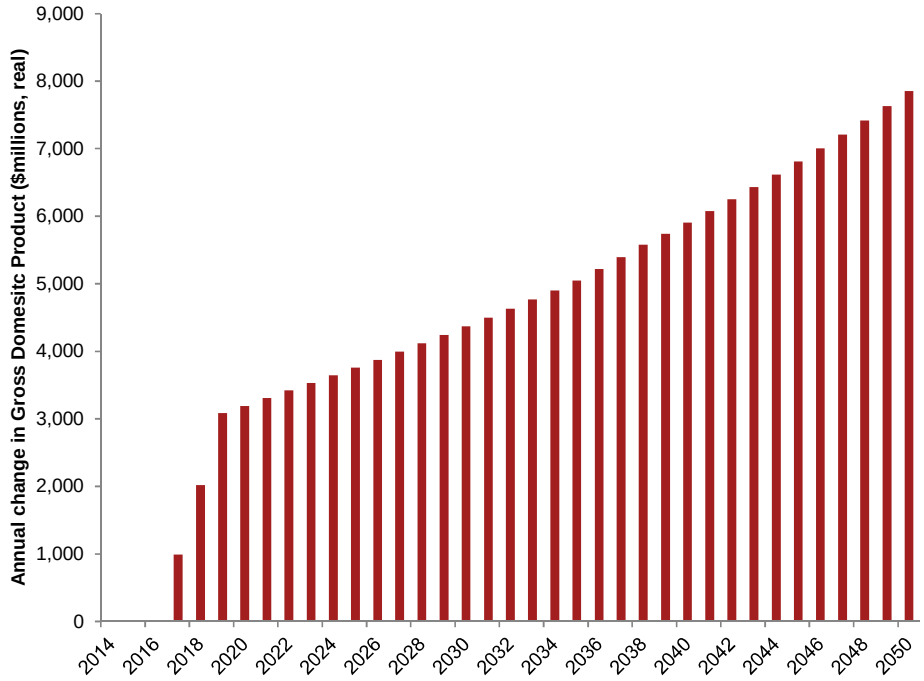


Source: PwC analysis

Figure 6 shows that the initial increase in parents in the workforce increases Australia's real GDP in 2019 by about $3.1 billion. In 2036, 19 years after the first cohort of children received greater access to ECEC, GDP increases slightly more. This contributes to an economy-wide impact of $7.9 billion in GDP in 2050.

[22] A full time equivalent position has been defined as a person working 7.6 hours a day – consistent with National Employment Standards as defined by the Fair Work Commission. The modelling by the Productivity Commission assumed a higher 8 hour day. See Productivity Commission, 'Modelling the effects of childcare policy changes', Technical supplement to the draft report: *Childcare and early childhood learning*, Canberra, October 2014, page 15.

Figure 6: Results of increased workforce participation impact on GDP



Source: PwC analysis.

The cost of providing ECEC to these children is estimated to total $1.2 billion in 2019 and $1.8 billion (in nominal dollars) in 2050. The cost of the policy comprised of the additional hours of child care demanded as well as the cost of increasing the subsidy on existing demand. This was estimated based on average hourly cost and average number of hours per week for children attending LDC, FDC and OSHC services.

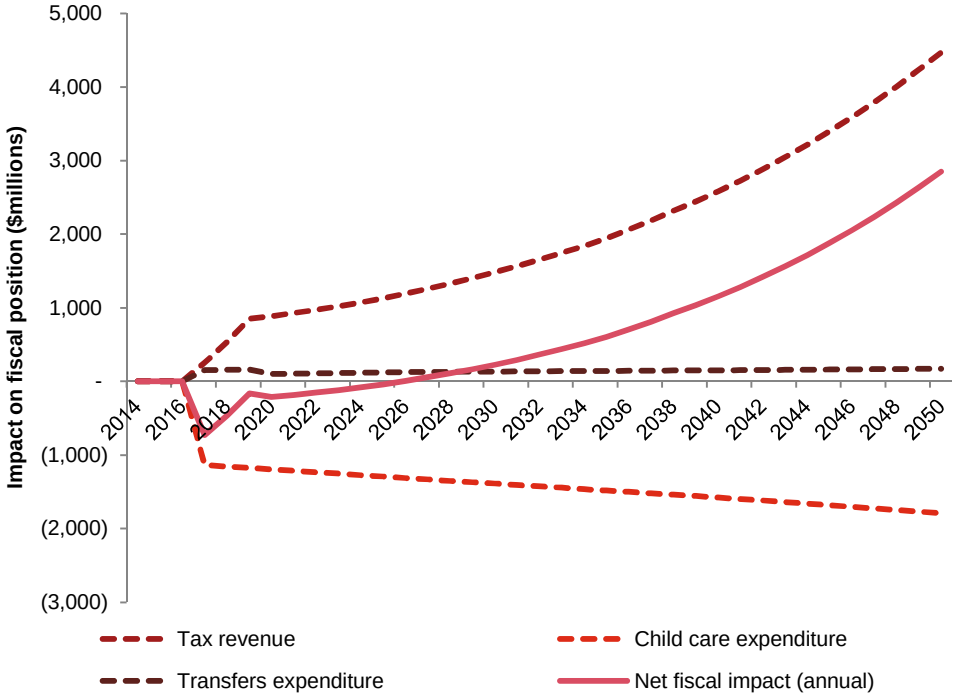
The cost of the policy, the increase in tax collection through additional employment, and the decrease in welfare payments, is shown in the following graph.

The increase in the number of people employed generates more income tax revenue and savings to the government in transfers such as family welfare payments.[23] The revenue and savings generated begins to outweigh the costs of the increase in access to ECEC in 2027 – see Figure 7. This translates into an overall breakeven point of 2035; at this point the net costs generated in previous years are offset by savings. This indicates that the policy results in an overall positive return to investment, generating an estimated $4.9 billion savings by 2050 (in net present value terms).[24]

[23] The estimated savings to welfare are less material than the increased tax revenue. Given the number of benefits available, the criteria for these transfers as well as the various different types of households and income levels, this analysis has taken a simplified approach. By considering the average level of welfare claimed by a household in a given income quintile and then considering the average income a parent who joins the workforce and works part time might experience, we have estimated the net change in welfare payments. A similar approach was also undertaken for households who already undertake formal care. Some levels of welfare increase with income levels while others decline. The net effect of this estimate is a small saving in welfare.

[24] A 5 per cent discount rate has been employed, consistent with the rates applied by the Australian Government in other social policy settings.

Figure 7: Fiscal results of increased workforce participation impact



Source: PwC analysis.

4 Future steps

As the analysis undertaken is a broad estimate of the impacts of the policy, we have several recommended further steps that should be undertaken to ensure a robust and considered estimate of the policy outcome.

- ***Review of the child care services sector***: In our analysis, we have not considered whether the child care sector in its current state is equipped for the growth in demand due to the subsidy. This includes both staff resources and the land and infrastructure required to meet the increased demand. This may result in significant costs to government to increase supply. Alternatively, limited supply may result in a higher level of inflation than historical trends suggest, resulting in a less efficient outcome than estimated. An increase in the number of children attending child care will also increase the proportion of special needs children requiring additional resources. The review will highlight whether current systems can adequately support these children.

- ***Inclusion of the impacts of increased voluntary work***: Our analysis accounted for the impacts of employment of coupled women, sole parents and children later in life. It does not consider parents who would subsequently access child care for their children to undertake voluntary work. This is also likely to generate economic benefits, which are not included in this analysis.

- ***Behavioural analysis***: We have based our estimated change in employment on Breunig and Gong (2012), which considers the impact of a broad price change. In practice, peoples' responses to the activity test, subsidy and subsidy cap are likely to be less rational. For example, while the PC's report[25] finds that the overall effect of an activity test is positive on labour supply, the study also finds there are subsets of the population that will increase labour supply and concurrently demand less child care.

[25] Productivity Commission, 'Modelling the effects of childcare policy changes', Technical supplement to the draft report: *Childcare and early childhood learning*, Canberra, October 2014, page 23.

Appendices

Appendix A Methodology and technical notes

This section provides an overview of the methodology and documents the key assumptions made in the modelling. It also sets out some limitations of the approach.

1 Overview

This scenario analyses the immediate impacts on the Australian economy of an increase in the labour force participation rate that may result from increasing access to affordable, quality child care for parents of children aged up to 12 years old. In particular, the scenario models the assumed impacts of the Australian Government's proposed Child Care Subsidy, which is expected to reduce the out of pocket cost of child care. It assumes an increase in access to child care enables more parents (mainly women) to join the workforce, which increases their experience and therefore productivity.

Our analysis has been limited to the number of partnered mothers and sole parents who may join the workforce. We acknowledge that this analysis could be extended to partnered fathers, or other carers who may also join the workforce as a result of increased access to child care. However, carers who are not participating in the labour force or are not able to increase their participation in the labour force due to cost or access to child care account are mostly mothers. According to the Productivity Commission, mothers account for more than 90 per cent of carers that are prevented from either working or working longer hours due to a lack of child care and this is even higher for those parents not in the labour force.[26]

We have also modelled the impact of increasing the number of children attending child care and the expected impact that will have on their employment when they join the workforce, (that, through receiving more education, children are more likely to be employed when they are of working age) while accounting for the immediate costs involved in having extra children participating in ECEC.

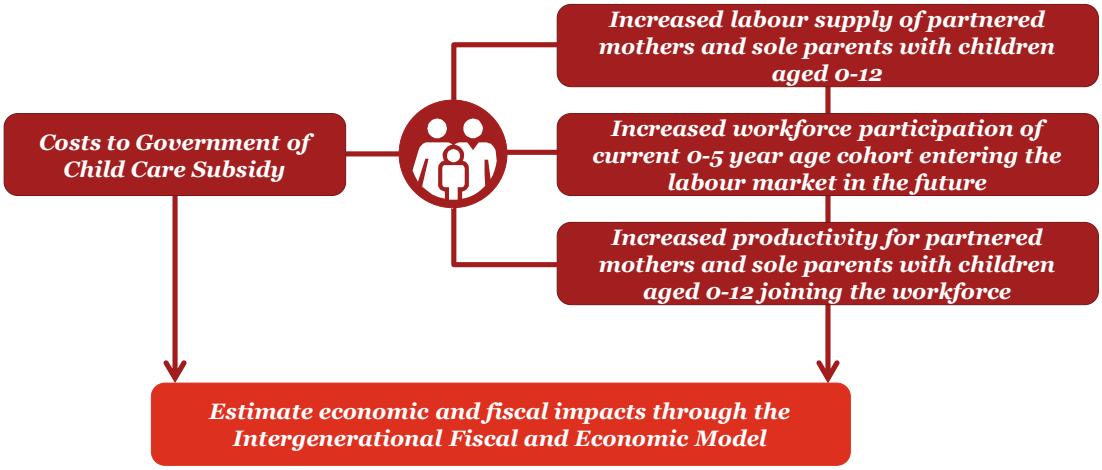
The details of these different components of the methodology are set out below.

2 Methodology

Figure 8 describes the methodology at a high level. These points are described in further detail below.

[26] Productivity Commission, *Childcare and Early Childhood Learning*, Inquiry Report No. 73, Canberra, 2014, page 841

Figure 8: Overview of components to modelling



Source: PwC

We explored three key positive impacts, the method for which is described below. This is followed by our approach to estimating the cost of the policy, and wider economic and fiscal impacts.

Increased labour supply of partnered women and sole parents with children aged 0-12

In measuring the number of additional hours supplied to the labour force as a result of the increased childcare subsidy, we take into consideration two factors; increased labour supply from access to child care and the types of families affected by the policy.

Increased labour supply from access to child care

We determined the number of parents who would subsequently enter the workforce or increase their hours of work by employing the findings from Breunig and Gong (2012)[27] and Doiron and Kalb (2005)[28], two studies that the PC's 2015 Inquiry into Childcare and Early Childhood Learning builds its childcare model on.[29]

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[27] Xiaodong Gong and Robert Breunig, 'Child care assistance: Are subsidies or tax credits better?', *Institute for the Study of Labor*, Discussion paper no. 6606, May 2012.

[28] Denise Doiron and Guyonne Kalb, 'Demands for child care and household labour supply in Australia', *The Economic Record*, Volume 1, No. 254, September 2005, pp. 228.

[29] Productivity Commission, 'Modelling the effects of childcare policy changes', Technical supplement to the draft report: *Childcare and early childhood learning*, Canberra, October 2014, page 3.

The Breunig and Gong (2012) paper finds that the net price elasticity of hours of work for mothers with preschool children is -0.10. Breunig and Gong's paper focused on the cohort of partnered mothers (either married or in a de facto relationship) of working age (younger than 65) with at least one young child (0 to 5 years old who are not yet at school). In the context of this cohort, this elasticity is interpreted as meaning a one per cent increase in the net childcare price leads to a 0.10 per cent decrease in the hours of work of partnered mothers with a child aged 0-5 years. Furthermore, the paper finds that the net child care price elasticities of employment for partnered women with young children is 0.06 per cent. This suggests that a one per cent increase in the net child care price results in a 0.06 per cent decrease in employment of partnered women with a child aged 0-5 years.

Doiron and Kalb (2005), incorporates sole parents and partnered parents in their research on the elasticities for child care. This shows that a 10 per cent increase in the net cost of child care for lone parent families with children aged less than 5 years old leads to a 2.8 per cent decline in expected hours of labour supply, hence an elasticity of -0.28.[30]

The difference between the number of additional hours generated through an increase in subsidy, and the number of additional women joining the workforce multiplied by median hours worked by women with children in child care, provides the number of additional hours worked by women currently employed who work longer hours due to the increased subsidy.

Table 3 summarises the elasticities used in the analysis.

Table 3: Elasticities applied in the estimation of increased labour supply for partnered and sole parent households with children aged 0-12

Description	Value	Source
Couple parents' net child care price elasticity on hours worked	0.10 per cent	Gong and Breunig (2012)
Couple parents' net child care price elasticity on employment	0.06 per cent	Gong and Breunig (2012)
Sole parents' net child care price elasticity on hours worked	0.28 per cent	Doiron and Kalb (2005)

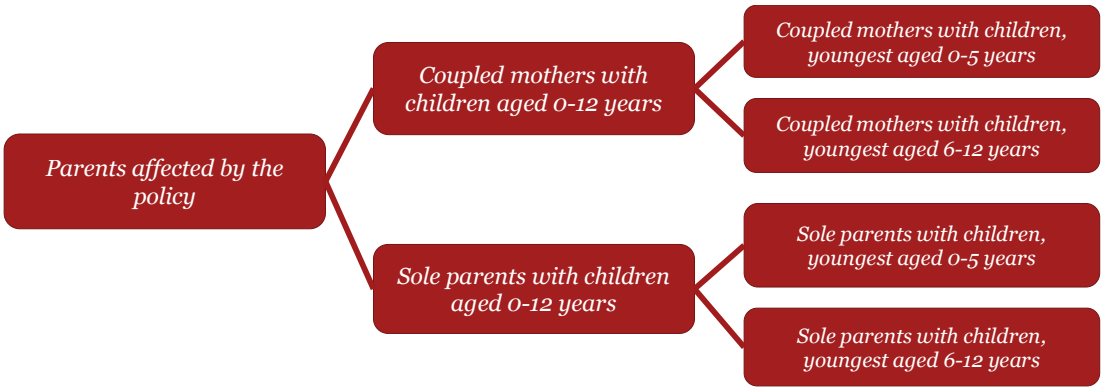
Source: PwC

Parents affected by the policy

To consider the different needs of types of households, our analysis is broken up into four categories of parents affected by the policy (see Figure 9).

[30] Denise Doiron and Guyonne Kalb, 'Demands for child care and household labour supply in Australia', *The Economic Record*, Volume 1, No. 254, September 2005, pp. 228.

Figure 9: Types of households affected by the Child Care Subsidy



In doing so, we analyse the different characteristics of each type of household:

- *Coupled mothers with children, youngest aged 0-5 years:* The impact of a change in net price of child care on coupled mothers is lower than for sole parents, as there is likely to be another source of income. Children aged 0-5 years are likely to require longer hours of child care, through either long day care or family day care.

- *Coupled mothers with children, youngest aged 6-12 years:* Relative to the above, children aged 6-12 years tend to have less weekly hours of child care as this only includes before and after school care.

- *Sole parents with children, youngest aged 0-5 years*: As sole parents are likely to rely on a single source of employee income, their net price of child care elasticity is greater than for coupled parents.

- *Sole parents with children, youngest aged 6-12 years*: The characteristics of this group are similar to coupled mothers with children, youngest aged 6-12 years. This is because children aged 6-12 spend most of their day at school, and the overall need for before and after school care is therefore more elastic than for other types of formal care.

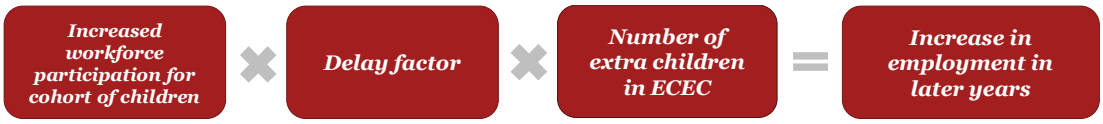
Australian Bureau of Statistics (ABS) data shows that there were over 2.2 million households with children aged 0-12 years in 2013-14. Within these households, there are over 1.7 million couple families and 356,000 single parent families.[31] [32] Assuming households take three years to respond to the changes, the employment impacts of the policy on these households results in an estimated 0.11 percentage point increase in the population participation rate by 2019, when the effects of the policy are assumed to have fully taken effect.

[31] Australian Bureau of Statistics, *6523.0 Household Income and Wealth, Australia, 2013-14,* Released 4 September 2015, Table 14.2 Child care use, Household characteristics, Households with children aged 0-12 years.

[32] The remaining includes multiple family households, which are not included in our analysis.

Increased workforce participation of current 0-5 year age cohort entering the labour market

Figure 10: Approach to calculating increased employment for children



Increased workforce participation for cohort of children

There are many studies that suggest ECEC positively influences a child's development, in particular on their learning and socio-emotional development.[33] Better educational performance attained through attending child care is estimated to improve the likelihood of these children becoming employed later in life. As such, we have modelled the benefits of child care to the children aged 0-5 who are able to access childcare as a result of the policy.

This draws on the PC's 2006 report on the Potential Benefits of the National Reform Agenda, which cited the High/Scope Perry Preschool and the Abecedarian projects. These studies noted that disadvantaged children receiving ECEC are between 14 per cent and 18 per cent more likely to be employed.[34] Noting the vast differences between the US, in particular the High/Scope Perry Preschool cohort, and the general Australian ECEC context, we have taken the lower end of this range and discounted by 75 per cent, to 3.5 per cent.

This percentage is applied as an improvement to the likely proportion of children who would be employed.

Delay factor

The delay factor is based on ABS Labour Force data, which suggests that in 2015, 58 per cent of 15-24 year olds were employed. Taking a conservative estimate by assuming that unemployment lies in the younger proportion of the age bracket, this implies that on average, people enter employment at 21 years old. Further, if we assume that the average age of children in ECEC is 2 years, we can estimate a delay factor of 19 years between undertaking formal care and entering employment.

Number of extra children in ECEC

To estimate the number of additional children accessing ECEC as a result of the policy, we utilised Breunig and Gong's (2012)[35] study. The study finds that for coupled families with children aged 0-5 years, the elasticity of the use of formal care relative to the net price of child care was -0.129 per cent. This elasticity was adapted for the different types of households using ABS data on the number of households that use formal care or a combination of formal and informal care.[36]

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33 Houng, B., Jeon, S., and Kalb, G., *'The effects of childcare on child development'*, Melbourne Institute of Applied Economic and Social Research, May 2011, p. 63,

34 Productivity Commission, *Potential benefits of the national economic reform agenda,* Report to the Council of Australian Governments, Canberra, 2006, p 239.

35 Ibid.

36 Australian Bureau of Statistics, *6523.0 Household Income and Wealth, Australia, 2013-14,* Released 4 September 2015, Table 14.2 Child care use, Household characteristics, Households with children aged 0-12 years.

In our analysis, we assume that only children aged 0-5 years receive significant benefits from child care. This assumption was made based on the number of hours of formal care children aged 0-5 years receive relative to children aged 6-12 years. The two studies cited relate to preschool age children, and as such children aged 6-12 years were not included in our analysis.

In the base case, 42.9 per cent of coupled families with children aged 0-5 years used formal care, or a combination of formal and informal care.[37] This is relative to 36.56 per cent of sole parent families with children aged 0-5 years.[38] The difference is likely to be due to the income difference of coupled families compared to sole parent families.

Increased productivity for parents with children aged 0-12 years joining the workforce

Our literature review suggests that there is a positive relationship between years of work and wage growth. For partnered women and sole parents who are now entering the workforce earlier than they otherwise would have, they are gaining extra experience in the workforce, and therefore boosting wage growth. We have used wage growth as a proxy for productivity, as wages tend to adjust based on how efficiently people are able to perform.

A study by Dustmann and Meghir (2005)[39] finds that for unskilled workers finding new jobs after displacement, experience can influence by between 0.087 per cent (1 year experience) to 0.015 per cent (5 years' experience). Note that the wage increases are compounded based on experience (ie 5 years' experience provides a 0.015 per cent increase on the 4 years' experience increase). For skilled workers finding new jobs after displacement, annual wage growth ranges from 0.067 per cent (2 years' experience) to 0.022 per cent (5 years' experience).

Based on this study, we modelled the productivity benefits to parents of an additional two years' work experience, where two years is the average amount of time children are in formal care. Scaling the productivity benefits to the total population, we derived an economy-wide productivity shock to implement in the IFEM.

Cost to government of the Child Care Subsidy

We estimated the cost to government as a function of increased subsidy on existing hours of child care and cost of additional hours of child care undertaken due to the subsidy.

Many families currently using child care will receive an increased subsidy due to the policy. To estimate the cost to the Government of increased subsidy on existing demand, we used the actual number of children aged 0-12 enrolled in at least one type of approved care service as reported on a quarterly basis by the Department of Social Services.[40] We further estimated the number of children undertaking child care by age group, assuming that children aged 0-5 undertook LDC and FDC, while children aged 6-12 undertook OSHC. With this information, we estimated the cost to Government by using:

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37 Xiaodong Gong and Robert Breunig, 'Child care assistance: Are subsidies or tax credits better?', May 2012, Table 1. Sample statistics.

38 Australian Bureau of Statistics, *6523.0 Household Income and Wealth, Australia, 2013-14*, Released 4 September 2015, Table 14.2 Child care use, Household characteristics, Households with children aged 0-12 years

39 Dustmann, C and Meghir, C., *'Wages, Experience and Seniority'*, University College London, Institute for Fiscal Studies and CEPR, November 2003

40 Department of Social Services, *'Early Childhood and Child Care in Summary'*, June quarter 2014

- the average hours of each type of child care undertaken – 28 hours for LDC/FDC/OC and 11 hours for OSHC[41]
- the average costs per hour of each type of child care - $7.96 for LDC/FDC/OC[42] and an estimated $6.35 for OSHC[43]
- the change in subsidy rate – the weighted average subsidy from 64 per cent to 71 per cent.

The additional hours of child care for children aged 0-5 years and 6-12 years was estimated using the additional number of children approximated earlier in the report, multiplied by the average number of hours of LDC/FDC/OC and OSHC. The additional hours were subsequently translated into cost to government using the average cost of LDC/FDC/OC and OSHC.

Economic impacts

The Gross Domestic Product (GDP) impacts and fiscal impacts were considered using PwC's Intergenerational Fiscal and Economic Model (IFEM). The IFEM is able to capture the immediate and longer-run benefits to the economy from increasing the subsidy of child care. The IFEM can measure changes against the base case or current policy settings. The approach provides a fully integrated set of estimates spanning the dynamic impacts on industry, households, government finances and the wider economy. This is illustrated in the following diagram.

Figure 11: PwC's Intergenerational Fiscal and Economic Model

The **economic impact** module is calibrated to the fiscal, macroeconomic and demographic projections and provides detailed economy wide impacts of tax changes.

It allows us to further decompose the impacts on economic outcomes such as GSP/GDP, prices and investment.

The **fiscal impact** module incorporates detailed historical state and commonwealth expenditure and revenue data, including the latest Budget 15-16 information.

Drawing from the demographic and macroeconomic projections, it provides detailed projections of state and Commonwealth expenditure and revenue, including transfers between states and Commonwealth.

This module allows us to develop a deep understanding and quantification of fiscal impacts of tax changes.

The **macroeconomic** module provides a consistent long run projection of state and national GSP/GDP, developed using a framework consistent with Commonwealth Treasury Intergeneration Report (IGR) framework.

This sets the backbone for fiscal and economic impact analysis.

The **demographic and household** module provides long run population projections consistent with ABS population projections. It provides a projection by age and overlays this with income and consumption profiles which will allow us to incorporate the impacts of ageing on consumption.

This module allows us to capture the impact of demographic trends on spending, generation of income and consumption taxes and expenditure pressures by income quintile.

Source: PwC

41 18 hours is an average of the median for LDC and FDC, weighted by the number of children attending each type. Source: Australian Bureau of Statistics, *4402.0 Childhood Education and Care, Australia, June 2014*, Released 28 April 2015, Table 8 Type of care: Care usually attended—By weekly hours of care, Children aged 0–12 years who usually attended care.

42 Productivity Commission, Report on Government Services, Chapter 3: Childcare education and training, 2014, Figure 3.12.

43 This estimate is based on the relative differences between the benchmark hourly rate allowed for in the proposed CCS for LDC/FDC and OSHC. This proportional difference was then applied to the average hourly rate for LDC and FDC. Source: http://www.budget.gov.au/2015-16/content/bp2/html/bp2_expense-20.htm Accessed 21 October 2015.

Employment impacts

In our analysis, employment is impacted by the policy in two ways:

- Increase in the number of coupled women and sole parents joining the workforce or those who are already in the workforce, increasing their hours of labour supplied.
- Increase in number of children 0-5 joining the workforce later in life.

The increase in people joining the labour force is translated into an increase in total participation rate of the economy. The IFEM assumes the increased supply of labour becomes employed at an appropriate rate, meaning employment does not suddenly increase as a result of the policy, but at a more gradual pace. We have also assumed 5.5 per cent of the increased numbers of workers in the labour force are unemployed, which reflects a long run 'full employment' unemployment rate of 5 per cent and an unemployment rate that is currently above this long run rate.

GDP impacts

Using the IFEM, we estimated the overall economic impact of the policy based on the increased participation rate, as well as the productivity benefits gained from coupled women and sole parents joining the labour force earlier.

In modelling GDP, several assumptions were made:

- Capital is not constrained, and increases as labour increases. This is consistent with the PC's assumption in their child care modelling.[44]
- Long run economic impacts are based on an intergenerational economic framework consistent with Commonwealth Treasury Intergenerational report approach.
- The impact of the 'shocks' on the economy relies on historical trends of productivity and labour force growth, and its historical impact on GDP.
- In the first few years, more parents will join the labour force, but employment adjusts gradually.

Fiscal impacts

Fiscal impacts were calculated taking into consideration three key factors:

- government expenditure for the policy (the cost of the policy, described above)
- additional tax revenue generated
- reduced welfare benefits.

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44 Productivity Commission, 'Modelling the effects of childcare policy changes', Technical supplement to the draft report: *Childcare and early childhood learning*, Canberra, October 2014, page 15.

Government expenditure is taken directly from the cost of the policy calculated in Section 3 Results. Additional tax revenue is estimated based on the baseline ratio of revenue to nominal GDP, applied on the policy nominal GDP.

Several assumptions were made in calculating the savings to the Government of reduced welfare benefits. These include:

- The additional parents entering the workforce and the existing users of child care are evenly spread among the quintiles eligible for the subsidy.
- The average amount of welfare benefits received by individuals in each quintile is the average of the quintile as reported by the ABS.[45]
- Welfare benefits include all social security and welfare benefits and social assistance benefits in cash, aside from unemployment benefits (as we assume these individuals were not in the labour force). While some benefits may be less affected by the policy, for the purposes of this analysis we have taken an average and assumed all benefits are equally impacted.
- Changes in income are based on Breunig and Gong's (2012) net price elasticity of child care on employment (0.06 per cent change for every per cent change in price).
- Only the welfare savings generated from movements across quintiles are considered.

3 Limitations

The following limitations are noted in the above approach. Future work could consider addressing or incorporating these elements.

- Estimating the increased employment demand for those in the ECEC profession – there could be increased demand for child care professionals to facilitate the increased demand for child care services. The flow on impacts of this could include increased demand for training of ECEC workers and increased income tax for example.
- There may be additional Government costs to expand the Australian child care services sector. These have not been considered in our analysis.
- The GDP impact of parents entering voluntary work as a result of the child care subsidy has not been estimated.
- The elasticities applied in this analysis may be different given the cohorts they are based on relate to a different time period.
- Children aged 6-12 are likely to receive some educational benefits from out of school care. These have not been included in this study.
- The net fiscal savings may be higher due to the regulatory costs associated with the CCS as outlined in the Regulatory Impact Statement for the Child Care Assistance Package.[46]

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45 Australian Bureau of Statistics, *6523.0 Household Income and Wealth, Australia, 2013–14*, Released 4 September 2015, Table 6.5 Income, government benefits and taxes, gross income quintiles.

46 http://www.earlychildhoodaustralia.org.au/wp-content/uploads/2015/06/RIS-for-the-Child-Care-Assistance-Package.pdf Accessed 26 October 2015.

- The activity test and subsidy cap aspects of the Child Care Subsidy have not been considered in this analysis. Adjustments to the proposed Child Care Subsidy that were announced in late 2015, including a lower subsidy level at higher income thresholds, were also not included in this analysis.

- Other elements of the Families Package such as the Nannies Trial and the Government's proposed changes to Family Tax Benefits A and B may also have some impacts on the use of child care and participation in the workforce.

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