THE NEW NATIONAL QUALITY FRAMEWORK: QUANTIFYING SOME OF THE EFFECTS ON LABOUR SUPPLY, CHILD CARE DEMAND AND HOUSEHOLD FINANCES

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THE NEW NATIONAL QUALITY FRAMEWORK: QUANTIFYING SOME OF THE EFFECTS ON LABOUR SUPPLY, CHILD CARE DEMAND AND HOUSEHOLD FINANCES

Robert V. Breunig¹, Xiaodong Gong² and Declan Trott³

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¹ Corresponding author: Robert.Breunig@anu.edu.au, Research School of Economics, Australian National University, Canberra ACT 0200, Australia.
² The National Centre for Social and Economic Modelling, University of Canberra
³ Research School of Economics, Australian National University
Abstract

New regulations to improve the quality of early childhood education and care will come into force in Australia in 2012. Using a simultaneous, structural model of labour supply and child care demand we predict the effects on the labour supply of partnered women, on demand for child care and on household finances for partnered households in Australia. Using estimated cost impacts of this new National Quality Framework from government and non-government sources, we find modest effects on household behaviour. For a mid-range cost scenario, we find that partnered women's labour force participation will decrease by just over one half of one percentage point, a change of less than one per cent. Working hours for partnered women decrease by 20 minutes or about 2 per cent. Household disposable income decreases by $12.50, a 0.6 per cent decrease. Given widespread agreement about the benefits of investing in children, these quantitatively small effects strengthen the case for the National Quality Framework.

1 Introduction

In December 2007, the Commonwealth Government of Australia and state and territory governments, through the Council of Australian Governments (COAG), partnered to pursue reform in the areas of early childhood care and education and early childhood development. (See The Commonwealth of Australia (2007)). A key component of the proposed reform agenda was a commitment to develop and implement improved quality standards for early childhood education and care in Australia.

Subsequently, at their December 2009 meeting, COAG agreed to a new National Quality Framework (NQF) for early childhood education and care (ECEC). The communiqué from the meeting, see The Commonwealth of Australia (2009a), states:

COAG signed a landmark agreement to drive higher quality early childhood education and care. Giving children the best possible start in life provides the foundation for better education in school and later in life, and delivers long-term social benefits. The National Quality Agenda for Early Childhood Education and Care will create new quality standards, including higher staff to children ratios and better trained carers and early childhood teachers with requirements phased in over the next decade. Through a new ratings system, parents will be given better information on the quality of childcare services so that they can make the best decisions for their children. Childcare providers will benefit from streamlined regulatory arrangements that cut red tape.

The reforms in the framework are targeted to improve educational and social outcomes for children attending long day care, family day care, outside school hours care and preschool. There are three main components. The first component is to improve interactions between children and carers through better qualified staff and lower staff-to-child ratios. The reforms are also intended to harmonise early childhood education and care standards in areas of staffing, health and safety and physical environment across all states and territories in Australia. Finally, the reforms propose a new, transparent ratings system which will provide parents with better information to compare child care and education providers.

There is widespread and growing agreement amongst both medical and social scientists about the importance of early childhood development in a whole range of social, psychological, health, and economic outcomes. (For example, see McCain, Mustard and Shanker (2007), Currie (2009), Heckman and Masterov (2007) and Irwin, Siddiqi and Hertzman (2007)). The consensus view from this literature is that it makes sense to invest in young children both from the point of view of realising a society's full potential and from the point of view of minimising inequality. Some economic policies present us with a trade-off between growth and equality; investing in children appears to be a win-win situation. An accessible overview of this literature is provided in Appendix 1 of The Commonwealth of Australia (2009b).
Implementing the NQF will require hiring more staff per children, providing more educational training for those staff and improving physical space and safety standards. More staff means higher costs at day care centres; someone will have to pay for more education; more-educated staff will command a higher salary and upgrades to safety and physical space require funds. To at least some degree, all of these costs will flow through to higher prices for child care whether it be in a long day care centre, a preschool, at a family day care provider or in some type of before or after school care.

In this paper we address four questions. How will the increased costs affect:
> women's labour force participation?
> the amount of child care demanded by households?
> household budgets?
> government expenditure?

We focus on couple-headed households and specifically on women's labour force participation in these households. We refer to ‘married’ women to include both those in legal marriages and those in de facto relationships. We focus on married women because they are the group whose labour supply is most responsive to the presence of children in the household and to the costs associated with children, see Kalb (2002).

The basic framework of our analysis builds upon a standard labour economics approach (eg Killingsworth (1983) and Van Soest (1995)). Married women evaluate the benefits of working against the costs of working and choose whether or not to work and how many hours to work on the basis of that tradeoff. The benefits of working include pecuniary benefits (additional consumption afforded by the additional wage income) as well as non-pecuniary benefits (feelings of self-worth, social connectedness). The costs of working include decreased time available for home production and leisure. If working requires placing children into paid child care of one type or another, then the costs of child care also add to the costs of working. Implementing the NQF will raise costs and at least some of this increased cost will be reflected in increased child care prices. These increased prices will be partially offset by government subsidies such as the Child Care Benefit (CCB), Child Care Rebate (CCR) and Jobs Education and Training Child Care Fee Assistance (JETCCFA). As the costs of child care go up, the increased costs of working for married women may lead some women to work less and some women to stop working altogether. This paper will attempt to quantify those effects for a range of different cost/price scenarios.

To preview the results, we find negative and statistically significant effects on women’s labour supply and on household budgets across all of the cost scenarios that we consider. Furthermore, we find that these effects are relatively small. Given the widespread agreement about the importance of investing in children and the potential long-term benefits of the NQF, the fact that the effects are quantitatively small would seem to strengthen the case for the NQF.

In the next section we review the details of the NQF. We then discuss our approach to estimating the effect of child care costs on married women’s decisions about how much to work and whether or not to work. In the fourth section we present six different scenarios for child care fee changes and their effects on married women's labour supply. Our cost scenarios are drawn from Access Economics (2009), industry sources and media reports about the NQF. We conclude in the final section and discuss some of the caveats to our conclusions.
2 The National Quality Framework

The new National Quality Framework (NQF) (which forms part of the broader National Quality Agenda (NQA) for Early Childhood Education and Care)\(^1\) is formulated against the following backdrop:

> the importance of early childhood development for future individual well-being
> the importance of quality early childhood education and care in supporting workforce participation for families of all types
> the problem of varying quality across early childhood education and care services which currently prevails
> the existence of complex administrative and regulatory arrangements across states and childcare types
> the existence of layers of state and Commonwealth bureaucracy relating to childhood care and education
> a lack of information that families can use to make informed decisions about quality and availability of child care and education.

The National Quality Agenda seeks to address these issues by:

> raising standards for early childhood education and care and harmonising them across states and territories
> publishing a quality rating system which families can use to assess their childhood care options
> introducing streamlined regulatory arrangements.

In this paper, we focus on the increased costs which will arise from the NQF and the effect that these increased costs might have on workforce participation decisions of married mothers. The main cost factor arising from the NQF is the salary costs associated with paying for more and higher educated staff. Specifically, the NQF proposes moving to a national standard for staff-to-child ratios in preschools and long day care centres of:

> 1:4 staff-to-child ratio for 0-24 month-olds effective from 1 January 2012
> 1:5 staff-to-child ratio for 25-35 month-olds effective from 1 January 2016
> 1:11 staff-to-child ratio for children older than 35 months effective from 1 January 2016.

These changes do not affect all states equally. Victoria already requires a staff-to-child ratio of 1:4 for 25-35 month-olds and this stricter standard will remain in place for Victoria. New South Wales, Western Australia and Tasmania already require a 1:10 staff-to-child ratio for children older than 35 months and these stricter requirements are not superseded by the NQF standards. Also, family day care will be required by the NQF to have staff ratios of at least 1:7 with a maximum of 4 children not attending school.

The NQF will also raise required minimum educational qualifications of staff working in the early childhood education and care sector. For family day care (FDC), long day care (LDC) and preschools, by 1 January 2014:

> A degree qualified early childhood teacher will need to be in attendance all of the time when LDC and preschool services are being provided to 25 children or more, and some of the time when services are being provided to less than 25 children.
> Within each LDC centre or preschool, half of all staff will need to have (or be actively working towards) a diploma-level ECEC qualification or above, and the remaining staff will all be required to have (or be actively working towards) a Certificate III level qualification, or equivalent.
> All FDC coordinators will need to have a diploma-level qualification or above.
> All FDC carers will be required to have (or be actively working towards) a Certificate III level qualification, or equivalent.

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Also, by 2020, the NQF requires a second early childhood teacher, or another suitably qualified leader, to be in attendance all of the time when LDC and preschool services are being provided to more than 80 children, and at least half of the time when services are being provided to between 60 and 80 children.

Access Economics (2009) states that ‘labour costs represent-ing up to 70% of services’ total operating costs...’ (page 51). Anecdotally, we spoke with several long day centres in Canberra including the largest one, and staffing costs make up sixty to ninety per cent of their current operating costs. It thus seems clear that the main costs of the NQF will relate to hiring more and better trained staff.

Our focus in this paper is on cost and a review of the lengthy international literature on the benefits of investing in children is beyond the scope of this paper. Access Economics (2009) discusses in some detail the kind of benefits that one might expect from improved childhood outcomes, a streamlined regulatory system and a quality rating system. We refer the interested reader to that report, the references in the introduction and Appendix 1 of The Commonwealth of Australia (2009b).

An analysis of the effect of quality is also beyond the scope of this paper. As we discuss in section 4 below, we have no way to evaluate what the impact will be on demand for child care and women’s labour supply from improved quality of childhood care and education.

Our conclusions here are intended to provide richer input into a discussion of the costs and benefits of the NQF. Our focus on cost should not be interpreted as an implicit statement that the costs are larger than the benefits nor that the benefits are unimportant. It is in the area of costs where our previous research permits us to provide a concrete contribution.

3 Married women’s labour supply and the cost of child care: Modelling, estimation and data

In this section we discuss the main features of our model and highlight the major research contributions which we have made. We then briefly indicate how the model is estimated and describe the data that we use.

3.1 The economic model

We highlight seven key aspects of the economic model and approach which we have developed to analyse this question:

1. We simultaneously model demand for child care and married women’s decisions about whether or not to work and how much to work.
   This is important because it allows child care to be used for other purposes besides simply freeing up time for mothers to work.

2. Using more detailed data than has been previously available, we construct local child care prices for each Labour Force Survey Region.
   This is important because it allows us to identify a price of child care that represents the approximate average price that women must pay to send their children to child care in order to work. This price removes, to at least some degree, the variation in price which we observe across families that is driven by different choices of child care quality.

2 The research which we summarize in this section has been the product of multiple collaborations over several years. The original work which provides the background to this section appears in working paper and journal format in Gong, Breunig and King (2010b), Gong, Breunig and King (2010a), Breunig, Gong, Mercante, Weiss and Yamauchi (2011), Gong, Breunig and King (2011) and Gong and Breunig (2011a). We refer interested readers to these papers for the technical details.

3. We assume that married women choose working hours and hours of child care for their children from those points which are commonly observed in the data. This makes the model realistic. Women cannot choose to work any amount of hours they want, but must choose from those offered by employers—35 hours, 20 hours, etc.—which are commonly observed in the data. Likewise, when children are enrolled in a child care centre, hours choices are generally restricted and households must choose a full week, full days, half-days, etc. Hours cannot be adjusted in arbitrarily small amounts but must respect the real-life constraints of the labour market and slots typically offered by child care providers.

4. The model includes constraints which require that children be cared for at all times by someone other than the mother while the mother is working. Although this may seem obvious, much of the previous empirical literature in this area does not formally integrate such constraints into model estimation. Such constraints are important to avoid bias in the estimated effects of child care prices. (See Duncan, Paul and Taylor (2001)).

5. The model allows hours worked by the mother to exceed hours of formal child care, with the difference being made up by informal and/or paternal care. This relaxation of hours restrictions imposed in previous research is important in that we observe in the data that over thirty per cent of working mothers work more hours than their children are in formal care. Again, this is intuitively appealing but the only previous papers that have imposed hours constraints have required that formal hours of child care are greater than or equal to hours worked by the mother. In the data, we observe that this type of restriction is violated in almost one-third of households.

6. We model and include effects of the personal tax system and major transfer payments including New Start Allowance, Parenting Payment Partnered, Family Tax Benefits, Child Care Rebate and Child Care Benefit.

7. The model allows us to estimate net price elasticities. Net price elasticities are essential to evaluate policy changes because they reflect families’ responses to changes in the actual out-of-pocket costs which they must pay for child care. Any policy which changes out-of-pocket costs can be evaluated using these net price elasticities even if that policy involves changing key programs such as Child Care Benefit or Child Care Rebate.

Our research is novel internationally, with the combination of (1), (3) and (5) providing substantial improvement over previous attempts to realistically model child care demand and married women’s labour supply. Before applying the model to understand the likely effects of increased child care costs, we elaborate on several key aspects.

The main difficulty which arises in modelling the effect of changing costs of child care on married women's labour supply is attempting to separate out the two reasons for which people use child care: (1) to free up time to work; and (2) as an input to child development. If child care were only a cost of working the problem would be quite simple and child care costs could simply be added to the standard labour supply model as an additional cost.

This is clearly not the case. We observe that families do not simply choose the least expensive option for child care (which they would do if they were just minimising cost with no regard for the intellectual, social and psychological development of their children) but rather they attempt to balance cost with quality, proximity and other factors. Furthermore, child care is not used exclusively for freeing up time to work. A quick look at the data reveals a rich array of patterns. Some women who do no paid work nonetheless put their children in child care. Some women who engage in paid work use no paid child care. Most use some mix and there is not necessarily a direct match between hours worked and hours in child care.
In order to estimate the effect of changing costs of child care on married women’s labour supply, we thus need to model both the working decisions of women and the child care decisions of the family in a way that allows them to be related to one another but allows child care to serve multiple purposes. Hence, (1) and (5) above are key elements of adding this dimension of realism to the model.

Related to this difficulty of modelling the multiple reasons for which people use child care is the understanding of the price of child care that families face when deciding whether or not to work. The price that we observe an individual family pay for child care can be thought of as having two components—a component which represents the minimal cost of obtaining child care and a discretionary component that represents the price for additional attributes such as quality or proximity.

Consider two families who live next door to each other but who pay different amounts for child care even though they have children of the same age using the same amount of child care. We cannot reasonably think of them as purchasing their child care in different markets. Rather, the price difference represents a differential valuation of these other attributes.

Therefore, it would be incorrect to take the price that a family pays as the cost of working component of child care because we will be confounding the family’s preferences about child care quality and proximity with the costs that a family must pay for child care if the mother decides to work. This is important because when we evaluate how changing costs of child care might affect married women’s decisions to work, we do not want to impose the preferences of one family on another. In order to evaluate cost changes, we also need to estimate the price which families who do not use child care would pay if they decided to use child care.

To address these problems, we construct local area average prices as described in (2) above. Technically, this turns out to be a crucial issue. In Gong et al (2011), we show that failure to do this results in estimates of a statistically insignificant effect of the price of child care on married women’s decision to work. Previous research in Australia using household-level price data (see Rammohan and Whelan (2005, 2007)) found no impact of child care price on married women’s labour supply decisions. Similarly, in their report, Access Economics (2009) states ‘The findings of research commissioned by the ECDSC (Access Economics) suggest the cost, quality and availability of child care have no statistically significant impact on parents’ labour supply decisions.’ In Gong et al (2011), we show that this finding of no significant impact appears to be driven by measurement error in the child care price. In that paper we do find a small, but statistically significant (and negative) effect of the price of child care on partnered women’s labour supply using child-level data that was not available to Rammohan and Whelan.

3.2 Estimation

Model estimation is not trivial. It involves integrating a multiple-dimensional integral and incorporates a very rich set of observable variables and allows for complicated relationships between unobserved preferences. We use numerical integration for estimation and computer simulation to derive key model parameters such as elasticities. We refer the interested reader to Gong and Breunig (2011a) for the full technical specification.

3.3 Data

We briefly mention the data source for our study which is the Household Income and Labour Dynamics in Australia (HILDA) data. The decision by the Australian Government to invest in a longitudinal study of Australian households has revolutionised the empirical social sciences in Australia. Australia now has a household-level panel data set to rival those of the United States and Europe. Without such data, the study undertaken here and the insights it provides into policy would not have been possible.
The HILDA data are described in Wooden and Watson (2007). We take advantage of data which has only been available since wave five (2005) in which households were asked about child care expenditure for specific types of care and for specific age ranges of children. Further, we use the in-confidence version of the data which allows us to match households to the Australian Bureau of Statistics Labour Force Survey region by postcode. This allows us to construct our key variable, local area child care price. By averaging across households in each Labour Force Survey region, we eliminate the effect of the family’s decision about how much quality to purchase. Instead we capture the local average price that families face in their surrounding area. Our modelling assumption is that households react to the average (median) price level irrespective of the quality they choose. This is akin to assuming that shifts in median prices affect all quality levels. We eliminate measurement error by using actual hours spent in child care to construct prices rather than hours worked by the mother as some studies have done. Our model is estimated on waves five through seven of HILDA.

Finally, HILDA provides a very rich set of variables that we can use to model child care demand and married women’s labour supply. We account for important factors which determine married women’s work decisions such as education, experience, other family income and number of children. We control for the presence of potential providers of informal child care both within and outside of the household. Gong et al (2011) and Gong and Breunig (2011a) provide details of the full set of explanatory variables which are included in the model.

A final consideration which favours using post-2005 data is that the Australian Bureau of Statistics (2010) created a gross child care price index from 2005, which we use to make the price comparable across waves and to project prices for future years.

4 Results

In this section we present the various price change scenarios that we consider. We then look at four types of effects: the effect on married women’s labour supply, the effect on child care demand and expenditure, the effect on household disposable income and the effect on government balances including child care subsidy costs and the net effect on government expenditure.

The Regulation Impact Statement for Early Childhood Education and Care Quality Reforms (The Commonwealth of Australia (2009e)) notes ‘...there is no reliable evidence to suggest that incremental increases in the quality of ECEC results in significant behavioural responses of parents (when both quality and the countervailing impacts of price are considered), including workforce participation.’ They quote Access Economics (2009) who state that ‘...it is assumed that the NQA will have no statistically significant impact on the workforce participation of parents, and therefore no impacts have been modelled in this regard.’ It is important to note that these propositions are relying on the previous Australian literature, notably Doiron and Kalb (2005) and Rammohan and Whelan (2005, 2007), which find no statistically significant effect of child care price on married women’s labour supply. As we discuss above, our solution to the mis-measurement of child care price using newly available data and our improved modelling and estimation strategy explain why we find significant effects.

It is also important to note that we do not know what the effect of increased quality will be on child care demand. Breunig et al (2011) find a positive relationship, using HILDA data, between self-reported quality and child care demand at the local level, but they are unable to estimate an elasticity for quality. To the best of our knowledge, there are no studies which quantify the labour supply response to improvements in child care quality.
The effects that we find are small. If we assume an increase of $13 per child per day\(^4\), which represents a 17 per cent increase in gross costs, in the costs of child care (a mid-range estimate from the scenarios which we consider below) which is fully passed on to the gross price of child care, we find that married women’s labour force participation decreases by just over one-half of one percentage point. Without the change, married women’s labour force participation is 61.1 per cent. We find that hours worked decreases by 20 minutes per week (on a base of 15.5 hours per week) on average across the population of married women. In interpreting these numbers it is important to remember that many households will not change at all while some households may have changes much larger than the average.

We also find that demand for formal child care goes down as the price goes up. For a price increase of $13 per child per day, we find a decrease in formal child care demand of 25 minutes per week (on a base of 9.6 hours per week on average) and a decrease in formal child care usage of three-quarters of one percentage point. Without the change, 50.4 per cent of households use child care. Household disposable income decreases by $12.50 per week and net government expenditure increases by $10.82 per week (this includes reduced tax revenue as well as the effect of subsidies on child care being paid out against higher gross prices.) Household disposable income without the change is $1,888.59, thus this represents a 0.6 per cent decrease in household disposable income.

4.1 Price change scenarios

We consider three scenarios for the effect on child care prices of the NQF. For each scenario, we consider the effect in 2012 for two versions of the price scenario:

- the effect in 2012 of the cost increase of complete implementation of the NQF \((\text{the total impact})\)
- the effect in 2012 of the cost increase of partial implementation of NQF \((\text{the initial impact})\).

The \textit{total impact} calculation can be viewed as an estimate of the full impact of the NQF if it were to be \textit{implemented immediately}. In reality, some of the NQF reforms are not due to come into force until post-2012. See section 2 above. This full impact would therefore not realistically be felt in 2012, but rather by 2019 or 2020, allowing for some lag time in the adjustment to the new reforms. In order to extend our model estimates out to 2019/2020, we would have had to make assumptions about growth in real wages and non-labour income far into the future that seemed difficult to justify. Even small deviations from trend growth of real wages and non-labour income would swamp any effects of the NQF. The \textit{total impact} here is the total cost applied to a 2012 base. Applying it to a 2019/2020 base could be done by making additional assumptions. We think that this \textit{total impact} applied to a 2012 base is easier to interpret and understand.

The justification for the \textit{initial impact} is this delayed roll-out of some of the NQF reforms and the possibility that even the 2012 reforms may take time to be implemented fully. For example, Access Economics (2009) assumes that the NQF reforms will only be gradually implemented due to lack of qualified staff. We are aware of anecdotal evidence as well. Some centres operate with ‘exemptions’ which allow them to operate without the current required level of qualified staff, usually provided those staff are undertaking study towards the appropriate qualification\(^5\).

The \textit{initial impact} is calculated as being just over one-half of the \textit{total impact} of the NQF. This calculation is based upon the results of Access Economics (2009) which accounts for the likelihood that adjustment to the new standards will not be instantaneous and also that some of the new standards do not apply until later years (see section 2 above).

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4 All the price changes we consider are in addition to the trend increase in child care prices that would have continued in the absence of the NQF—see below. In our modeling, the average price per hour paid in the sample from HILDA is inflated using the child care price index as described below to give an average projected child care price in 2012 of $7.59 per hour or $75.90 for a full day. Our sample average price corresponds roughly with prices from the child care census if we compare years where both are available. The results are insensitive to a reasonable range of base prices.

5 This is the case, for example, in Canberra’s largest day care centre and in several other centres where we spoke to staff. Other industry sources told us that this was not uncommon.
The three ‘total impact’ scenarios are as follows:

1. Gross child care price increases by $4.02 per day.  
   This corresponds to cost scenarios two and three in Access Economics (2009) and is also quoted in The Commonwealth of Australia (2009e).

2. Gross child care price increases by $13 per day.  
   Based upon ‘average’ expected cost increase, see Australian Childcare Alliance (2011), The Daily Telegraph (2011) and Tweed Daily News (2011).

3. Gross child care price increases by $25 per day.  

The three ‘initial impact’ scenarios are scaled versions of scenarios 1 through 3:

4. Gross child care price increases by $2.13 per day.  
   This corresponds to scenario three in Access Economics (2009)

5. Gross child care price increases by $6.89 per day.


Scenarios one and three represent lower and upper bounds that we have found in our survey of available sources. Scenario three appears to be a worst case scenario, as Australian Childcare Alliance (2011) states ‘25% of centre providers say their parents will be hit by cost increases of $25 per child per day.’ Importantly, these price changes are changes in addition to the normal trend of child care prices. These are the effects of the NQF added on top of price rises that could have been expected in the absence of the NQF.

Our model estimates are, as discussed above, net of current policy settings so they are appropriate for estimating the impact of a policy change. Nonetheless, we need to make a variety of assumptions to generate predictions. We list the most important of those here.

- As the baseline price, we use the child care price that we estimate from the HILDA data.

- We inflate this child care price in our sample to 2012 using the average annual growth rate calculated with the gross child care price index. See Australian Bureau of Statistics (2010). For 2011 and 2012, we use the average gross child care price inflation rate over the past five years. This is equivalent to assuming that the rate of inflation of gross child care price remains the same as over the past five years.

- We assume that real wage and non-labour income grow at an annual rate of 2 per cent and then inflate to 2012 dollars. This follows what Access Economics (2009) has done and seems reasonable.

- We assume that the per-day cost is applied to a base of 10 hours per day. The full-day rate at many child cares covers a 10-hour slot.

We have tried our best to make reasonable assumptions. In 4.6 we discuss how some of these may be incorrect and how this would affect our results.

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6 The costs from Access Economics (2009) appear to be in 2009 dollars. We take this into account in our modeling by translating these to 2012 dollars as described below.

7 Tweed Daily News (2011) names the Productivity Commission, but this appears to be a miscitation. Tweed Daily News (2011) reports similar information but only quotes ‘an industry report.’ The industry report would appear to be from Australian Childcare Alliance (2011) who also quote Productivity Commission (2011). The Productivity Commission report mentions the possibility of increased costs from the NQF, but from our reading appears to contain no quantitative estimates.
4.2 Labour supply effects

Labour supply effects are modest, but statistically significant. If the NQF were completed adopted in 2012, we find that married women’s labour force participation would decrease somewhere between 0.16 and 1.2 percentage points depending upon the size of the price increase. Average hours worked would decrease by between five and thirty five minutes per week. If we consider the scenario of only partial compliance with the NQF in 2012, we find effects about half that size. See Tables 1 and 2.

In Table 3 we consider the effects by sub-group of the population. We only look at the ‘initial 2012 impact’, that is the impact of partial compliance with the NQF and only with those parts of it which come into force in 2012. We only consider the intermediate scenario, where the initial price impact is $6.89 per day per child.

Columns 2 and 3 of Table 3 compare the effects for households with multiple children to those with only one child. Unsurprisingly, the effects are nearly double for those households with multiple children compared to those with only one child. Participation of married women decreases 0.4 percentage points in response to the price increase in multiple child households whereas in those households with only one child, participation decreases by 0.23 percentage points.

Table 1: ‘Total impact*(a) of National Quality Framework (NQF)
Table reports average weekly changes per household

<table>
<thead>
<tr>
<th></th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
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<tr>
<td>Price increase per child per day</td>
<td>$4.02</td>
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<td>$25.00</td>
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<td>Married women’s labour supply effects</td>
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<td></td>
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<tr>
<td>Change in hours worked</td>
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<td>-0.294</td>
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<td>(0.022)</td>
<td>(0.074)</td>
<td>(0.145)</td>
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<tr>
<td>Change (%) in participation</td>
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<td>-0.573%</td>
<td>-1.192%</td>
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<td>(0.038)</td>
<td>(0.132)</td>
<td>(0.265)</td>
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<td>Child care demand effects</td>
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<td>Change in hours of formal care</td>
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<td>(0.035)</td>
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<td>Change (%) in participation in formal care</td>
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<td>(0.041)</td>
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</tr>
<tr>
<td>Change in gross costs ($) of formal child care</td>
<td>4.658</td>
<td>14.212</td>
<td>25.322</td>
</tr>
<tr>
<td>(0.811)</td>
<td>(2.624)</td>
<td>(5.013)</td>
<td></td>
</tr>
<tr>
<td>Change in net costs ($) of formal child care</td>
<td>2.169</td>
<td>7.252</td>
<td>14.142</td>
</tr>
<tr>
<td>(0.807)</td>
<td>(2.588)</td>
<td>(4.854)</td>
<td></td>
</tr>
<tr>
<td>Change in hours of informal care</td>
<td>0.034</td>
<td>0.113</td>
<td>0.224</td>
</tr>
<tr>
<td>(0.041)</td>
<td>(0.132)</td>
<td>(0.252)</td>
<td></td>
</tr>
<tr>
<td>Income and program effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in disposable income ($)</td>
<td>-1.576</td>
<td>-5.290</td>
<td>-10.422</td>
</tr>
<tr>
<td>(less child care costs)</td>
<td>(0.403)</td>
<td>(1.329)</td>
<td>(2.566)</td>
</tr>
<tr>
<td>Change in disposable income ($)</td>
<td>-3.745</td>
<td>-12.542</td>
<td>-24.564</td>
</tr>
<tr>
<td>(including child care costs)</td>
<td>(0.509)</td>
<td>(1.614)</td>
<td>(3.029)</td>
</tr>
<tr>
<td>Change in child care subsidy ($)</td>
<td>2.489</td>
<td>6.960</td>
<td>11.180</td>
</tr>
<tr>
<td>(received)</td>
<td>(0.297)</td>
<td>(0.920)</td>
<td>(1.620)</td>
</tr>
<tr>
<td>Change in government expenditure ($)</td>
<td>3.632</td>
<td>10.821</td>
<td>18.801</td>
</tr>
<tr>
<td>(net of child care subsidies)</td>
<td>(0.493)</td>
<td>(1.494)</td>
<td>(2.797)</td>
</tr>
</tbody>
</table>

Numbers in parentheses are standard errors
Net government expenditure is income support, family tax benefit and child care subsidies (Child Care Benefit and Child Care Rebate) less tax revenue
All estimated effects are statistically significant except for informal care hours
*(a) The effect in 2012 of full implementation of the NQF (see Section 4.1)
Columns 4 and 5 of Table 3 compare the effects for high and low wage women (high and low being defined relative to median wages of married women). Interestingly, we find slightly larger effects on households with high-wage women compared to low wage women. This could be because higher wage women work more to begin with and are using more child care so the impact on them is greater. Because of means testing of child care benefit, the net price impact on higher wage women (who live in wealthier households) is also larger. We also split the sample by education levels of women, education levels of men, and level of unearned income in the household. The relative impacts across these sub-groups is very similar to columns 4 and 5 of Table 3. Households with higher educated husbands, higher educated wives, and which are wealthier are all affected more than their counterparts. In this respect, the policy changes appear to be slightly more favourable to the less well-off.

Table 2: ‘Initial impact’ of National Quality Framework (NQF)
Table reports average weekly changes per household

<table>
<thead>
<tr>
<th></th>
<th>Scenario 4</th>
<th>Scenario 5</th>
<th>Scenario 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price increase per child per day</td>
<td>$2.13</td>
<td>$6.89</td>
<td>$13.25</td>
</tr>
<tr>
<td><strong>Married women’s labour supply effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in hours worked</td>
<td>-0.045</td>
<td>-0.151</td>
<td>-0.300</td>
</tr>
<tr>
<td>(0.012)</td>
<td>(0.039)</td>
<td>(0.076)</td>
<td></td>
</tr>
<tr>
<td>Change (%) in participation</td>
<td>-0.084%</td>
<td>-0.287%</td>
<td>-0.585%</td>
</tr>
<tr>
<td>(0.020)</td>
<td>(0.067)</td>
<td>(0.134)</td>
<td></td>
</tr>
<tr>
<td><strong>Child care demand effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in hours of formal care</td>
<td>-0.063</td>
<td>-0.211</td>
<td>-0.419</td>
</tr>
<tr>
<td>(0.019)</td>
<td>(0.060)</td>
<td>(0.113)</td>
<td></td>
</tr>
<tr>
<td>Change (%) in participation in formal care</td>
<td>-0.111%</td>
<td>-0.380%</td>
<td>-0.776%</td>
</tr>
<tr>
<td>(0.022)</td>
<td>(0.072)</td>
<td>(0.141)</td>
<td></td>
</tr>
<tr>
<td>Change in gross costs ($) of formal child care</td>
<td>2.499</td>
<td>7.837</td>
<td>14.462</td>
</tr>
<tr>
<td>(0.429)</td>
<td>(1.391)</td>
<td>(2.675)</td>
<td></td>
</tr>
<tr>
<td>Change in net costs ($) of formal child care</td>
<td>1.135</td>
<td>3.772</td>
<td>7.397</td>
</tr>
<tr>
<td>(0.427)</td>
<td>(1.382)</td>
<td>(2.636)</td>
<td></td>
</tr>
<tr>
<td>Change in hours of informal care</td>
<td>0.018</td>
<td>0.058</td>
<td>0.115</td>
</tr>
<tr>
<td>(0.022)</td>
<td>(0.070)</td>
<td>(0.135)</td>
<td></td>
</tr>
<tr>
<td><strong>Income and program effects</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in disposable income ($) (less child care costs)</td>
<td>-0.825</td>
<td>-2.741</td>
<td>-5.396</td>
</tr>
<tr>
<td>(0.212)</td>
<td>(0.697)</td>
<td>(1.355)</td>
<td></td>
</tr>
<tr>
<td>Change in disposable income ($) (including child care costs)</td>
<td>-1.960</td>
<td>-6.513</td>
<td>-12.792</td>
</tr>
<tr>
<td>(0.271)</td>
<td>(0.868)</td>
<td>(1.644)</td>
<td></td>
</tr>
<tr>
<td>Change in child care subsidy ($) received</td>
<td>1.364</td>
<td>4.065</td>
<td>7.066</td>
</tr>
<tr>
<td>(0.158)</td>
<td>(0.505)</td>
<td>(0.936)</td>
<td></td>
</tr>
<tr>
<td>Change in government expenditure ($) (net of child care subsidies)</td>
<td>1.962</td>
<td>6.060</td>
<td>11.004</td>
</tr>
<tr>
<td>(0.243)</td>
<td>(0.794)</td>
<td>(1.522)</td>
<td></td>
</tr>
</tbody>
</table>

Numbers in parentheses are standard errors
Net government expenditure is income support, family tax benefit and child care subsidies (Child Care Benefit and Child Care Rebate) less tax revenue
All estimated effects are statistically significant except for informal care hours
8 The effect in 2012 of partial implementation of NQF (see Section 4.1)
**Table 3: ‘Initial impact’ of National Quality Framework (NQF)**
Response to price increase of $6.89 per day by population sub-group
Table reports average weekly changes per household

<table>
<thead>
<tr>
<th>Population sub-group</th>
<th>Households with multiple children</th>
<th>Households with one child</th>
<th>Women with above median wages</th>
<th>Women with below median wages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Married women’s labour supply effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in hours worked</td>
<td>-0.182 (0.049)</td>
<td>-0.135 (0.035)</td>
<td>-0.166 (0.043)</td>
<td>-0.137 (0.035)</td>
</tr>
<tr>
<td>Change (%) in participation</td>
<td>-0.402% (0.097)</td>
<td>-0.226% (0.053)</td>
<td>-0.309% (0.071)</td>
<td>-0.265% (0.064)</td>
</tr>
<tr>
<td><strong>Child care demand effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in hours of formal care</td>
<td>-0.240 (0.091)</td>
<td>-0.196 (0.047)</td>
<td>-0.241 (0.059)</td>
<td>-0.181 (0.064)</td>
</tr>
<tr>
<td>Change (%) in participation in formal care</td>
<td>-0.440% (0.102)</td>
<td>-0.348% (0.060)</td>
<td>-0.441% (0.081)</td>
<td>-0.319% (0.066)</td>
</tr>
<tr>
<td>Change in gross costs ($) of formal child care</td>
<td>10.226 (2.177)</td>
<td>6.563 (1.050)</td>
<td>8.879 (1.447)</td>
<td>6.797 (1.375)</td>
</tr>
<tr>
<td>Change in net costs ($) of formal child care</td>
<td>4.095 (2.112)</td>
<td>3.599 (1.045)</td>
<td>4.907 (1.407)</td>
<td>2.638 (1.397)</td>
</tr>
<tr>
<td>Change in hours of informal care</td>
<td>0.055 (0.103)</td>
<td>0.054 (0.060)</td>
<td>0.074 (0.067)</td>
<td>0.042 (0.074)</td>
</tr>
<tr>
<td><strong>Income and program effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change in disposable income ($) (less child care costs)</td>
<td>-3.462 (0.910)</td>
<td>-2.357 (0.597)</td>
<td>-3.617 (0.934)</td>
<td>-1.867 (0.466)</td>
</tr>
<tr>
<td>Change in disposable income ($) (including child care costs)</td>
<td>-7.558 (1.464)</td>
<td>-5.956 (0.659)</td>
<td>-8.524 (0.782)</td>
<td>-4.506 (1.059)</td>
</tr>
<tr>
<td>Change in child care subsidy ($) received</td>
<td>(6.130) (0.968)</td>
<td>2.964 (0.284)</td>
<td>3.971 (0.455)</td>
<td>4.159 (0.564)</td>
</tr>
<tr>
<td>Change in government expenditure ($) (net of child care subsidies)</td>
<td>8.864 (1.313)</td>
<td>4.565 (0.544)</td>
<td>6.574 (0.874)</td>
<td>5.546 (0.736)</td>
</tr>
</tbody>
</table>

Numbers in parentheses are standard errors
Net government expenditure is income support, family tax benefit and child care subsidies (Child Care Benefit and Child Care Rebate) less tax revenue
All estimated effects are statistically significant except for informal care hours
\(^{63}\) The effect in 2012 of partial implementation of NQF (see Section 4.1)
4.3 Effects on child care demand

The second panel of Tables 1 through 3 presents the effect on hours demanded of formal child care, participation in formal child care, gross and net costs of formal child care, and the impact on informal care. We find that formal care decreases between seven and forty-nine minutes per week on average across the scenarios with the ‘initial 2012 impact’ half of these amounts. Again, we find a larger effect in wealthier and better-educated households.

Net, out-of-pocket costs on child care can be expected to increase between $2.17 and $14.14 per week per household. Again the ‘initial 2012 impact’ is approximately half of these amounts. Informal care increases, as expected. As formal child care becomes more expensive, informal care becomes a more attractive alternative. However our estimates for the change in informal care are not statistically different than zero. In our estimates, these are the only quantities that are not statistically different than zero. In our model, informal care is modelled as a residual and is fairly poorly identified.

4.4 Effects on household income and expenditure

Our model allows households to change consumption, hours worked, and child care demand to new values which are the ‘best’ in utility terms for that household under the new policy. As married women's labour force participation and hours decrease, household income goes down. As child care prices increase, even though they are partially offset by increased government transfer payments, the costs of child care increase. Thus the net effect is a negative one on household disposable income.

If the government were to attempt to compensate households for this lost utility, one way to do that would be to increase the Child Care Benefit (CCB) and Child Care Rebate (CCR). Gong and Breunig (2011b) show that increasing CCB is more beneficial for low-income households while increasing CCR tends to be more beneficial to higher income households. Higher income households have less access to CCB because the program is means-tested. Higher income households benefit more from an increased tax rebate as the rebate is paid on a higher base income. It is worth noting that CCR is now capped at $7,500 per annum for out of pocket costs which limits the degree to which higher-income households could benefit from an increased CCR.

We find that household disposable income decreases between $3.75 and $25.56 per week under full implementation of the NQF. These results are in the third panel of Tables 1 and 2. The effect is larger in wealthier and better-educated households (Table 3). In the Tables, we provide these figures including and excluding child care costs to show which part of this decrease in disposable income is generated by labour force behaviour and which part is generated by higher child care prices.

4.5 Effect on government income and expenditure

The program will affect both the revenue and expenditure sides of the government balance sheet. As married women work less, tax revenue will decrease. As gross child care price increases, Child Care Benefit (CCB) and Child Care Rebate (CCR) payments will increase, holding hours constant. We find that the overall effect is an increase in net government expenditure (benefits less tax) of between $3.63 and $18.80 per household per week. Our model incorporates the tax system (of 2011-2012) and its non-linearities (including the tax free threshold) as well as income support payments, Family Tax Benefit, CCB and CCR. For the population of married women with children this encompasses the vast majority of government intakes and outlays.

4.6 Caveats

There are several important caveats to our results. Perhaps the biggest caveat is that our analysis is partial equilibrium; we assume the macro-economic environment remains the same. The effects of the NQF are small relative to, for example, the resources boom or the effect of global financial shocks. Any effect of the NQF is likely to be completely swamped by such large macro-economic phenomena.
We take the cost estimates as given. They may be over-estimates or they may be under-estimates. We do not have access to detailed administrative data which would allow us to evaluate the cost estimates or generate our own.

As most labour supply literature does, we ignore the demand side of the labour market. That is, it is assumed that there are no market restrictions on the mother’s ability to pick between the discrete hours choices for work and child care. Just because the discrete hours points are the most common in the data, does not mean that they are necessarily available at a micro level for each individual.

As discussed above, we recognise the importance of improvements in child care quality on child care demand but we are unable to quantify the effects. There is evidence that families care about quality and that local self-reported levels of satisfaction with child care quality are related to women’s labour supply and participation. In order to quantify this observation we would need estimates of the response of women’s labour supply to changes in levels of measurable quality indices such as staff-to-student ratios and/or staff qualification levels. This would then provide a ‘quality elasticity’ that could be used to evaluate the NQF changes. We do not know of any such quantitative estimates, but this could be done using existing administrative data.

Finally, we ignore further repercussions from the supply side of the child care market which may also determine price changes. (For example, child care centres altering the number of places in response to changed demand by parents.) Access Economics (2009), in generating their cost scenarios, assumes no further supply side effects. In section 5.3.3, they say ‘the NQA reforms are assumed to not deviate growth in ECEC places from its projected path’. They further justify the assumption of no supply side reaction by quoting a survey that finds ‘95.3% of services ... would increase staff costs rather than decrease places.’ The assumption of no additional supply side response relies on a low price elasticity of demand. We find a net price elasticity of demand of -0.25, which is slightly higher than the previous research, for the reasons described above. Thus, the ability of child care centres to fully pass increased costs to parents may not be as great as is assumed by Access Economics (2009). We do not know what the other studies have assumed.

In general in the literature, our understanding of the supply side is not as developed as that of the demand side. What determines the opening of a new child care centre, the closing of one, the number of places offered? What is the nature of competition in the child care industry? Quantitative work on the supply side of the child care industry should be an important priority for future research.

5 Conclusion

We find that the implementation of the National Quality Framework (NQF) is likely to have modest negative effects on the labour supply of married women. Assuming that the NQF causes an increase in the gross price of $13.00 per child per day (a midrange price scenario out of the range considered in the paper), we find that average hours worked will decrease by about 20 minutes per week while participation in work will decrease by a little over one-half of one percentage point. Child care demand will decrease by slightly larger amounts while out-of-pocket child care costs for families will increase by $7.25 per week after accounting for off-setting government subsidies to child care. Overall, household disposable income will decrease by $12.54 per week which comprises both increased child care costs and reduced income from working less. Net government expenditure, taking into account decreased tax revenues, increased child care subsidies and changes to income support and family tax benefit payments caused by changing working hour patterns will increase by $10.82 per household per week. The effects are statistically significant.
The actual effects could be larger or smaller than these numbers depending upon how price actually responds with the introduction of the NQF. We have attempted to cover a range of plausible scenarios. It is important to keep these fairly modest effects in context. Major global events will have much larger impacts on the well-being of Australian households than any of these changes discussed here.

In the introduction we highlighted the widespread agreement amongst educators, psychologists, economists and health professionals about the importance of and potential gains from investment in children. The NQF represents an investment in children which will likely bring long-term benefits. In this paper, we have tried to quantify the costs in four dimensions—labour supply, child care demand, household income and government balance sheet; these do not represent all the costs.

Given expected future benefits for Australia’s children, the costs outlined here seem relatively small. Our intuition tells us that the investment is worth it. This of course is a matter of judgement. The main contribution here is to apply cutting-edge economic modelling and econometric estimation to better inform the debate.
Acknowledgements

In the course of our research on child care in Australia, the list of people to whom we are indebted has grown quite large. At the risk of omitting key people, we would like to thank Patricia Apps, Richard Blundell, Mark Bott, Rebecca Cassels, Véronique Danjou, Mary Hemingway, Guyonne Kalb, Anthony King, Gordon Leslie, Laura Llewellyn, Joseph Mercante, Maryanne Mrakovcic, Mike Power, Leo Vance, Christopher Vas, Andrew Weiss, Stephen Whelan and Chikako Yamauchi.

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The views in the paper are those of the authors and do not represent the views of the HC Coombs Policy Forum nor the Australian Treasury nor anyone else mentioned in these acknowledgements.

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References


