ACCESS ECONOMICS Pty Limited

July 2009

An economic analysis of the proposed ECEC National Quality Agenda

Report by Access Economics Pty Limited for

The Department of Education, Employment and Workplace Relations

TABLE OF CONTENTS

EXECUTIVE SUMMARY ..... **i**

1. Introduction **1**

2. Background **3**

2.1 The ECEC reform agenda 3
2.2 ECEC in Australia: an overview 4
2.3 Current regulatory arrangements 9
2.4 Complementary reforms 14

3. Potential benefits: identification and literature review **16**

3.1 Benefits of higher quality ECEC 16
3.2 Benefits of a streamlined regulatory framework 34
3.3 Benefits of a quality rating system 37
3.4 Conclusions 38

4. Policy scenarios **39**

4.1 National Quality Standard 39
4.2 Enhanced Regulatory Arrangements 40
4.3 Quality rating system 41

5. Modelling and analysis **43**

5.1 Framework for the analysis 43
5.2 Data sources and specification 44
5.3 Modelling parameters and assumptions 45

6. Model results **51**

6.1 Costs of the new National Quality Standard 51
6.2 Regulatory costs 55
6.3 Sensitivity analysis 55
6.4 Implementation 56
6.5 Competition impacts 57

7. References **59**

Appendix A: Wage rate assumptions **62**

Appendix B: LDC and preschool scenario summary – cost per child per day **65**

Appendix C: LDC and preschool scenario summary – real annual cost **72**

Appendix D: Detailed LDC results tables **80**

FIGURES

Figure 2.1: Forecast growth in ECEC utilisation, by state 9
Figure 3.1: Illustration of increasing returns from quality 33
Figure 3.2: Illustration of decreasing returns from quality 33

TABLES

Table 2.1: Options for ECEC in Australia 4
Table 2.2: Number of ECEC services by state, 2008 6
Table 2.3: Number of licensed places (FTE), by state, 2008 7
Table 2.4: Number of licensed places used (FTE), by state, 2008 7
Table 2.5: Number of services, by ownership type, 2008 8
Table 2.6: Number of services, by region, 2008 8
Table 2.7: Regulation and licensing of ECEC services, 2007 11
Table 2.8: Minimum staff to child ratios in centre-based LDC 11
Table 2.9: Minimum staff to child ratios in FDC 12
Table 2.10: Minimum staff to child ratios in centre-based preschool 12
Table 2.11: State government funding 14
Table 3.1: Impacts of targeted higher quality ECEC on criminal activity^ 26
Table 3.2: Impacts of targeted, higher quality ECEC on educational attainment^ 27
Table 3.3: Comparison of ECEC cost-benefit analyses 30
Table 3.4: Overlap between NCAC quality principles and state regulations, FDC 35
Table 3.5: Overlap between NCAC quality principles and state regulations, LDC 35
Table 4.1: National Quality Standard scenarios 40
Table 5.1: Assumed current ECEC quality levels, LDC 45
Table 6.1: LDC cost summary 52
Table 6.2: Real average annual cost estimates ($real per child per day), Australia 52
Table 6.3: Summary of LDC costs by state 53
Table 6.4: Preschool cost summary to 2020 54
Table 6.5: Real average annual preschool cost estimates ($real per child per day), Australia 54
Table 6.6: Summary of preschool costs by state 54
Table 6.7: FDC cost summary 55
Table 6.8: Real discount rate sensitivity analysis 56
Table 6.9: LDC qualified labour growth rate sensitivity analysis 56
Table 6.10: LDC demand growth rate sensitivity analysis 56

EXECUTIVE SUMMARY

In December 2007, the Council of Australian Governments (COAG) agreed to a partnership between the Commonwealth and state and territory governments to pursue substantial reform in the areas of education, skills and early childhood development. A central component of this agenda was a commitment to the development and implementation of a new National Quality Agenda (NQA) for Early Childhood Education and Care (ECEC) in Australia.

The objective of the NQA is to provide parents, communities and operators of ECEC services with a nationally consistent, streamlined and integrated licensing and accreditation system which ensures quality standards are implemented and maintained across all ECEC services.

In order to inform the development of the NQA and to assess its impacts on the industry and its stakeholders, Access Economics was engaged by the Department of Education, Employment and Workplace Relations (DEEWR) on behalf of the (then) Early Childhood Development Subgroup (ECDS) to undertake a cost-benefit analysis of the proposed reforms. The analysis considers the impacts of the proposed policy changes on the entire ECEC sector. Consistent with the policy emphasis, however, the focus is on the Long Day Care (LDC), Family Day Care (FDC) and preschool sectors. Further work, including cost-benefit analysis, will be undertaken in the future by governments to look at how other services such as in-home care (IHC), occasional care and non-mainstream services will be incorporated.

The analysis focuses on three key elements of the proposed NQA:

- a **National Quality Standard** for ECEC;
- **enhanced regulatory arrangements**; and
- a **quality rating system** to drive continuous improvement and provide parents with robust and relevant information about the quality of care and learning.

The other core aspect of the NQA is the Early Years Learning Framework (EYLF), but is not within the scope of this report.

The study draws on the findings of a range of other commissioned studies, published research and public and unpublished data to analyse how the proposed reforms will impact on the ECEC industry and its key stakeholders. Consultations were also undertaken with state and territory governments in each jurisdiction to enhance the understanding of operational differences across states, and to source data from state and territory government repositories. The data and parameters sourced are brought together in a conventional cost-benefit framework to assess the reforms' net benefits to the Australian economy. Information provided by this study has assisted with the development of a COAG Consultation Regulation Impact Statement (RIS) on ECEC quality reform. The RIS can be viewed at **www.coag.gov.au**.

Assessing the impacts

A summary of the main costs and benefits potentially arising from the NQA is presented in Table A, below. The greatest impacts lie in the effects of the new **National Quality Standard**, where improved staff to child ratios and staff qualifications generate enhanced outcomes for children in ECEC, but at significantly increased labour costs.

TABLE A: POTENTIAL IMPACTS OF THE PROPOSED NATIONAL QUALITY AGENDA FOR ECEC

	Benefits	Costs
National Quality Standard	❑ Benefits resulting from children receiving incrementally higher quality care	❑ Additional staff required to meet new staff to child ratios ❑ Higher staff wages resulting from qualified staff requirements ❑ Costs of increasing the qualified ECEC workforce
Enhanced regulatory arrangements	❑ More efficient administration of industry regulation ❑ Reduced regulatory burden on industry	❑ Costs of transitioning to the new framework ❑ Costs of sharing information where the regulatory effort was previously duplicated
Quality rating system	❑ Better informed decision making by parents ❑ Potential augmentation of quality improvements over time	❑ Administration costs: collection and collation of data and the dissemination of service rating information

It should be noted that only the benefits of **enhanced regulatory arrangements** can be quantified with some certainty, whereas the impacts of a **quality rating system** are more difficult to ascertain. Similarly, there is at present insufficient evidence to reliably quantify the impacts of improvements in the structural quality of ECEC resulting from the **National Quality Standard**, although they are likely to produce the largest benefits.

Additional impacts may be expected should the NQA change parents' decisions to place their children in ECEC – either through an increase in quality or price of ECEC. In this case, enrolments in ECEC would be impacted and labour force participation decisions of parents would be affected. However, consistent with the international literature, modelling undertaken by Access Economics suggests that over the range of quality and price considered here, cost, quality and availability of child care have no statistically significant impact on parents' labour supply decisions (that is, demand for ECEC is relatively inelastic with respect to these factors). One possible explanation for the results is that, in the observed data, the effects of price and quality offset each other. Given this finding, the aggregate impact of the NQA on enrolments, and hence on parents' workforce participation, is assumed to be zero for modelling purposes.

Modelled scenarios

As the precise specifications of the policy are yet to be determined, a number of alternative policy scenarios have been modelled. The specifications of the **National Quality Standard** for LDC, preschool, and FDC are outlined in Table B.

TABLE B: NATIONAL QUALITY STANDARD SCENARIOS[1]

Scenario	Staff to child ratio	Qualifications
LDC and preschool Scenario 1 (Baseline)	❑ No COAG policy change.	❑ No COAG policy change.
LDC and preschool Scenario 2	❑ For children from birth to 24 months the staff to child ratio to be 1:4 by the end of 2015. ❑ For children aged 25 to 35 months the staff to child ratio to be 1:5 by the end of 2015. ❑ For children aged 36 months to school age the staff to child ratio to be 1:11 by the end of 2016.	❑ All staff working with children would be required to have a minimum Certificate III level qualification (or be enrolled in study) by the end of 2013. ❑ Fifty per cent of staff working with children are to have a qualification (or be enrolled in study) of Diploma or above by the end of 2013. ❑ Services that have 25-59 children on any day, are required to employ 1 full-time university qualified early childhood teacher by 2013. ❑ Services that have 60-80 children on any day are required to employ 0.5 of an additional university qualified professional by 2015, and a full additional university qualified professional for services with over 80 children on any day. ❑ Services with less than 25 children would be expected to have access to a proportion of an early childhood qualified teacher for educational leadership by 2013. ❑ Where the service provision only includes children birth to 3 years or where there is already a qualified teacher on site an appropriate alternative qualification may fulfil this requirement (with the need for and exact requirements for additional professionals to be determined).
LDC and preschool Scenario 3	❑ For children from birth to 24 months the staff to child ratio to be 1:4 by the end of 2011. ❑ For children aged 25 to 35 months the staff to child ratio to be 1:5 by the end of 2014. ❑ For children aged 36 months to school age the staff to child ratio to be 1:11 by the end of 2015.	
LDC and preschool Scenario 4	❑ For children from birth to 24 months the staff to child ratio to be 1:4 by the end of 2010 and 1:3 by the end of 2020. ❑ For children aged 25 to 35 months the staff to child ratio to be 1:5 by the end of 2015. ❑ For children aged 36 months to school age the staff to child ratio to be 1:10 by the end of 2013.	
FDC Scenario 1 (Baseline)	❑ No COAG policy change	❑ No COAG policy change
FDC Scenario 2	❑ Mixed age groups of children to have a staff to child ratio of 1:7 by 2011 with a maximum of four children under school age.	❑ All carers would be required to have a minimum Certificate III level qualification (or be enrolled in study) and all coordinators would be required to have a Diploma qualification no later than the end of 2013.

[1] The baseline for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC.

Modelling results

In net present cost (NPC) terms over the ten years to 2020, the total cost of the proposed new **National Quality Standard** in the LDC sector is estimated at $1.18 billion under Scenario 2, $1.25 billion under Scenario 3 and $2.16 billion under Scenario 4 (Table C). These reflect the incremental costs over the baseline, capturing exclusively those costs attributable to the NQA. As a result the baseline (Scenario 1) needs to be added to that modelled for the scenario to get total indicative cost.

Reflecting the relatively small improvement on current staff to child ratios, the impacts on the FDC sector are considerably less, with the new standards estimated to increase costs by $18.3 million in NPC terms. Preschool costs, in NPC terms over the ten years to 2020, are estimated at $314.4 million under Scenario 2, $332.3 million under Scenario 3 and $473.3 million under Scenario 4. Cost differences are driven by both changes in timing and, under Scenario 4, a higher staff to child ratio.

TABLE C: NEW STANDARDS COST SUMMARY, NPC TO 2020[2]

Service	Scenario 1 ($m)	Scenario 2 ($m)	Scenario 3 ($m)	Scenario 4 ($m)
LDC	1,032.2	1,181.2	1,247.0	2,157.4
FDC	0.0	18.3	-	-
Preschool	0.0	314.4	332.3	473.3

The average cost per child per day in LDC is estimated to increase as the reforms are implemented, with the effect most acute under Scenario 4 (Table D). By 2020, it is estimated that the average cost per child per day in LDC has increased by between $4.02 and $7.86 in real terms over and above the baseline (Scenario 1). For preschools, the average cost per child per day is estimated to increase, in real terms, by $3.01 under Scenario 2 and 3 and $3.74 by 2020 under Scenario 4.

TABLE D: INCREMENTAL CHANGE IN REAL COST PER CHILD PER DAY[3]

Service	Year	Scenario 1 ($)	Scenario 2 ($)	Scenario 3 ($)	Scenario 4 ($)
LDC	2015	2.70	3.20	3.26	5.69
LDC	2020	3.84	4.02	4.02	7.86
Preschool	2015	0.0	1.91	2.23	2.94
Preschool	2020	0.0	3.01	3.01	3.74

Table E shows the state by state cost impacts of the LDC scenarios. In aggregate, the trends broadly reflect the distribution of ECEC enrolments, though other factors such as the prevailing wage rates and the current stock of qualified labour are also key determinants. Differences in costs per child per day principally reflect differences in the current staff to child

[2] The baseline for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline.

[3] The baseline for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline.

ratios (although labour force characteristics are also a key driver), with those jurisdictions furthest from the proposed new standards experiencing the greatest increase in costs.

TABLE E: COSTS OF LDC SCENARIOS TO 2020, STATES AND TERRITORIES

	VIC	NSW	QLD	WA	TAS	SA	ACT	NT	TOTAL
Total cost (NPC to 2020 ($m))									
Scenario 1-Baseline	503.8	427.6	41.9	10.9	14.7	79.1	16.8	13.6	1,108.3
Scenario 2	146.8	346.5	451.8	45.1	13.9	148.5	13.1	15.7	1,181.2
Scenario 3	151.5	359.9	469.5	45.1	17.8	165.7	18.0	19.5	1,247.0
Scenario 4	406.5	523.6	804.9	107.6	32.6	209.7	42.1	35.4	2,157.4
Cost/child/day ($real in 2020)									
Scenario 1-Baseline	8.20	4.97	0.81	0.68	2.93	6.32	3.36	3.78	3.84
Scenario 2	2.82	3.63	5.14	1.77	2.34	8.49	2.22	3.37	4.02
Scenario 3	2.82	3.63	5.14	1.77	2.34	8.49	2.22	3.37	4.02
Scenario 4	7.30	6.40	9.57	5.38	5.63	12.04	7.43	7.49	7.86

The economic characteristics of the ECEC market suggest that the cost increases described above will likely be passed on to consumers through higher prices. Ultimately the impacts will be borne by the purchasers of ECEC; namely parents and the government. For eligible FDC and LDC services this relates to outlays through the Child Care Benefit and Child Care Tax Rebate. While final estimates remain to be determined, it is estimated that around 47% of costs will be borne by the Commonwealth.

As the specifications of the **regulatory arrangements** are yet to be finalised, it is not possible to supply a reliable costing at this stage. Both the impacts on the cost of administering industry regulation (the current licensing and accreditation processes) and the change in regulatory burden on industry, cannot be reliably estimated until the parameters governing the new models are refined.

Conclusions and implications

The reforms proposed under the National Quality Agenda have the potential to markedly increase the quality of ECEC in Australia, but moreover to ensure it is delivered in a consistent fashion and within an efficient regulatory environment.

Determining the net benefits of the **National Quality Standard** is not possible given the characteristics of the reforms proposed (in particular, their incremental and universal nature). While the new standards will unequivocally confer benefits on children in ECEC – and these impacts will be higher where the increase in the level of quality is greater – there is an insufficient evidence base on which to reliably quantify these benefits or compare them between scenarios.

Access Economics

July 2009

1. INTRODUCTION

Access Economics was engaged by the Department of Education, Employment and Workplace Relations (DEEWR) on behalf of the (then) Early Childhood Development Subgroup (ECDS) and the Quality Working Party (QWP) to undertake a cost-benefit analysis (CBA) of the proposed new National Quality Agenda (NQA) for Early Childhood Education and Care (ECEC) in Australia.

The development of the NQA stems from an agreed partnership between the Commonwealth and state and territory governments, committed to by the Council of Australian Governments (COAG) in December 2007. The aim of the partnership is to pursue substantial reform in the areas of education, skills and early childhood development, in order to deliver significant improvements in human capital outcomes in Australia. A central component of this agenda is the NQA. The NQA aims to provide parents, communities and operators of ECEC services with a nationally consistent, streamlined and integrated licensing and accreditation system which ensures the new National Quality Standard is implemented and maintained across all services.

Access Economics' analysis of the proposed NQA is undertaken in a conventional CBA framework. Potential costs and benefits are identified and analysed, and included in the cost-benefit modelling where the available data and evidence enables reliable quantification.

Given the significant amount of industry data available on costs and cost-drivers, the quantification of the reforms' costs is relatively comprehensive. However, though some of the key benefits such as reduced regulatory burden and administrative cost savings can be estimated with a satisfactory degree of confidence, in other areas there is inadequate data or research to inform a reliable quantification exercise. In particular, the absence of a sufficiently robust evidence base on which to quantify the benefits accruing from the new National Quality Standard means these benefits can be identified and outlined, but their magnitude cannot be accurately estimated. Due to the limited evidence base, and a high degree of interaction between quality variables, it is also difficult to attribute benefits from increasing quality to a single quality characteristic, or to quantify relative returns from different levels of investment in quality.

The study draws on the findings of a range of other commissioned studies, published research and public and unpublished data to analyse how the proposed reforms will impact on the ECEC industry and its key stakeholders. Consultations were also undertaken with state governments in each jurisdiction to enhance the understanding of operational differences across states, and to source data from state government repositories.

The report is presented as follows:

- Section 2 presents background and context to the report, over-viewing the industry and its current characteristics, the COAG reform agenda, and the economic rationale for the proposed policy initiatives;
- Section 3 analyses the potential benefits associated with each aspect of the NQA, drawing on the existing research and evidence base, together with conventional economic orthodoxy;
- Section 4 outlines the policy options which have been developed and modelled including variants of the National Quality Standard and the governance arrangements that support these;

- Section 5 presents the methodology underpinning the analysis and describes the data, parameters and assumptions employed in the modelling; and
- Section 6 presents the modelling results.

2. BACKGROUND

2.1 THE ECEC REFORM AGENDA

The Council of Australian Governments (COAG) is the peak intergovernmental forum in Australia, comprising the Prime Minister, state Premiers, territory Chief Ministers and the President of the Australian Local Government Association. It aims to initiate, develop and monitor the implementation of policy reforms that are of national significance and which require cooperative action by Australian (federal, state or territorial or local) governments.

A *National Early Childhood Development Strategy – Investing in the Early Years* has also been developed under COAG and announced in July 2009. The Strategy is intended to provide a comprehensive approach to building an effective early childhood development system in Australia that will contribute to the nation's human capital and productivity. The Strategy's vision for 2020 is that 'all children get the best start in life to create a better future for themselves and for the nation'.

The broad outcomes agreed by COAG in July 2009 for early childhood development are that:

- children are born and remain healthy;
- children's environments are nurturing, culturally appropriate and safe;
- children have the knowledge and skills for life and learning;
- children benefit from better social inclusion and reduced disadvantage, especially Indigenous children;
- children are engaged in and benefiting from educational opportunities;
- families are confident and have the capabilities to support their children's development; and
- quality early childhood development services support the workforce participation choices of families.

The National Quality Agenda is therefore one component in the broad policy agenda for early childhood being advanced by COAG.

2.1.1 THE PROPOSED NATIONAL QUALITY AGENDA

The reforms to ECEC proposed under the NQA are comprised of the following core elements:

- **A new National Quality Standard:** nationally consistent staff to child ratios and staff qualification requirements.
- **Enhanced regulatory arrangements:** a new regulatory model underpinned by a nationally consistent approach, which integrates the current shared regulatory responsibilities into a single, integrated framework.
- **A quality rating system:** the assignment of a quality profile to each service based on a one-to-five assessment against seven quality criteria.

The other core aspect of the NQA is the Early Years Learning Framework (EYLF), but is not within the scope of this report.

The NQA therefore aims to establish an environment in the ECEC sector conducive to the delivery of high quality care and education. By developing and applying uniform, nationally

consistent standards, the quality of ECEC will be assured in all settings and in all jurisdictions. The implementation of a quality rating system will provide parents with greater information to inform their child education and care choices, creating greater incentives for increased service quality over time. Reforming industry regulation will provide an efficient framework for the governance of the industry, ensuring that state, territory and Commonwealth responsibilities are shared in an efficient way, and in a manner that enables the delivery of high quality ECEC.

2.2 ECEC IN AUSTRALIA: AN OVERVIEW

Parents who seek care for their children have a number of different options (Table 2.1). For children aged up to four years of age, a variety of different care settings are available, ranging from formal child care services such as centre-based long day care (LDC), family day care (FDC), in-home care (IHC) and occasional care, to informal care arrangements (e.g. through grandparents or siblings). For four-year old and for some three-year old children, kindergarten/preschool programs (as stand-alone or integrated services) become available, while other formal and informal child care services continue to exist as options. Outside school hours care programs are available for school-aged children, although IHC and informal care settings continue to exist as alternative care arrangements. This shows that parents have to make two choices: firstly, about the care arrangement in general and secondly, about the care provider in particular.

TABLE 2.1: OPTIONS FOR ECEC IN AUSTRALIA

Child Care Services (Formal Care)	Preschool, Kinder or Kindergarten	Informal Care
❑ Centre-based long day care ❑ Family day care ❑ In-home care ❑ Occasional care (e.g. on an hourly basis) ❑ Outside school hours (before/after school) care programs	❑ A planned sessional educational program, primarily aimed at children in the year before they start formal schooling	❑ Care by grandparents, brother/sister, other relatives or other persons

2.2.1 FORMAL ECEC

The formal ECEC sector can be characterised as comprising: long day care, family day care, in-home care, occasional care, outside school hours care, preschool (or kindergarten as it is known in some states) and non-mainstream services. These services are described in brief below:

- **Long day care (LDC):** Long Day Care (LDC) is a centre-based form of child care service. LDC services provide all day or part-time care for children aged birth to six years who attend the centre on a regular basis. Care is generally provided in a building, or part of a building, that has been created or redeveloped specifically for use as a child care centre, and children are usually grouped together in rooms according to age. Centres typically operate between 7.30am and 6.00pm on normal working days for 48 weeks per year so that parents can manage both the care of their children and the demands of their employment. LDC centres are required to deliver an appropriate program for children. Centres are run by private companies, local councils, community organisations, individuals, non-profit organisations or by employers for their staff.

- **Preschool:** Preschool is a planned sessional educational program, primarily aimed at children in the year before they start formal schooling[4]. Preschool programs are usually play-based educational programs designed and delivered by a degree-qualified early childhood teacher. All states and territories provide funding for eligible children to access a preschool program in the year prior to school entry. In Tasmania, Victoria, Western Australia, and Queensland, the preschool year is known as kindergarten. Preschools are located at government and non-government school sites, LDC centres or local community venues.

- **Family day care (FDC):** Family Day Care (FDC) is where a professional carer provides flexible care in their own home for other people's children. Care is predominantly provided for children aged from birth to six years who are not yet at school, but may also be provided for school-aged children. Carers can provide care for the whole day, part of the day, or for irregular or casual care. In many states and territories, these carers are required to be registered with an FDC scheme[5]. An FDC scheme supports and administers a network of carers, by monitoring the standard of care provided, and providing professional advice. In some states and territories, family day carers may operate independently of a FDC scheme.

- **Outside school hours care (OSHC):** Outside school hours care (OSHC) services provide care for primary school-aged children (typically aged five to 12 years) before and after school generally operates, during school holidays (vacation care), and on pupil free days. OSHC services are usually provided from primary school premises such as the school hall and/or playground. Services may also be located in child care centres, community facilities or other OSHC centres located near the primary school. OSHC services are often provided by parent associations, or not-for-profit organisations.

- **In-home care (IHC):** In-home Care (IHC) is similar to FDC but the professional care is provided in the child's own home. IHC is not widely available and is usually only an option where other forms of care are not suitable. This usually arises in circumstances where it is difficult for the child to be cared for outside the home; for example if the child has a disability and the home is structured especially for them.

- **Occasional care:** Occasional care is a centre-based child care service that provides professional care for children aged from birth to five years who attend the service on an hourly or sessional basis for short periods or at irregular intervals. This type of care is used by parents who do not need professional child care on a regular basis but would like someone to look after their child occasionally; for example, if they have to attend a medical appointment or take care of personal matters. Occasional care is often provided as stand-alone services, within LDC services or preschools, at sport and leisure centres, and community centres. Occasional care is sometimes referred to as crèche.

- **Non-mainstream services:** There are several types of non-mainstream services. Non-mainstream services are provided by not-for-profit organisations and are delivered mainly in rural, remote or Indigenous communities, providing access to early childhood learning and child care where the market would otherwise fail to deliver. These services are subject to relevant children's services' state and territory regulations. Types of non-mainstream services include:
  - flexible/innovative services;
  - mobile child care services;

[4] In the NT, there are 5 licensed services providing sessional programs for children aged 3.
[5] Terminology differs between the states and territories. In Tasmania, a FDC scheme is also referred to as an approved registration body, while the Australian Capital Territory refers to FDC coordination units.

- Multifunctional Aboriginal Children's Services;
- Indigenous playgroups;
- Indigenous OSHC and enrichment programs;
- crèches including Jobs, Education and Training (JET) crèches; and
- neighbourhood models of occasional care.

2.2.2 SERVICES AND PLACES

Table 2.2 below shows the estimated number of licensed ECEC services by state in 2008. At a national level, the largest component of the industry is the LDC sector, which accounts for 5,927 services, or 42% of total licensed services. OSHC (25%) and preschool (30%) are also significant elements of the industry, while FDC and IHC represent a comparably small part of the sector, accounting for 2% and 1% of services, respectively.

At the state level, significant variation is observed in the composition of the industry. In Queensland, for example, LDC services account for 58% of the industry, and preschool just 13%, while in Western Australia, preschool services account for 54% of the industry and LDC just 33%.

TABLE 2.2: NUMBER OF ECEC SERVICES BY STATE, 2008

Service type	VIC	NSW	QLD	WA	TAS	SA	ACT	NT	Aust.
LDC	1,069	2,200	1,466	561	116	332	108	75	5,927
FDC agencies	75	103	75	19	11	13	5	6	307
OSHC	1,066	937	639	202	121	336	93	51	3,445
IHC	23	21	22	8	2	19	2	2	99
Preschool	1,229	852[6]	340	910	221	415	86	125	4,178

Source: Counts of LDC, FDC, IHC and Preschool services are based on state government data where provided, supplemented by the latest child care census and preschool census. OSHC service counts are based on data provided through the NCAC.
Notes: Data is point in time as provided by each jurisdiction, and hence is for illustrative purposes only. In some jurisdictions children attend preschool in long day care settings - these services have been included as long day care only.

The number of full-time equivalent (FTE) licensed places in each care setting exhibits broadly similar trends to the number of licensed services, with the industry concentrated in LDC (53% of licensed places), preschool (19%) and OSHC (17%) (Table 2.3). Reflecting the higher average number of places per service, FDC provides 9% of total places (from 2% of total services).

[6] These figures do not include non-government school-based preschool (preparatory/transition). In NSW, for example, these comprise around 150 services.

TABLE 2.3: NUMBER OF LICENSED PLACES (FTE), BY STATE, 2008

Service type	VIC	NSW	QLD	WA	TAS	SA	ACT	NT	Aust.
LDC	71,592	97,942	101,939	27,232	5,662	19,461	6,696	3,913	334,437
FDC	10,758	20,911	9,058	11,134	3,101	1,948	1,850	455	59,215
OSHC	28,877	30,054	26,403	7,235	3,062	9,699	3,502	1,660	110,491
IHC	936	1,687	1,504	738	256	1,577	70	140	6,908
Preschool	40,947	27,115	10,200	27,087	3,028	9,478	2,544	1,742	122,140

Source: Counts of LDC, FDC, IHC and Preschool licensed places are based on state government data where provided supplemented by work previously commissioned by DEEWR, and the latest Child Care Census and preschool census. OSHC licensed place counts are based on data provided through the NCAC.
Data for 2008 may not be comparable with previous years due to the change in the source for data collection.

In addition, Table 2.4 shows the number of FTE places utilised in each state and territory. While these estimates are derived from ROGS (among other sources), it should be noted that they are not directly comparable as ROGS does not report places in FTE terms. Data compiled as part of this study suggest that around two-thirds of places are utilised, however this rate varies markedly across both service type and jurisdiction.

TABLE 2.4: NUMBER OF LICENSED PLACES USED (FTE), BY STATE, 2008

Service type	VIC	NSW	QLD	WA	TAS	SA	ACT	NT	Aust.
LDC	42,239	62,683	67,280	18,518	3,964	11,871	3,951	3,299	213,804
FDC	4,823	12,547	4,644	1,161	1,746	946	629	154	26,651
OSHC	6,286	14,763	8,974	2,392	931	3,061	1,300	808	38,514
IHC	365	1,134	821	192	178	734	18	0	3,443
Preschool	40,947	25,446	10,200	27,087	3,028	9,478	2,544	1,567	120,296

Source: Access Economics based on utilisation rate data contained in CRGSP (2009) and data supplied by DEEWR and state governments.
Data for 2008 may not be comparable with previous years due to the change in the source for data collection.

2.2.3 OWNERSHIP AND STRUCTURE

As Table 2.5 shows, Australia's ECEC sector predominantly consists of private services. Across Australia, 46% of services are privately owned and operated, with the remainder shared between government and community services. Again, the composition of the sector varies between states. Western Australia, South Australia, Tasmania and the ACT are characterised by relatively large government sectors, with more than 45% of services in each of these jurisdictions government-operated. Victoria has 33% private services and 67% local government/community based services. Queensland and New South Wales have the proportionally largest private sectors, with 70% and 60% of services respectively.

TABLE 2.5: NUMBER OF SERVICES, BY OWNERSHIP TYPE, 2008

Ownership type	VIC[7]	NSW	QLD	WA	TAS	SA	ACT	NT	Aust.
Government	861	100	319	809	227	489	113	132	3,050
Community	1,471	1,264[8]	450	325	159	261	103	66	4,099
Private	1,129	2,123	1,773	566	84	365	78	61	6,179

Source: Access Economics based on CRGSP (2009) and data supplied by DEEWR and state governments.
Note: Data is point in time and hence for illustrative purposes only.

Consistent with the geographic distribution of Australia's population, around three-quarters of all ECEC services operate in metropolitan centres (Table 2.6). Outside of the ACT (where virtually all services are classified as metropolitan), NSW has the highest concentration of services in metropolitan services, with 78% of the total. Conversely, just 24% of services in the NT are classified as metropolitan, with 41% classed as regional and 37% remote. In Tasmania, 75% of services operate in regional locations.

TABLE 2.6: NUMBER OF SERVICES, BY REGION, 2008

Region type	VIC	NSW	QLD	WA	TAS	SA	ACT	NT	Aust.
Metropolitan	2,753	2,721	1,652	1,225	106	854	293	62	10,190
Regional	708	745	814	323	357	221	1	105	3,417
Remote	1	21	76	152	8	40	0	92	394

Source: Access Economics based on CRGSP (2009) and data supplied by DEEWR and state governments.
Geographic classification based on Accessibility/Remoteness Index of Australia (ARIA).

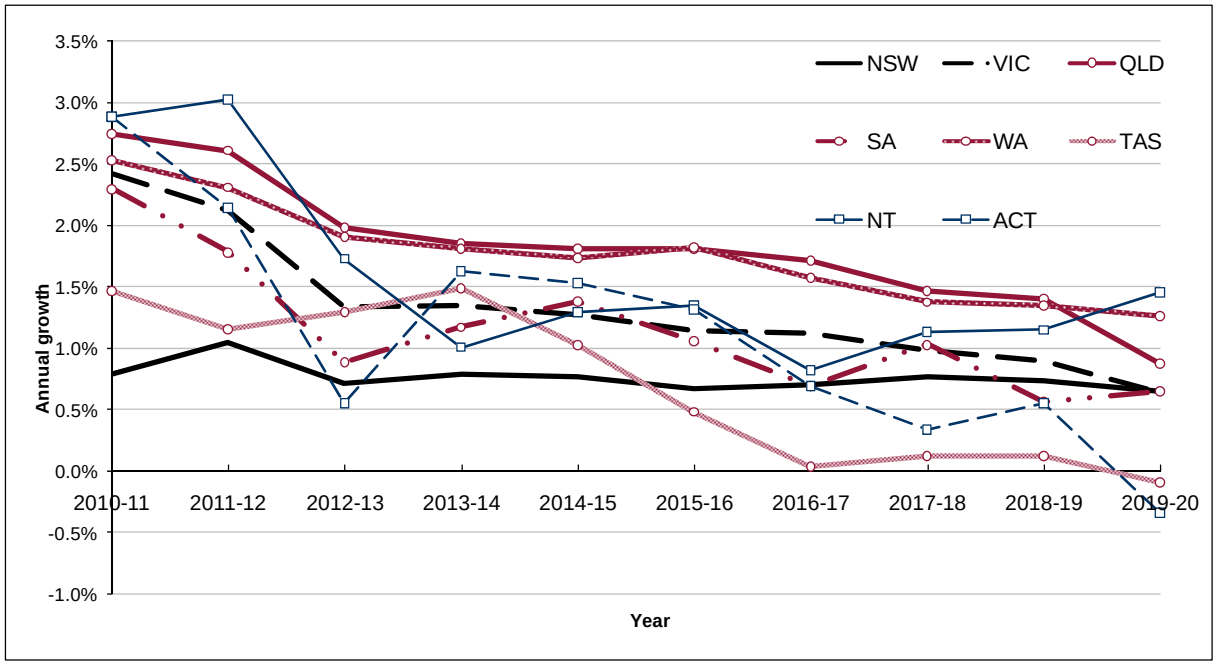
2.2.4 FORECAST DEMAND

Figure 2.1 shows the projected annual growth rates for the total number of children in formal care, based on modelling by Access Economics. That modelling reflects projected trends in the range of factors which influence parents' ECEC choices (incomes, prices, etc.) as well as underlying demographic trends. The most important demographic trends are for the population of children and in workforce participation. The generally higher growth rates in the first two years reflect a projected rebound in employment following the current slowdown. After that, the main driver is the growth in the number of children (as projected in ABS Series B). Hence, for example, the slower growth in the number of children in formal care in NSW reflects the slower growth in the population of children. As might be expected, the growth rates are more variable in the smaller states/territories.

The general trend of declining growth rates follows from the slowing of the rate of growth in parents' workforce participation observed in Access Economics' demographic modelling. Over the decade from 2009-10 to 2019-20, growth is forecast to average 1.3% annually, varying from 1.8% in Western Australia and Queensland to 0.7% in Tasmania.

[7] Does not include FDC or OSHC.
[8] This figure includes 752 government funded but community owned/operated preschools.

FIGURE 2.1: FORECAST GROWTH IN ECEC UTILISATION, BY STATE



Source: Access Economics (2009)

2.3 CURRENT REGULATORY ARRANGEMENTS

2.3.1 REGULATORY RESPONSIBILITY

The Australian, state and territory governments have different roles in supporting the provision of ECEC services. Key Australian Government activities include providing benefits, including a universal rebate for all families with children in approved care. The role of state and territory governments is broadly consistent across jurisdictions and covers responsibility for licensing and regulation of ECEC, as well as providing access to preschool, including funding, and in most cases direct provision, of preschool (refer to Box 2.1, below). All governments provide information and advice to parents and others about operating standards and the availability of services, and undertake planning to ensure the appropriate mix of services is available.

As discussed in greater detail below, overlapping requirements and differences across jurisdictions and between service types create a complex and in parts inefficient regulatory environment.

BOX 2.1: THE SHARED RESPONSIBILITY OF ECEC REGULATION IN AUSTRALIA

The Australian Government's roles and responsibilities include:

- paying Child Care Benefit (CCB) to families using approved child care services and registered care[9];
- paying Child Care Tax Rebate (CCTR) to eligible families using approved child care;
- funding the National Childcare Accreditation Council (NCAC) to administer quality assurance systems for approved child care services;
- funding organisations to provide information, support and training to approved service providers; and
- providing operational and capital funding to some providers[10].

State and territory government responsibilities include:

- licensing and setting standards for ECEC service providers;
- monitoring and regulating licensed and/or funded ECEC providers;
- providing operational and capital funding to some non-government service providers;
- delivering some services directly (especially preschool services);
- developing new ECEC services;
- providing information, support, training and development opportunities for providers;
- providing curriculum and policy support and advice, as well as training and development for management and staff; and
- providing dispute resolution and complaints management processes[11].

2.3.2 STATE LICENSING

State and territory governments currently regulate child care through state- and territory-based licensing systems. Licensing systems cover the requirements that must be met before a child care service can commence operations, and the ongoing monitoring of compliance with regulations relevant to each jurisdiction. Several jurisdictions also directly fund places.

States vary significantly both in the services that they regulate and in the specifications of their licensing requirements (i.e. the conditions which must be satisfied to obtain and continue to hold a licence). As shown in Table 2.7, some jurisdictions regulate essentially all aspects of the industry, while others only regulate small segments.

[9] For the purposes of CCB, a 'registered carer' is an individual who provides care, or proposes to provide care, for a child or children. The person can apply for approval as a registered carer to offer CCB if the individual has turned 18, or has a qualification which may determine eligibility for approval as a registered carer, and has a tax file number.

[10] Committee for the Review of Government Service Provision (2009), Report on Government Services 2009, p.3.4.

[11] Ibid.

TABLE 2.7: REGULATION AND LICENSING OF ECEC SERVICES, 2007

Service type	VIC	NSW	QLD	WA	TAS	SA	ACT	NT
LDC	L	L	L	L	L	L	L	L
FDC schemes	L	L	L	-	L	G/L	L	-
FDC carers	-	R	R	L	R	R	-	-
IHC schemes	-	-	-	-	L	L	-	-
OSHC	L	R	L	L	L	R	L	-
Occasional care	L	L	L	L	L	G/L	L	L
Preschool	L	G/L	G/L	G	G/R	G	G/R	G

Source: Expert Advisory Panel on Quality Early Childhood Education and Care (2009)
L = services are required to be licensed and meet regulations; R = services are required to be registered or approved to operate; G = services are provided by state / territory governments.
- = services do not require licence, registration or approval to operate but may be required to meet regulatory standards.

2.3.3 NATIONAL QUALITY STANDARD[12]

The states and territories also differ in the current minimum standards that they impose on staff to child ratios in licensed centres. As Table 2.8 shows, Western Australia, Victoria and Queensland currently regulate 1:4 for children under 2 years in LDC, and the other states 1:5. In the 2-3 year age group, the spread of standards is considerably wider, with South Australia mandating 1:10, New South Wales 1:8, Queensland 1:6 and the other states and territories 1:5. For children 3-5 years, most jurisdictions mandate a staff to child ratio of between 1:10 and 1:12, though Victoria currently requires 1:15.

TABLE 2.8: MINIMUM STAFF TO CHILD RATIOS IN CENTRE-BASED LDC

Age group	VIC^	NSW	QLD	WA	TAS	SA	ACT	NT	National standards
0-2 years	1:4	1:5	1:4	1:4	1:5	1:5	1:5	1:5	1:5
2-3 years	1:4	1:8	1:6	1:5	1:5	1:10	1:5	1:5	1:5
3-5 years	1:15	1:10	1:12	1:10	1:10	1:10	1:11	1:11	1:11

^ Staff to child ratio of 1:4 comes into effect for previously licensed services on 1 January 2012.
Note: In Queensland, a range of mixed age groups are available to provide flexibility to service providers.

The minimum staff to child ratios for children in FDC are shown in Table 2.9 below. All states that regulate currently impose limits of between 1:4 and 1:7 for children under school age.

[12] Information has been sourced from documentation supplied by the Quality Working Party, the Productivity Agenda Working Group, and consultation with state and territory representatives.

TABLE 2.9: MINIMUM STAFF TO CHILD RATIOS IN FDC

Age group	VIC	NSW	QLD	WA	TAS	ACT	SA	NT
0-2 years 2-3 years 3-5 years	1:7 (maximum of 4 under school age)[13]	1:7 with a maximum of five under 6 years of age	1:7 with a maximum of four under school age	Maximum of 7 children who have not commenced a secondary program; of whom not more than 5 are below the age to attend full-time schooling and at least one to be a kindergarten child	1:7 (maximum 4 under 5 years of age)	1:7 (maximum of 4 under school age)	1:7 (maximum of 4 under school age)	N/A[14]

States' regulation of preschool is equally disparate (Table 2.10). For children of preschool age (as defined), minimum staff to child ratios vary from 1:10 to 1:15. New South Wales, Northern Territory and Western Australia also prescribe minimum ratios for children of younger age in preschool.

TABLE 2.10: MINIMUM STAFF TO CHILD RATIOS IN CENTRE-BASED PRESCHOOL

Age group	VIC	NSW	QLD	WA	TAS	SA	ACT	NT
Preschool age	1:15	1:10, 3-6 years	1:12, 3-6 years	1:10, >3 years	1:12	1:10/ 1:11	2:25	1:11
Other specified age	1:4, 0-3 years	1:5, 0-2 years; 1:8, 2-3 years	N/A	N/A	N/A	N/A	N/A	N/A

2.3.4 FUNDING

The cost of ECEC is shared between state and territory governments, the Commonwealth Government and parents. States variously fund preschool and to a far lesser extent childcare places, while the Commonwealth contributes through the Child Care Tax Rebate and Child Care Benefit.

[13] Victoria is considering regulating a ratio of 1:7 (maximum of 4 under school age), consistent with the existing National Standards

[14] NT introduced new regulations on 9 June 2009. The Care and Protection of Children (Children's Services) regulations require FDC to be licensed by March 2011. The ratio is 1:7 (maximum of 2 under 3 years).

2.3.4.1 COMMONWEALTH GOVERNMENT OUTLAYS

Child Care Benefit

Child Care Benefit (CCB) is a payment made to families with children enrolled in CCB-eligible care to assist with the cost of care. The rate of CCB varies with family income, the number of children in care, the number of hours of care per week and the type of care used[15]. In 2007-08, Government outlays on CCB were $1.873 billion and in 2008-09 this figure is forecast to increase to $1.984 billion.[16]

Child Care Tax Rebate

The Child Care Tax Rebate (CCTR) is available to cover a percentage of the out-of-pocket expenses (the child care fees less the CCB entitlement) associated with approved child care for parents who are working, studying or training. From 1 July 2008, the CCTR was increased from 30% to 50% of out-of-pocket costs. Families can receive up to $7,500 per year for each child in approved care. Government expenditure on the CCTR totalled $461 million in 2007-08, however in 2008-09 this figure is budgeted to increase to $1,122 million.[17]

2.3.4.2 STATE GOVERNMENT OUTLAYS

The contribution made by individual state governments to the costs of child care varies across jurisdictions. Contributions are made in the form of lump sum allocations, per capita funding and/or fully funded government services. Based on data and information provided through state consultations, Western Australia – where the Government owns the capital stock for 37 LDC services – is the only jurisdiction to directly contribute to the cost of LDC or FDC places.

To varying degrees, all states and territories either fund or provide preschool. Jurisdictions that currently fully fund preschool include Western Australia, South Australia and the Northern Territory. Though these states place levies on parents, such payments are generally notional in value. In Queensland, the government funds around 80% of teachers' wages in kindergartens which are registered with C&K.

Table 2.11 overviews the current preschool funding arrangements by state governments.

[15] More information can be obtained at http://www.centrelink.gov.au/Internet/internet.nsf/payments/childcare_benefit.htm
[16] Australian Government Budget, 2008-09.
[17] Australian Government Budget, 2008-09.

TABLE 2.11: STATE GOVERNMENT FUNDING

	Current Funding Arrangements (2007-08)
VIC	Per capita funding at approximately $136 million per annum*
NSW	Fully funds 100 government preschools at approximately $28 million per annum and contributes $100 million per annum towards costs of 752 community preschools
QLD	Contributes 80% of teachers' and assistants' wages for preschools registered with DECKAS, at approximately $34 million per annum
WA	State funded government preschools
TAS	$13.2m for per capita funding of government preschools and subsidies for non-government schools and child care services registered as schools
SA	State-funded government preschools at approximately $75 million per annum
ACT	State-funded government preschools
NT	$23m for government preschools^

Source: Access Economics based on information provided by state governments.
^The Northern Territory also provides $5.5 million in funding for child care.
*Includes per capita, KFS and 2.4 supplement.

2.4 COMPLEMENTARY REFORMS

2.4.1 UNIVERSAL ACCESS

As part of a range of measures proposed under COAG's early childhood agenda, a commitment has been made to provide by 2013 universal access to 15 hours of early childhood education (ECE), 40 weeks per year in the year before formal schooling, delivered by a four-year university-qualified early childhood teacher. Delivery is to be in a range of settings, including stand-alone preschools and child care centres. It is also to be delivered so that cost does not present a barrier to participation. Over the longer term it is expected to result in additional preschool enrolments in the year before formal schooling. The impacts of this policy, once implemented, will depend crucially on the rate of uptake. That is, providing an additional ECE place – even where there is a shortage – does not necessarily translate into an additional enrolment; this depends on the rate at which the additional places are utilised, which is of course driven by a range of factors (e.g. parent workforce participation). In addition, the impacts, including the effects on state budgets, will vary across jurisdictions depending on current participation rates, policy and funding arrangements and the specifics of model adopted to implement Universal Access.

The benefits arising from Universal Access are distinct from those attributable to the NQA, though the two are closely linked. Universal Access will ensure adequacy of supply; the NQA will ensure the *quality* of that supply. In modelling the impacts of the NQA, therefore, it is important that only these latter benefits are captured in the modelling. In any case, modelling the impacts of Universal Access is beyond the scope of this report.

The other – indirect – impact that the Universal Access commitment has on the NQA is that it compounds the workforce challenges the industry faces. Additional enrolments and the university-qualified teacher stipulation will lead to a further increase in demand for qualified ECEC workers. The implication for the NQA reforms being that the rate of implementation may be slowed relative to what would have prevailed absent Universal Access, and industry wages are likely to be inflated, increasing the costs of the NQA reforms. Again, at this stage, these impacts cannot be estimated – and are hence not included in the modelling – as to a large extent they depend on the nature of the policy response.

2.4.2 ECEC WORKFORCE INITIATIVES

As part of the suite of reforms canvassed for the ECEC sector, COAG are considering a range of workforce initiatives to bolster the supply of ECEC labour. Naturally, the availability of qualified ECEC labour is critical to the implementation of the new National Quality Standard. Absent sufficient qualified labour, the qualification requirements associated with the new standards simply cannot be achieved within the timeframes.

A range of short and long term options have been identified by COAG for increasing the supply of ECEC which will invariably result in an acceleration in the growth of ECEC labour supply. However, given these initiatives are yet to be finalised and, even then, in many cases their efficacy will be difficult to determine *a priori*, it is not possible to definitively estimate the future rate of growth of ECEC labour.

The approach taken to capturing the proposed workforce initiatives in the modelling therefore relies on an estimate, informed by policy work conducted on behalf of COAG, of what might be an *achievable* rate of labour supply growth. This informed assumption has been determined based on historical trends, discussions with DEEWR and the workforce modelling team. Accelerating the growth in the supply of qualified labour means that the new National Quality Standard can be achieved earlier, and by extension, the present value of costs is greater.

The precise assumptions employed in the modelling are outlined in Section 6.

3. POTENTIAL BENEFITS: IDENTIFICATION AND LITERATURE REVIEW

Broadly, the potential benefits associated with the NQA fall into three categories: (i) benefits resulting from children receiving higher quality ECEC; (ii) benefits from streamlined and harmonised industry regulation – both for regulators and for the regulated; and (iii) benefits from increased workforce participation by parents.

3.1 BENEFITS OF HIGHER QUALITY ECEC

The potential benefits accruing from higher quality ECEC include the benefits relating to parents' workforce decisions, and the benefits derived from children's ECEC experience. This section overviews both of these areas.

3.1.1 PARENT WORKFORCE PARTICIPATION

One of the chief motivations for the widespread subsidisation of ECEC internationally is the recognition that parents' ability and willingness to place their children in care is key to their participation and productivity in the workforce – two factors central to the achievement of economic growth. In this instance, the NQA reforms would lead to increased workforce participation by parents if incrementally higher quality ECEC led to greater propensity for parents to place their children in care. Conversely, the reforms would be detrimental to parents' workforce participation if the increase in costs that accompanied the quality improvements reduced their willingness to use ECEC services.

Consistent with the international literature, the findings of research commissioned by the ECDS to analyse these issues suggest that cost, quality and availability of child care have no statistically significant impact on parents' labour supply decisions. One possible explanation for the results is that, in the observed data, the effects of price and quality offset each other. Nevertheless, these results are consistent with other research in the literature which finds only 'modest' effects.

On this basis 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. See Section 5.3.2 for further discussion of parents' workforce decisions.

3.1.2 CHILDREN'S ECEC EXPERIENCE

Research investigating the impacts of ECEC began early last century, and there is now a large body of evidence highlighting the benefits children, their families, and society more broadly derive from these services. Parallel to this growing body of literature has been an increasing number of government-run programs worldwide providing researchers with additional quantitative results with which to analyse the impacts of ECEC. This section draws on this research and evidence to present an overview of how the benefits accruing to children from the proposed National Quality Standard might reasonably be quantified in a cost benefit analysis framework. In this sense, the emphasis is on those studies that provide a basis for attributing a dollar-value to the benefits resulting from changes in structural quality.

A major contribution of these findings has been the demonstration that quality ECEC programs have returned positive cost-benefit results, in particular through their role in building human capital and reducing the adverse impacts on society of at-risk children. The

implication for policy has been that ECEC programs are no longer viewed as being provided out of a moral obligation towards children, but also as realistic economic packages that provide long-term benefits to government budgets and labour productivity.

However, while research has shown that certain programs have returned positive cost-benefit results, there is as yet insufficient information to conclude which aspects or characteristics of a program underlie this success. For example, Phillips et al (2007) state that:

> *'There is a dearth of research focused on pre-K environments that looks inside the pre-K "black box" to identify the specific practices and characteristics of programs, classrooms and teachers that contribute to the pattern of promising results that the Oklahoma program and others have been reporting.'*

Reviews of the literature typically conclude that improvements in the structural parameters of quality are responsible for a large part of these findings. However, until a broader scope of research is available, enabling a full investigation of the drivers of positive outcomes, only indicative support can be given for particular aspects of ECEC policy, and in particular the magnitude of their impacts.

This presents a particular problem for policy-makers who are forced to choose between different elements of potential ECEC program design. Nonetheless, some important large-scale longitudinal studies are beginning to provide some evidence on the causal impacts of certain structural parameters, and are likely to shed more light on the impacts of ECEC as they follow participants into adulthood.

Regardless of these issues, the literature does contain some instructive research on the drivers of positive childcare outcomes. This research focuses on the regulatory aspects of quality provision, referred to as *structural quality*, and typically comprises staff to child ratios, group size and teacher qualifications. However, the literature provides little in the way of concrete guidance for policy-makers as to the distinct, relative or marginal contribution of identified factors. The identified factors are common and broadly agreed, but the attributed results are often ambiguous or contradictory, and are difficult to generalise. Again, the lack of consistency between the research makes it difficult to pin down quantitative estimates of the benefits. Although a plausible range in which the true benefits might fall could be constructed, this would be large, contain negative values, and provide little guidance for policy makers.

A related problem is that quality itself is a somewhat nebulous concept. An appropriate definition would appear to consider quality as any variable which increases the chance of achieving a program's goals, whether these are improved child well-being, educational attainment or lifetime earning prospects. However, these variables are often difficult to measure, particularly over the short term. As a result, proxies for quality are used, including variables with identifiable and testable outcomes such as IQ, standardised test scores or a myriad of other similar performance measures. Whether, and to what extent, these measures provide a true proxy for the "success" of ECEC programs is unclear from the literature.

This literature review scans the published evidence such as it is. Most has been derived from US studies of intensive targeted programs, and while the data provided by these programs are rich, for the current task they must be interpreted in an Australian context where ECEC provision differs in structure. Further, the literature on ECEC is not primarily drawn from economics. Hence, translating the findings into quantitative measurements useful for a cost-benefit analysis (CBA) is an obstacle. Whilst there is generally positive

support for improving structural aspects of quality, there is little to guide quantitative assessments of changes in these variables. These and other issues are discussed below.

3.1.2.1 TARGETED VS UNIVERSAL ECEC

The literature distinguishes two broad types of ECEC program: universal programs aimed at providing education and care indiscriminately within a jurisdiction; and targeted programs which select a certain demographic to participate in the program. The majority of the programs reviewed in the literature are drawn from the latter group. These programs consist almost exclusively of US programs targeting ECEC participation at high-risk children. High-risk in this context usually implies low socio-economic status but may refer to other aspects of the child's background such as parents' education, neighbourhood of residence, parents' marital status and cultural background.

Reviews of targeted programs generally find high benefits accruing both to participants and society. Indeed, cost-benefit ratios for these programs are typically high, falling in the range of 2:1 to 17:1. However, the benefits considered are typically idiosyncratic to the particular group being targeted and would not necessarily be experienced in a broader sample.

From this perspective, it is important that any CBA is modelled on the service being provided; modelling a universal ECEC program based on results from targeted interventions will be misleading in the absence of appropriate adjustments. As Penn et al (2006) argue:

> *'If the government is considering a more universal service, economic approaches modelled on targeting may be irrelevant…'*

Whilst it is unlikely that nothing can be learned from the impacts of the targeted programs, it is more plausible that the results are highly magnified when compared to more universal programs. The key emphasis should therefore be on adjusting any findings to accurately fit within the context in which the ECEC program is being provided.

Nonetheless, the literature's focus on targeted programs is to some extent unfortunate from the perspective of assessing the likely benefits from the provision of high-quality universal early childhood education and care. Though the literature comprises some studies of universal provision of ECEC, the findings are typically less positive than those of targeted US programs. Indeed, in summarising the literature on universal ECEC, Andrew Leigh (2006) concludes that '*Universal programs are unlikely to have high benefit/cost ratios'*.

This is a common theme among papers which have reviewed such programs. Karoly and Brigelow (2005) review the literature on universal ECEC and other programs not specifically targeted at high-risk children and conclude that:

> *'Evidence of the potential impacts of such a preschool program on more-advantaged children is less conclusive. The most convincing evidence suggests that the effects of preschool on school readiness are likely to be smaller for more-advantaged children compared with their less-advantaged peers.'*

Just how much smaller the benefits for low-risk children are likely to be is an important question. Few studies are available to answer this question, and only one has been identified which can provide an empirical estimate. The Nurse Family Partnership program in the US recorded results for both high- and low-risk participants, with the cost-benefit ratio for the high-risk group being 5.70 and that for the low-risk group being 1.26[18]. In other words,

[18] See Karoly et al (2005), page 109 for details.

low-risk children received only 22% of the benefits per unit cost which high-risk children received.

Further, in targeting specific high-risk children, targeted programs may be designed differently from a typical universal ECEC program. Many programs attempt to address the cultural deprivation of participants, while simultaneously addressing deficiencies in upbringing at their source by involving parents in the program. For example, in their comprehensive review of the research, Karoly et al (2005) review 20 programs, 19 of which incorporated an element of home visitation. The design and content of such programs is likely to bias the effects on children compared with a universal program.

The implication is that care must be taken in interpreting the results in the literature. Many of the programs often quoted, and particularly those demonstrating high benefit-cost ratios, are targeted programs which bear little relevance to the current Australian policy context.

3.1.2.2 WHICH BENEFITS ARE COVERED?

The literature identifies many benefits of high quality ECEC, in particular for disadvantaged children. These include but are not limited to:

- higher adult earnings;
- higher college and high school completion rates;
- lower crime rates;
- reduced reliance on welfare;
- reduced grade repetition and use of special education;
- improved child well-being as measured by various metrics;
- spill-over benefits to peers and the community more generally; and
- intergenerational spill-overs.

Program reviews typically measure a subset of these potential benefits. This is at least partly due to the fact that the likely benefits of a program are highly dependent on the nature of its design and the participants chosen. For example, the oft-quoted analysis of the Perry Preschool Study returned a benefit-cost ratio of 17:1, the vast majority of which related to a reduction in crime in the treatment group. This program comprised 123 African American children from low-income backgrounds, split into control and treatment groups. In the control group, 55% had been arrested five times or more by the age of 40. This figure had fallen to 36% in the treatment group. Other studies have found that crime rates were not significantly altered through attending an ECEC program, or simply disregarded reduced crime rates as a potential benefit due to the low crime rates in the chosen groups.

However, in large part these benefits are often disregarded through the difficulty in reliably measuring outcomes. To this end, Karoly et al (2005) conclude:

> *'the primary impetus for early childhood intervention is in fact generally outside the scope of the benefit-cost arguments that have been cited so often as justifications for public or wide-scale investments in early childhood'.*

And further, on page 61:

> *'An important footnote in terms of "what we know" about the effects of early childhood intervention is that many evaluations did not measure outcomes in the domains of health, child maltreatment and crime'.*

This is a common theme in CBAs where benefits need to be translated into dollar amounts to enable comparability with costs. This is especially relevant in the case of ECEC where many of the potentially important benefits are not readily quantifiable (e.g. child well-being) or are quantifiable but not easily translated into benefits (e.g. IQ at a young age).

Hence, it is important that care is taken in selecting the benefits to be measured in any analysis of a program. It is likely that some of the benefits are not directly related with the structural quality of the ECEC provided, and may instead flow from the interaction of the children with peers and adults generally, a general increase in stimulation compared to poor home environments, and the impacts of other intervention such as home visiting and parent effectiveness support. Other benefits, particularly those related to educational and cognitive outcomes, are more likely to be affected by program quality and therefore be more relevant to the current context.

3.1.2.3 MEASURING THE IMPACTS

The range of different benefits considered in the ECEC literature means that there is no common unit in which outcomes are measured and reported. For educational performance, authors have measured outcomes such as grade retention or high school completion; for cognitive performance, IQ or standardised test scores have typically been used; while for health improvements, measures such as cortisol levels are reported. Only some of the more recent papers which assess the economic impacts of selected ECEC programs report the benefits in dollar terms.

This lack of a common metric makes comparison difficult when focusing on different outcomes or different variables to measure the same outcome. Some authors have attempted to avoid this by reporting percentage changes in variables, or by reporting whether a variable was found to be statistically significant. However, these approaches do not allow meaningful comparisons of the relative size of the effects.

To circumvent this, many authors, particularly those focussed on reviewing a range of programs, have used a measure of *effect size* to allow for the comparison of impacts across programs assessing different variables. The 'effect size' of a program variable is the standard deviation of the mean outcome for the treatment group from the control group mean. It is calculated by dividing the difference in the means of the two groups by the standard deviation of the variable measured. For example, an effect size of 0.5 implies that children participating in that program achieved a group mean 0.5 standard deviations above the mean of those who did not participate. Hence, effect sizes allow a unit-less comparison of the relative size of impacts to be made.

Differences in effect sizes can be due, to some extent, to the design of the program review. It is subject to the usual statistical caveats such as the size and underlying characteristics of the sample populations, implying that differences in effect sizes may be partly due to the conduct of the research and not purely a result of the program effect. Nonetheless, researchers have typically placed indicative scales to effect sizes, classifying effect sizes of less than 0.2 as 'small', those close to 0.5 as 'medium' and those greater than 0.8 as 'large'. Where possible, the reported effect sizes of various programs are reported below.

3.1.2.4 STRUCTURAL QUALITY

The structural quality of an ECEC program is important, and the balance of the literature suggests that improvements in teacher qualifications and staff to child ratios enhance outcomes from ECEC. Several studies have identified the benefits of high-quality programs, while others have suggested that low-quality programs may be detrimental to the well-being of participants. However, apart from discussion in these rather general terms, there is little in

the literature to suggest exactly what is meant by high-quality ECEC, which variables increase the quality of programs, or what a sufficient or optimal level of quality might be. Karoly and Kilburn (2008) state that:

> *There is little information about how much the monetary benefits of early childhood programs will rise as quality is increased and whether the increase in the monetary value of program benefits as quality increases will be sufficient to offset an increase in project costs associated with higher quality. Furthermore, there may be minimum threshold levels of quality required to realise any benefits of early childhood services, meaning that trading off quantity for quality has different implications for program benefits at lower versus higher levels of program quality.*

The general conclusion surrounding the provision of quality ECEC is also somewhat equivocal and suggests that what is most important is the quality of the interaction between the staff and children (an element of so-called 'process quality'). This itself is a function of the amount of time spent one-on-one with children and how this time is spent. The Effective Provision of Preschool Education (EPPE) longitudinal study, detailed in Sylva et al (2003), and the NICHD (2002) longitudinal study both emphasised the role of structural quality operating *through* its impact on process quality, not on the outcomes of ECEC directly. That is, it is the quality of teachers that matter, improving structural quality simply allows this effect to passed on to children more readily.

In addressing issues of quality, policy-makers have typically focussed on those variables which can be easily regulated, observed and quantified, including teacher qualifications, group sizes and staff to child ratios. Several papers have reviewed the effectiveness of these structural quality variables, and typically reveal mixed but generally positive results. Karoly et al (2005) summarise the positive association of quality with these structural variables in concluding that:

> *'A very limited evidence base points to several program features that may be associated with better outcomes for children: better-trained caregivers, smaller child-to-staff ratios, and greater intensity of services'*

The championing of structural quality parameters holds intuitive appeal. If positive results are achieved through more one-on-one time between teachers and children, then lower group sizes or lower staff to child ratios would seem to be warranted. Further, with the literature concluding that it is the way a teacher uses one-on-one time that matters, then it would seem likely that more qualified teachers would be better positioned to achieve this. The following sections examine the evidence.

Teacher qualifications

Teacher qualifications may be defined in several ways, including the highest level of educational attainment and the degree major of the teacher. The literature generally finds a positive association between teacher qualifications and cognitive and educational outcomes of children. However, there remains a question mark over whether the link is causal or merely marking a correlation. The complicating factors are raised in many of the reviews of the literature on structural quality, such as Early et al (2006) who state:

> *'The relation between teachers' education and quality classrooms is sometimes evident only when simple analysis techniques are utilised, and the relationship weakens when a more complex model is used.'*

Further, as remarked above, it is generally found that the defining link between teachers and child outcomes is through the way in which teachers interact with children. For example, Xu and Gulosino (2006) conclude:

> *'The behavioural aspects of teaching appear to shape the transformation from a mere 'qualified' teacher into a 'quality' teacher…'*

Hence, it would appear that the structural aspects of quality are not solely responsible for positive outcomes, but rather the way in which structural quality improves process quality, and through that the educational experience. NICHD (2002) test this hypothesis using structural equation modelling and conclude that teacher qualifications have a positive impact on process quality and ultimately on child outcomes.

Many researchers point to the difficulty in interpreting results across different papers, and the fact that many results are seemingly contradictory or inconclusive. Notwithstanding, literature reviews attempt to extract indicative findings by looking at the issue across a wide range of scenarios. Several such reviews are discussed below.

Xu and Gulosino (2006) conclude that there are mixed findings about the effect of teacher qualifications. They stress that quality is a function of several variables, such as parent-teacher interactions and other process-related variables, and that these have not been sufficiently accounted for in the literature. Furthermore, in a review of the literature on the effect of teacher qualifications on K–12 student outcomes, Wayne and Youngs (2003) conclude that there is little evidence of improved outcomes, with the exception of mathematical skills in high school years.

In a recent review of the literature on structural quality, Huntsman (2008) concludes that:

> *'the link between levels of caregiver education and/or specialised qualifications, process quality and child outcomes is perhaps the strongest in research on quality'.*

Huntsman supports this view by citing research by Burchinal, Howes and Kontos (2002) who, after reviewing data from over 300 child care homes, found that teacher qualifications consistently predicted quality, while neither staff to child ratios nor group size were found to be significant.

The Effective Provision of Preschool Education (EPPE) Program, a celebrated longitudinal study of childcare provision in the UK, also finds in favour of teacher qualifications above other indicators of structural quality. For example, Sylva et al (2003) state:

> *'Settings which have staff with higher qualifications, especially with a good proportion of trained teachers on the staff, show higher quality and their children make more progress.'*

Early et al (2007) come to a starkly different conclusion, stating in regard to the literature on teacher qualifications that:

> *'The findings indicate largely null or contradictory associations, indicating that policies focused solely on increasing teachers' education will not suffice for improving classroom quality or maximising children's academic gains. Instead, raising the effectiveness of early childhood education likely will require a broad range of professional development activities and supports targeted toward teachers' interactions with children.'*

Early et al's analysis was based on a detailed study of seven ECEC programs in the US, and tested the impact of teacher qualifications on a range of quality measures. They conducted 27 analyses on these studies looking at whether teachers with bachelor degrees recorded higher quality scores than those without. They found that only eight of these analyses yielded any evidence of an association, and two of these were negative. Further, there was large variation across the studies, with effect sizes ranging from -0.26 to 0.68.

Staff to child ratios

As with other elements of structural quality, the international literature on staff to child ratios is rich. Currie and Neidall (2003) study the effectiveness of the Head Start program in the US. In particular, they review different allocations of funding between centres and use this allocation bias to assess where funding is most beneficial. They find that centres with higher staff to child ratios achieve better outcomes for children; however, no significant association was found between teacher qualifications and outcomes[19]. Their results also stress the importance of the health of children, with centres which devoted funding to health-related outcomes recording more positive results than other centres.

In 1985 the Tennessee Student/Teacher Achievement Ratio Study (STAR)[20] attempted to provide experimental evidence of the impact of reducing class sizes and increasing staff to child ratios. This program randomly assigned early school age children to small (13-17 students) and regular (22-26 students) classes and measured educational outcomes. The study found that children in the smaller classes performed better in all areas of measurement but with small effect sizes of 0.2. It is not clear how this finding would translate into a modern Australian ECEC context with incremental increases in staff to child ratios, such as those currently proposed.

In a similar study, although not experimental, the Wisconsin Student Achievement Guarantee in Education (SAGE) program investigated the effects of reducing class sizes to 15 students per teacher in selected low-income areas. This study found significant improvements in standardised test scores from participants.

Also finding generally positive results, Huntsman (2008) concludes that the literature generally points to higher staff to child ratios increasing the quality of ECEC, stating:

> *'While there have been some studies with contradictory results…the weight of evidence favours a conclusion that child-adult ratio in a child care setting is significantly associated with quality.'*

However, Huntsman reiterates the common concern surrounding the inadequacy of some of the research methods employed in the literature, particularly poor experimental design. In identifying effects and drawing conclusions, the studies rely on correlation and do not demonstrate causation. Where effects are found generally it is not possible to isolate the contributing elements or demonstrate their relative contribution to effects. She finds only two experimental studies, only one of which reports a significant relationship between ratios and outcomes, with only relatively small effect sizes found.

As with much of the research on structural parameters, there is little emphasis on the existence of threshold effects, or the general non-linearity of changes in variables. That is, it

[19] It is worth comparing this result with that of Burchinal et al (2002) on the previous page. This paper found the opposite to Currie and Neidall (2003), namely that qualifications lead to improved outcomes but the impacts of ratios were insignificant. Inconsistencies like this are common in the literature and make quantitative estimates based on individual studies difficult and unbalanced.

[20] Information on this program and its findings can be found at: http://www.heros-inc.org/summary.pdf

is unclear whether minimum ratios must be met before gains are achieved, or whether increasing ratios past a certain point achieves no further gains. Phillipsen et al (1997) provides some evidence here, finding that the incremental gains from increasing staff to child ratios decrease (i.e. in this sense, there are diminishing returns to quality).

Group size

Studies focussing on group size typically find fewer associations with positive outcomes of ECEC than those focussing on the other aspects of structural quality. The studies are also commonly confounded with these other aspects, making it difficult to isolate the impact of group size reductions. Along these lines, Huntsman (2008) concludes:

> *'While group size appears to be less significant than other structural variables, its impact is difficult to tease out as research on this variable is often combined with others eg staff qualifications and training or child-adult ratio.'*

A common difficulty encountered is that reducing group size increases staff to child ratios and any resulting benefits may be due to this latter effect. It is worth noting that, in the SAGE program outlined above, although reduced group sizes were found to lead to significantly improved educational outcomes, there was found to be no difference between students in classes with 30 students and 2 teachers and those in classes with 15 students and 1 teacher. Hence, it appears that the benefits arose from a higher staff to child ratio, not from reductions in class size *per se*.

There are some intuitive reasons why reduced group size may improve outcomes, independently of the effect on ratios. Smaller groups are likely to have fewer interruptions and disciplinary issues, allow teachers to form closer personal bonds with children, target teaching more appropriately and reduce teacher stress levels. Nonetheless, the inconclusive findings from the literature indicate that these impacts are relatively minor.

In a review of the literature on class size reduction, the School Board of Broward County, Florida concludes that:

> *'The majority of research conducted on class size reduction (CSR) has shown inconsistent effects on achievement.'*

The review highlights the lack of rigour in the research conducted in the field and argues that there is insufficient evidence on which to base a policy case for reductions in class size, going so far as to argue that *'merely decreasing class size without fully understanding the full effects of CSR on achievement may be more costly than beneficial'*.

3.1.2.5 NON-STRUCTURAL IMPACTS ON QUALITY

As part of the NQA there will also be additional changes to non-structural quality parameters. These include improvements and uniformity relating to program design and teacher-student relationships. As such, these are likely to impact on teaching quality more directly through process quality.

The literature on process quality is somewhat vague, perhaps necessarily so as process can mean different things in different settings. Nonetheless, some clear and consistent conclusions can be drawn. Research tends to find that the nature of the interaction between teachers and students is important, with situations where children are challenged and asked to think for themselves typically resulting in improved cognitive and literacy outcomes. Improved curriculum can also help facilitate these responses.

There is also evidence that the environment (both physical and emotional) in which teachers operate can affect their attitudes towards teaching and, through this, the effectiveness of their teaching. Environmental issues are also identified as being important for participants, with research identifying the need for programs which combine constructive social engagement between children in addition to the cognitive aspects of a curriculum.

3.1.2.6 OTHER BENEFITS OF HIGHER QUALITY ECEC

The literature identifies a number of areas where children or society may benefit from higher quality ECEC. These benefits are listed above, and this section provides a more detailed discussion. As above, it is important to place emphasis on the likely impact of incremental improvements in structural parameters, not on the impact of ECEC participation alone.

Improved health outcomes

Most jurisdictions list improved child 'health and welfare' among the goals of their ECEC services. While the majority of the literature focuses instead on cognitive outcomes, some studies have attempted to isolate the health impacts of quality ECEC. A recent trend in this direction has been a number of studies attempting to identify changes in cortisol levels in children who participate in an ECEC program, with this used to indicate stress levels and associated health impacts.

In their review of the literature on health impacts of ECEC, Mitchell et al (2008) conclude that:

> *'Overall, the picture from research to date of health outcomes for children from ECE experience is not solid.'*

They identify eleven studies which report on health impacts from ECEC participation. Of these studies, five find a positive relationship and six find no relationship. Some studies also report negative outcomes in some aspects of health, for example one finds higher cortisol levels in babies while others find higher levels of infections. The former is in line with other studies which have shown that low quality care may be detrimental to babies, while the latter is found to result from higher levels of exposure to infections from children who attend ECEC.

There is little evidence to suggest which aspects of education and care support improved health outcomes, although some papers suggest that those programs with targeted health components achieve better health outcomes. Child stress levels on the other hand may be linked more closely to process quality. Overall it is difficult to conclude whether improvements in teacher qualifications or staff to child ratios are likely to improve outcomes.

However, there may be a closer link between higher income resulting from higher quality ECEC and health outcomes. A large literature has drawn a relationship between income and health in a wide cross section of the international community. This literature shows correlation between these variables, and typically concludes that causation runs in both directions (i.e. higher income leads to higher health, and higher health leads to higher income). The exact magnitude of the effect of higher income on health outcomes is difficult to determine and is beyond the scope of this review[21]. However, it can be concluded that through its impact on income levels, higher quality ECEC does result in some health benefits. As with most benefits accruing from ECEC, it should be noted that health outcomes are found to improve greatest in middle age, and the present value of these benefits are likely to be small.

[21] Some studies have attempted to estimate this link quantitatively, for example the NBER (2003) estimates that for a 1% rise in income, mortality will fall by around half of one per cent.

Lower crime rates

Reductions in crime rates have been calculated by several of the major international studies. Indeed the Perry Preschool study found that justice system savings derived from high quality programs targeted at disadvantaged children and their families accounted for the vast majority of the benefits reported in its 17:1 benefit-cost ratio. The following table from Mitchell et al (2008) summarises the findings on crime rates.

TABLE 3.1: IMPACTS OF TARGETED HIGHER QUALITY ECEC ON CRIMINAL ACTIVITY^

Measure	*Perry High Scope**	*Chicago Child Parent Centres***	*Abecedarian****
Ever arrested by age 27	E<C; E=57%, C=69%		
Lifetime arrests through age 27	E<C; E=2.3, C=4.6		
Delinquency rate at age 13–14		E<C	
Crime rate age 16–21			E=C
Juvenile court petitions through age 17		E<C; E=16%, C=26%	
Violent offences by age 17		E<C; E=9, C=15.3	
Child abuse and neglect		E<C; E=5%, C=10.3%	

* Figures from Karoly *et al.* (2001, p. 51)

** Figures from Karoly *et al.* (2001, p. 53) and Reynolds *et al.* (2002, tables 1, 2 and 4).

*** 3 Figures from Masse and Barnett (2003, Tables 8.1 and 8.7).

^Taken from Mitchell et al (2008).

Given the costs to the justice systems imposed by criminal activities, even small changes in crime rates can result in substantial savings. However for a number of reasons, reductions in crime rates are not likely to be significant for the current regulatory changes. Firstly, the impacts found in the three targeted studies noted in the table above are likely to greatly overstate the impacts in the current context as:

- these studies comprised a majority of African American children, and African Americans are approximately five times more likely to be incarcerated than white Americans;
- they are targeted studies and focus primarily on children from low income families, and there is typically found to be a strong linkage between income and crime; and
- crime rates in the US are generally higher than in Australia, although this depends on the type of crime.

Secondly, there is no indication in the literature as to which aspects of ECEC cause the reduction in crime rates. It may be that the social skills learned in a formal early educational setting are important, or the disciplinary environment and interaction with authority. Overall, it appears unlikely that changes in structural parameters will have a significant impact on crime rates in participants.

Impact on education system costs

Several studies have identified the impacts of targeted higher quality ECEC on educational attainment. This is broken up into two broad impacts:

- reduced grade retention and use of special education; and
- higher completion rates of key education milestones.

The distinction between these impacts is important. Reduced grade retention and special education represent a benefit to the government and community generally, as this reduces the required funding for the education system. Increased educational attainment on the other hand represents a cost, as this implies longer time spent in the education system (imposing higher costs on the government), and less time in the workforce (imposing costs in terms of foregone earnings)[22]. The extent to which educational impacts confer a net benefit or costs therefore depends on the relative magnitudes of these effects.

Studies which have identified these impacts, and found the largest results, are typically those investigating targeted programs in the US. Mitchell et al (2008) provide the following summary.

TABLE 3.2: IMPACTS OF TARGETED, HIGHER QUALITY ECEC ON EDUCATIONAL ATTAINMENT^

Measure	*Perry High Scope**	*Chicago Child Parent Centres***	*Abecedarian****
Special education by age 9		E<C; E=8%, C=9%	
Special education (yrs) through age 14		E<C; E=0.6, C=0.9	
Special education (yrs) through age 18		E<C; E=0.7; C=1.5	
Years retained in grade by age 15			E<C; E=31%, E=55%
Special education by grade 9 (age 14)			E<C; E=25%, C=48%
Time in special education by age 19	E<C; E=16%, C=28%		
Years in special education to age 27	E<C; E=1.1, C=2.8		
High school completion	E<C; E=49%, C=39% (by age 21)	E<C; E=50%; C=39%	E<C; E=67%, C=51%
High school graduation to age 27	E<C; E=66%, C=45%		
Post-secondary education	E<C; E=33%, C=28% (credits by age 27)		E<C; E=36%, C=13% (college enrolment by age 21)

* Figures from Karoly *et al.* (2001, p. 51)

** Figures from Karoly *et al.* (2001, p. 53) and Reynolds *et al.* (2002, tables 1, 2 and 4).

*** 3 Figures from Masse and Barnett (2003, Tables 8.1 and 8.7).

^Taken from Mitchell et al (2008).

These studies draw similar conclusions. The CCPC study finds that children in that program spend around 0.8 years (slightly less than half) less time in special education by the age of 18 than those who did not participate. The Perry Preschool study finds that 16% of participants require special education by age 19 compared to 28% for the control group. In

[22] While increased educational attainment ultimately confers benefits in terms of increased productivity, these benefits are already counted in terms of higher incomes.

terms of grade retention, the Abecedarian study found that grade retention fell from 55% for the control group to 31% for participants.

As would be expected, education completion rates were higher for participants than non-participants. High school completion rates rose by similar magnitudes (10 to 16%) in each of the three studies, while the Abecedarian study revealed college enrolment almost tripling by age 21.

More extensive longitudinal research covering universally higher quality ECEC would be required to convert these findings into likely outcomes in a universal ECEC environment in Australia, and consider the relative costs of providing education in different environments (for example, primary school versus university). However, as a rough approximation it may be expected that the two costs will cancel each other out, with the implication that there are no net benefits from increased educational attainment from incremental increases in the quality of ECEC.

Impacts on the welfare system

An oft-cited gain of improved education is the reduced reliance on welfare by participants. To the extent that higher quality ECEC raises the future incomes of participants, it may be expected that calls on welfare would be reduced. This will depend on:

- the number of participants who gain materially from the higher quality care; and
- whether these recipients would have received welfare payments in absence of the NQA reforms.

This effect is difficult to estimate *ex ante*, however the anticipated rise in incomes will provide some measure of the likely gains. Although reduced welfare is undoubtedly a positive outcome from a social perspective, from an economic perspective the benefits are less clear. Welfare payments comprise a transfer of wealth from higher income earners to low income earners through the public welfare system. That is, there is no net creation of wealth, and therefore these payments would not represent a 'benefit' in a CBA sense.

3.1.2.7 COST-BENEFIT ANALYSES IN THE LITERATURE

Although studies on structural quality parameters provide an indication of the likely magnitude of the regulatory changes being considered for Australia, they do not provide a direct indication of how to convert effect sizes into dollar values. For this it is necessary to turn to various CBAs which provide financial measures of the benefits of ECEC programs. As noted above, these studies have typically considered targeted programs, which hold only limited applicability to the incremental improvements in structural quality for universal programs proposed in Australia.

Table 3.3 provides an extract from Karoly et al (2005) on ECEC CBAs. It presents a comprehensive stocktake of the analyses to date, as well as some useful comparisons between programs.

The benefits accruing from these programs have been split between those received by the participant and those received by the rest of the community. In the majority of cases the benefits accruing to parties other than the participant are the larger of the two. This is due in large part to the targeted nature of the programs being analysed, where improving outcomes for high-risk children leads to benefits associated with reduced crime, reduced reliance on welfare and reduced educational spending in the form of grade repetition and special education. These benefits would not be expected, or at least not to the same extent, in

either universal programs dealing with largely low-risk children, or where only incremental changes are made to existing programs.

Further, there is no common set of benefits included in these programs. Where some include benefits accruing to parents or descendents of the participant, others focus on impacts on government outlays. In studies which account for the impact on crime, some papers focus on the costs to the justice system, while others attempt to include the cost of the crime to the victims in terms of lost well-being. As such, there is no single comprehensive CBA present in the literature including all of the likely benefits expected from a prospective program. Instead, the literature affords a menu of indicative measures which may be used to inform policy decisions for similar programs.

The second column of Table 3.3 indicates the age of the participants at the time when the CBA was conducted. Almost all of the studies are conducted on a retrospective basis: that is, they estimate the costs and benefits to society based on observed outcomes at the age of last follow-up, and do not forecast continued gains into the future. One implication of this is that studies with later follow-up ages typically reveal higher benefit-cost ratios as they allow more time for the benefits to accrue.

TABLE 3.3: COMPARISON OF ECEC COST-BENEFIT ANALYSES

Program	Age at Last Follow-Up	Program Cost ($)	Distribution of Benefits ($)			Total Benefit to Society ($)	Net Benefit ($)	Benefit-Cost Ratio
			Participants	Government Savings	Rest of Society			
Comprehensive Child Development Program: Case managers provide coordinated services to low-income families with children under 5	5	37,388	91	–101	0	–9	–37,397	—
HIPPY USA: Paraprofessionals provide home visits to disadvantaged families with children ages 3–5	6	1,681	1,940	485	607	3,032	1,351	1.80
Infant Health and Development Program: Home visiting and center-based child development program for low birth weight babies from birth to age 3	8	49,021	0	0	0	0	–49,021	—
NFP (full sample): Public-health nurses provide home visits to low-income first-time mothers from prenatal period to age 2	15	9,118	2,674	9,548	14,075	26,298	17,180	2.88
NFP (higher-risk sample): Public-health nurses provide home visits to low-income first-time mothers from prenatal period to age 2	15	7,271	1,277	32,447	7,695	41,419	34,148	5.70
NFP (lower-risk sample): Public-health nurses provide home visits to low-income first-time mothers from prenatal period to age 2	15	7,271	2,051	5,095	2,005	9,151	1,880	1.26
Home visiting for at-risk mothers and children (meta-analysis): Average effect across 13 home visiting programs	Varies	4,892	6,194	1,815	2,960	10,969	6,077	2.24
Abecedarian Program: Comprehensive, center-based child development program for at-risk children from infancy to age 5	21	42,871	NA	NA	NA	138,635	95,764	3.23
Chicago CPC: Center-based, one- or two-year, part-day academic-year preschool program with parent participation	21	6,913	22,715	19,985	6,637	49,337	42,424	7.14
Perry Preschool Project: Center-based, one- or two-year, part-day academic-year preschool program with home visiting	40	14,830	61,866	191,288		253,154	238,324	17.07
Early childhood education for low-income 3- and 4-year-olds (meta-analysis): Average effect across 48 preschool programs	Varies	6,681	6,036	4,329	5,377	15,742	9,061	2.36

SOURCE: Adapted from Karoly, Kilburn, and Cannon (2005, Table 4.4).

NOTE: All dollar values are 2003 dollars per child and reflect the present value of amounts over time where future values are discounted to age 0 of the participating child, using a 3 percent annual real discount rate. NA = not available. Meta-analysis is from Aos et al. (2004).

Of most interest for the CBA conducted in this report is the impact which ECEC has on employment prospects, and in particular lifetime earnings. As shown above, only one study, the Perry Preschool Study, follows participants past the age of 21. Not surprisingly this appears to be the only study in the literature which provides a measure of increased earnings based on observed outcomes. This study has received much attention, partly due to the comprehensive nature of the analysis and length of follow-up, but perhaps more as a result of the reported benefit-cost ratio of 17:1.

This study reviewed a targeted program consisting of 123 African-American children who were from low-income backgrounds and at high risk of school failure. They were also far more likely to commit crimes, with 55% of the control group arrested five or more times by the age of 40. The CBA conducted by Schweinhart (2005) estimates an economic return per participant of US$244,812 in 2000 dollars. Eighty per cent of this return accrued to the general public, 88% of which resulted from lower crime, 4% from educational savings and 7% from higher tax receipts. Only US$49,190 of the total benefit accrued to participants, inferring a benefit-cost ratio of 3.2:1 if public benefits are excluded.

While several of the studies in the literature provide insight into employment prospects of participants in early adulthood, only the Perry Preschool Study quantifies these effects in terms of observed earnings. It finds that program participants on average recorded earnings 14% higher than non-participants by age 40. Again, it must be emphasised that this figure refers to a specific study conducted on an outlying group of children from vastly different backgrounds to those typically experienced in Australia.

In perhaps a more appropriate setting for comparison, PwC (2004) review the literature and estimate that children attending universal ECEC in the UK are likely to experience increased earnings of around 3%. This is an indicative estimate based on approximations and one not backed by observed data, but it nonetheless provides a reference point against the Perry Preschool result.

In analysing the impacts of the Head Start program, Ludwig and Phillips (2007) cite research by Krueger (2003) that estimates that an effect size of 1 standard deviation in either reading or writing would increase lifetime earnings by around 8%. In comparison, the Perry Preschool Study is estimated to increase lifetime earnings of participants by around 14%, yet the effect sizes reported for this program are in the order of 0.33 – 0.77 for school performance and 0.5 – 0.9 for IQ scores.

However, basing estimates of benefits purely on effect sizes is likely to be misleading, largely because this approach assumes that the variable to which the effect size relates is the sole driver of impact on the participant. There is no consensus in the literature as to which variable is most important in determining the success of the program (e.g. whether programs should target improved literacy or mathematics outcomes) and effect sizes for different variables can differ markedly. Secondly, the effect sizes for the same variable show large variations between studies and are susceptible to statistical noise such as small test groups. Hence, it is judged that basing estimates of benefits on observed outcomes is a more robust approach than basing estimates on effect sizes, although given the nature of the research to date, it is likely that either approach will provide only an indicative estimate.

3.1.2.8 ILLUSTRATING THE POTENTIAL BENEFITS OF THE PROPOSED CHANGES

Given the absence of robust quantitative evidence on universal, incrementally higher quality ECEC generally, and of the structural parameters in particular, it is judged that it is not possible to provide an accurate measure of the benefits of the proposed NQA reforms. Instead, the preceding discussion provides information on the likely impacts of the regulations insofar as the experience in other programs may be transposed to the current context. Although a sizable portion of the literature is inconsistent or inconclusive in its findings, on balance there appears sufficient evidence that improvements in structural aspects of quality will result in benefits for children in ECEC. Higher teacher qualifications in particular appear to have positive implications for the learning outcomes of children, although no studies quantify this impact financially (i.e. in a fashion amendable to inclusion in a cost benefit analysis).

It is also worth highlighting that this discussion does not distinguish between different starting points for the improved ratios. That is, it says nothing about the relative benefits of an improvement in staff to child ratios from 5:1 to 4:1 versus a subsequent move from 4:1 to 3:1. Without such information it is impossible to arrive at what may be considered an 'optimal' level of quality.

The extent to which further increases in quality are justified from a cost-benefit sense depends on how benefits change with incremental changes in quality. Will improvements in quality lead to equi-proportional increases in benefits, or will benefits increase by a greater or lesser proportion? These concepts are demonstrated in the diagrams on the following page.

Figure 3.1 and Figure 3.2 graph quality against benefits, giving a theoretical representation of how benefits may change as higher quality standards are adopted. The first figure shows the case of constant and increasing returns. Constant returns imply that for each incremental increase in quality (however quality may be defined) the benefits increase by a constant amount (i.e the relationship is linear). Increasing returns imply that this amount increases as quality grows by a given amount.

The diagrams show a starting level of quality Q_0 which confers benefits of B_0. Suppose that the level of quality increases to level Q_1. On the Constant Returns curve, the benefits increase to the level CR_1 and on the Increasing Returns curve to IR_1. A further increase in quality of the same amount to Q_2 would lead to benefits increasing further to CR_2 and IR_2 respectively. The linear shape of the Constant Returns curve implies that the increase in benefits from B_0 to CR_1 is equal to the increase in benefits from CR_1 to CR_2. That is, as the name suggests, returns increase by a constant amount as quality increases. In the case of the Increasing Returns curve, the incremental benefits of improving quality increase as quality increases. That is, the distance IR_1 to IR_2 is greater than the distance B_0 to IR_1.

Figure 3.2 shows the case of decreasing returns. In this case the increases in benefits decline as additional resources are spent on improving quality. Diagrammatically, this is shown by benefits rising from B_0 to DR_1 as quality increases to Q_1. A further increase in quality leads to a smaller increase in benefits from DR_1 to DR_2.

FIGURE 3.1: ILLUSTRATION OF INCREASING RETURNS FROM QUALITY

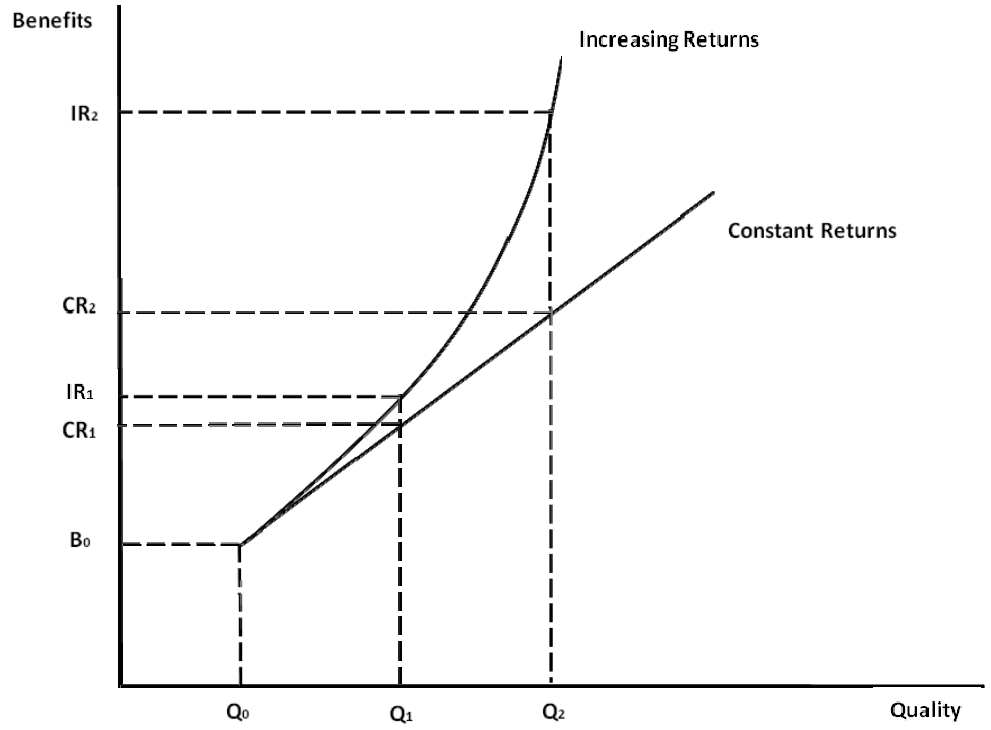
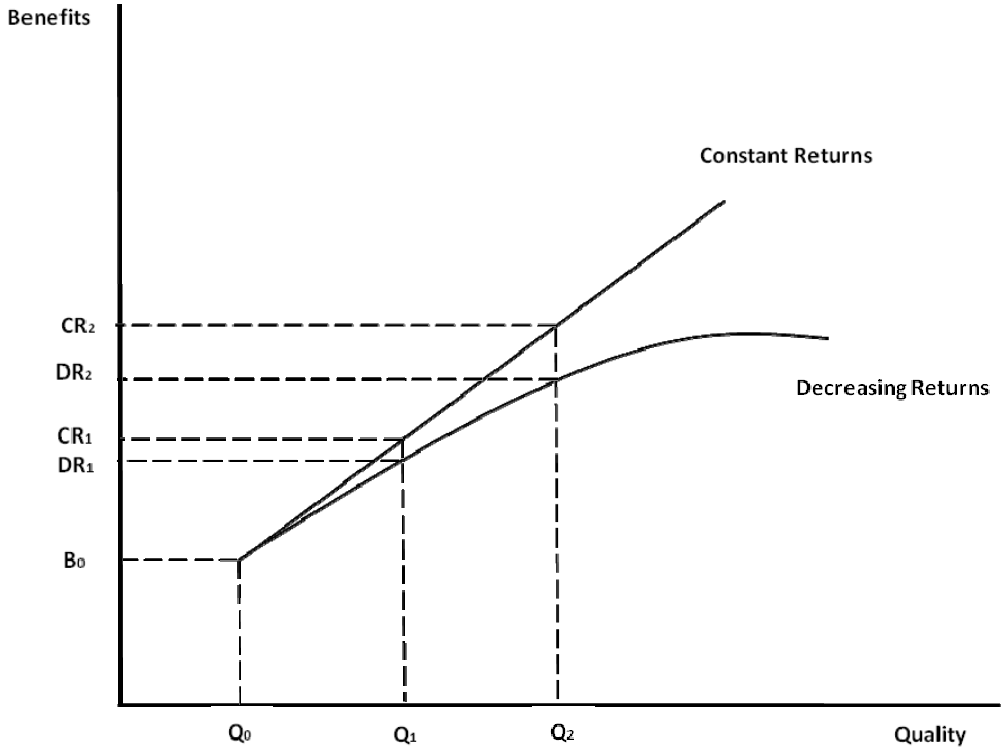


FIGURE 3.2: ILLUSTRATION OF DECREASING RETURNS FROM QUALITY



Determining the actual relationship between quality and benefits is therefore crucial to ranking different options and when deciding on the 'optimal' quality standards. If the relationship is one of increasing returns, then it may be optimal to increase quality to relatively high levels, as the additional benefits of doing so increase as quality improves. If decreasing returns are present, then additional spending on quality may be less justified as the gains of doing so fall as additional resources are put into quality (i.e the investment in quality is subject to diminishing returns).

In reality it is difficult to determine what the true shape of this curve may look like. Research to date provides only limited insight into which of the cases above is likely to exist. Further, it may be that the relationship between quality and benefits exhibits all of these cases at different points of the curve. For example, research indicates that low levels of quality may actually be detrimental to participants, implying that increasing returns are likely to characterise low levels of quality. At what point these returns cease to exist, if at all, and how sharply they decrease if and when decreasing returns commence, is unknown. A further complication is the possibility of threshold effects, whereby certain levels of quality may be required to confer any benefits to participants, or where additional benefits may cease after a certain point.

While there is detailed knowledge of the costs involved in improving quality standards, the lack of comprehensive research on the benefits of different levels of quality is hampering the debate on quality ECEC in Australia. There appears to be a need to establish a comprehensive longitudinal study of Australian ECEC participants in order for this debate to progress constructively. This study should seek to understand what elements of programs lead to positive outcomes, how the structural quality parameters influence quality, and how outcomes vary based on these parameters. Such a study, emulating those conducted overseas, would prove to be an invaluable resource in offering ECEC services which best meet the needs of Australian children, their families and the community in general.

3.2 BENEFITS OF A STREAMLINED REGULATORY FRAMEWORK

The third core element of the NQA is an enhanced regulatory framework for the ECEC industry. In recognition of the current duplication between state and Commonwealth regulations, as well as the inconsistent and non-uniform application of regulation, the NQA aims to implement a more streamlined, more efficient framework of industry regulation. As the following sub-sections outline, the benefits of regulatory reform will accrue to both regulators, and the regulated.

3.2.1 CURRENT REGULATORY OVERLAP

As an indication of the current level of duplication between the activities of different regulators of ECEC, Table 3.4 and Table 3.5 show areas identified by DEEWR where the quality principles regulated by the NCAC overlap with the state regulations for FDC and LDC, respectively.

Naturally, such comparisons cannot take account of the fact that different authorities may check the same principles in a technical sense, but in a practical sense they may be assessing things differently (i.e. a certain amount of 'technical overlap' may in fact be necessary). For example, state and territory legislation requires and monitors that policies are in place in a service to assist with administration and management. The accreditation system, however, requires the NCAC to look at the content of those policies to determine whether they represent a quality service. Both systems currently look at the same policies, but from different perspectives.

Though this provides only a relatively crude estimate of the current duplication, it serves to illustrate firstly, that there is significant overlap in the regulation of quality aspects of child care across Australia; and secondly, that this varies markedly between jurisdictions. For FDC, states duplicate between 18 and 30 of the NCAC's quality principles, while for LDC, between 11 and 31 principles overlap.

TABLE 3.4: OVERLAP BETWEEN NCAC QUALITY PRINCIPLES AND STATE REGULATIONS, FDC

	No. of principles	VIC	NSW	QLD	WA	TAS	SA	ACT	NT
1. Interactions	5	-	4	2	1	3	2	5	-
2. Physical Environment	3	-	3	2	3	3	3	2	-
3. Children's Experiences, Learning and Development	7	-	6	5	6	3	6	7	-
4. Health, Hygiene, Nutrition, Safety and Wellbeing	6	-	5	4	5	4	4	5	-
5. Carers and Coordination Unit Staff	4	-	1	2	0	4	3	4	-
6. Management and Administration	5	-	3	4	3	5	5	5	-
Total	**30**	**-**	**22**	**19**	**18**	**22**	**23**	**28**	**-**

Source: NCAC December 2008, DEEWR analysis
Victoria has now moved to regulate FDC since this table was developed

TABLE 3.5: OVERLAP BETWEEN NCAC QUALITY PRINCIPLES AND STATE REGULATIONS, LDC

	No. of principles	VIC	NSW	QLD	WA	TAS	SA	ACT	NT
1. Staff Relationships with Children and Peers	6	0	5	3	2	3	4	6	5
2. Partnerships with Families	3	2	3	2	0	2	2	2	2
3. Programming and Evaluation	3	1	3	2	2	2	1	3	2
4. Children's Experiences and Learning	6	0	6	6	6	4	6	6	6
5. Protective Care and Safety	5	2	5	4	4	4	4	5	3
6. Health, Nutrition and Wellbeing	6	4	4	4	4	4	4	5	4
7. Managing to Support Quality	4	2	2	2	3	2	1	4	2
Total	**33**	**11**	**28**	**23**	**21**	**21**	**22**	**31**	**24**

Source: NCAC December 2008, DEEWR analysis

3.2.2 REDUCED NET COST OF REGULATION

The two tables presented above demonstrate, among other things, that there are a large number of areas in the current regulation of ECEC quality where the same criteria are applied by multiple regulators. Given the costs associated with collecting, processing and validating such information, this suggests that scope exists for a more efficient, more integrated model of industry regulation – ideally, where all duplicative activities are eliminated, and information is shared as appropriate. To the extent that the NQA reduces or removes this overlap – and does not otherwise increase the cost of regulation – a net reduction in the costs of industry regulation will be achieved. Whether this accrues to state and territory regulators or to the Commonwealth will depend on the specifics of the new framework. Several variants are modelled in Section 6.

3.2.3 REDUCED REGULATORY BURDEN

The other key consideration with respect to the regulatory framework is the costs imposed on those subject to the regulation (the so-called 'regulatory burden').

The amount of regulation in Australia has roughly doubled every decade since the 1950s. This imposes significant costs on businesses who are forced to meet the compliance needs, with estimates from some sectors indicating that around one quarter of company board time is spent on compliance issues. These costs are especially pertinent where the regulation is deemed to be 'excessive' or the information requirements duplicate existing reporting burdens. Duplication also increases costs at the regulator level, where more efficient sharing of information between regulators could streamline the process of collecting and analysing information.

The recent report, *Rethinking Regulation*, released by the Taskforce on Reducing Regulatory Burdens on Business identifies removing duplication as a major focus for reducing regulatory burden going forward. It identifies the need for improved dialogue between existing regulators to reduce the burden of reporting, collecting and analysing data:

> *'The key to reducing the record-keeping and reporting burden lies both within and across agencies and will depend on collaboration to rationalise the reporting and data requirements.'*[23]

In doing so it argues that there is:

> *'…considerable potential for government agencies to rationalise the data businesses have to report.'*[24]

In the case of ECEC regulation there appears to be substantial scope for the removal of duplication. This duplication is manifest in several areas, including:

- conducting site visits of service providers by both the NCAC at the national level for accreditation, and by various state regulators at the state level for licensing; and
- service providers are in some cases required to report the same information to both state and national regulators.

Undoubtedly this duplication imposed costs on ECEC services, with additional, unnecessary time dedicated to regulatory adherence – in completing reporting requirements and in facilitating on-site visits by regulators.

Further, for providers operating across multiple jurisdictions, the absence of national consistency imposes additional costs in having to ensure compliance with multiple, differing sets of regulation. Harmonisation of regulation – such as the uniform quality standards proposed under the NQA – reduces the regulatory burden on providers operating in multiple jurisdictions and makes it easier and less costly for providers currently operating in a single state or territory to expand into other jurisdictions.

[23] Australian Government (2006) page 141.
[24] Ibid.

3.3 BENEFITS OF A QUALITY RATING SYSTEM

Markets function best when consumers are fully informed about the product they are purchasing. This information allows them to 'vote with their feet' by purchasing those goods or services which provide the best combinations of the features they desire, at the most competitive price. Service providers then face incentives to offer high quality, cost-competitive services as with full information consumers' responsiveness to these characteristics is heightened. This link between information, quality and prices underpins the workings of free markets.

When consumers are not well informed about certain aspects of quality, this nexus is broken. Service providers no longer face strong incentives to provide high quality services, as this quality cannot be easily observed by consumers and will therefore not affect demand for the service provided. Information issues of this nature represent a market failure and provide a rationale for government intervention to heighten market price and quality signals. These issues arise in a variety of markets, including, for example, the disclosure of information in financial markets, and more recently, disclosure of energy efficiency as part of climate change policy.

Given that parents face difficulties in assessing the quality of ECEC service providers in the current environment, there appears to be a role for a quality rating system to disseminate this information. Insufficient information may be received by parents for a number of reasons:

- information on quality, and in particular aspects of structural quality, may not be readily observable by parents; and
- even if this information is available, parents may lack the technical understanding of quality issues to assess whether the ECEC service provider is of high or low quality.

By providing this information to parents in a form which easily allows them to compare the price of a service with the quality of care their child will receive, the parent decision-making process – where there is in fact choice of service provider – will be improved. From an economic perspective two general benefits are derived from this outcome:

- the choice of ECEC service provider will be more closely aligned to individuals' trade-off between quality and price; and
- service providers will face an increased incentive to improve the quality of ECEC offered as this can now be better observed and assessed by parents. Providers offering relatively lower quality services are therefore likely to be penalised with less demand (providing adequate proximate alternatives exist), while high quality services will attract additional business and be rewarded by the market.

This second point is important. While a quality rating system will not lead to improved quality directly, by increasing parents' awareness of and responsiveness to quality, it will increase the incentives for services to provided higher quality ECEC, therefore augmenting quality improvement over time.

3.4 CONCLUSIONS

This section has identified benefits associated with each aspect of the proposed NQA. The findings can be summarised as follows:

- Despite the inconsistency of the literature in quantifying the benefits of higher structural quality, the reforms proposed as part of the NQA will unequivocally confer benefits on children in ECEC. The improvements in structural quality proposed are likely to result in higher lifetime income, with the balance of the literature supporting this conclusion. There are also likely to be other financial benefits associated with higher quality care, including improved health and education system outcomes, however these are likely to be less significant.
- A quality rating system will sharpen the role of market signals by increasing the sensitivity of consumers to the quality of care. This in turn will lead to more informed decision making by parents and generate greater incentives for service providers to increase quality.
- Consolidating the regulatory framework will reduce the burden of licensing and accreditation – both on the regulators and service providers.

Of these benefits, only the final one can be quantified with some certainty. The impacts of a quality rating system are more difficult to ascertain. They predominantly relate to improving market signals, allowing the market to function more efficiently over time. The impacts on decision-making and resulting improvements in quality levels cannot be accurately isolated, and so it is not possible to arrive at accurate estimates of the financial impacts.

Improvements in the structural quality of ECEC are likely to produce the largest benefits, however there is at present insufficient evidence to reliably quantify these impacts. The largest financial impacts of the improvement in structural quality parameters are likely to flow from increases in lifetime earnings, although there are likely to be additional gains to the broader community in terms of health and education system savings also.

4. POLICY SCENARIOS

The proposed National Quality Standard focuses on LDC and preschool, and FDC. The National Quality Standard, the characteristics of the rating system, and the regulatory model that supports these remain under development subject to COAG endorsement of the RIS, and will be informed by public consultation on the ECEC quality reform RIS in July and August 2009. To inform the policy development process and to allow comparison of the impact of alternative policy settings, several policy scenarios have been modelled. The scenarios have been formulated to canvass a spectrum of reform possibilities; from minimal change to major structural reform.

The following sections provide an overview of the scenarios. A more detailed description is provided in the COAG Consultation RIS available at **www.coag.gov.au**.

Further work will be undertaken by governments to consider how other ECEC service types, such as IHC, occasional care and non-mainstream services, will be incorporated.

4.1 NATIONAL QUALITY STANDARD

The proposed **National Quality Standard** focuses on LDC, FDC and preschool. The standards have been developed jointly by the Commonwealth and the states and territories though COAG, with input from a range of sources including the representatives of Commonwealth, state and territory government departments, public consultation, the Expert Advisory Panel, current regulators and Australian and international research. Table 4.1 presents the proposed standards under the NQA which have been modelled.

TABLE 4.1: NATIONAL QUALITY STANDARD SCENARIOS[25]

Scenario	Staff to child ratio	Qualifications
LDC and preschool Scenario 1 (Baseline)	❑ No COAG policy change.	❑ No COAG policy change.
LDC and preschool Scenario 2	❑ For children from birth to 24 months the staff to child ratio to be 1:4 by the end of 2015. ❑ For children aged 25 to 35 months the staff to child ratio to be 1:5 by the end of 2015. ❑ For children aged 36 months to school age the staff to child ratio to be 1:11 by the end of 2016.	❑ All staff working with children would be required to have a minimum Certificate III level qualification (or be enrolled in study) by the end of 2013. ❑ Fifty per cent of staff working with children are to have a qualification (or be enrolled in study) of Diploma or above by the end of 2013. ❑ Services that have 25-59 children on any day, are required to employ 1 full-time university qualified early childhood teacher by 2013. ❑ Services that have 60-80 children on any day are required to employ 0.5 of an additional university qualified professional by 2015, and a full additional university qualified professional for services with over 80 children on any day. ❑ Services with less than 25 children would be expected to have access to a proportion of an early childhood qualified teacher for pedagogical leadership by 2013. ❑ Where the service provision only includes children birth to 3 years or where there is already a qualified teacher on site an appropriate alternative qualification may fulfil this requirement (with the need for and exact requirements for additional professionals to be determined).
LDC and preschool Scenario 3	❑ For children from birth to 24 months the staff to child ratio to be 1:4 by the end of 2011. ❑ For children aged 25 to 35 months the staff to child ratio to be 1:5 by the end of 2014. ❑ For children aged 36 months to school age the staff to child ratio to be 1:11 by the end of 2015.	
LDC and preschool Scenario 4	❑ For children from birth to 24 months the staff to child ratio to be 1:4 by the end of 2010 and 1:3 by the end of 2020. ❑ For children aged 25 to 35 months the staff to child ratio to be 1:5 by the end of 2015. ❑ For children aged 36 months to school age the staff to child ratio to be 1:10 by the end of 2013.	
FDC Scenario 1 (Baseline)	❑ No COAG policy change	❑ No COAG policy change
FDC Scenario 2	❑ Mixed age groups of children to have a staff to child ratio of 1:7 by 2011 with a maximum of four children under school age.	❑ All carers would be required to have a minimum Certificate III level qualification (or be enrolled in study) and all coordinators would be required to have a Diploma qualification no later than the end of 2013.

4.2 ENHANCED REGULATORY ARRANGEMENTS

The development of enhanced regulatory arrangements is an integral component of the NQA and is intended to ensure that implementation of the National Quality Standard and Ratings Framework creates a more efficient and less burdensome regulatory environment for ECEC providers.

Two regulatory options for assuring the quality of ECEC services are outlined below.

[25] The baseline for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC.

Scenario 1: No COAG policy change in regulation

Scenario 2: An integrated national system for administering the National Quality Standard and Ratings Framework, and a new national body assuring national consistency

This option is a genuinely integrated national system with the following features:

- a single national system to replace current licensing and quality assurance processes and apply to all LDC, preschool, FDC and OSHC services regardless of location;
- the National Standard to apply to all LDC, preschool, FDC and OSHC services regardless of setting or location;
- joint governance of the national quality system, to allow the perspective of all jurisdictions to be taken into account in the setting of and changes to the standard and assessment process;
- no duplication of regulation across levels of government, or sectors;
- individual services dealing with only one organisation for regulation and assessment;
- parents and service providers receiving information from only one source; and
- a national body with joint governance arrangements to oversight the administration of the National Quality Standard and Ratings Framework, and assure national consistency against the framework.

4.3 QUALITY RATING SYSTEM

Scenario 1: No COAG policy change

Scenario 2: Implement a new rating system based on the new National Quality Standard

This option would see the introduction of a quality rating system which integrates the new national standard. The public consultation process undertaken in August and September 2008 provided general support for a descriptive approach to a rating system.

The quality rating system has been developed to take account of the needs of parents and what information they want to know about their service. The proposed rating system integrates the proposed new national quality standard and presents information on service levels.

In assessing services against the new National Quality Standard, it is proposed that services will receive an overall rating and ratings for each of the seven quality areas which would give them a quality profile.

The five possible ratings a service could achieve would be:

- **Unsatisfactory**: Services will receive an unsatisfactory rating when they do not meet the National Quality Standard, or, prior to legislation for a national minimum standard coming into effect in each jurisdiction, do not meet relevant State or Territory licensing requirements.
- **Operating Requirements**: This rating will apply to new services to allow them to operate prior to formal assessment against the National Quality Standard, and to services that are not currently meeting the National Quality Standard but have a plan

which works toward meeting the required standard. Prior to legislation for a national minimum standard coming into effect in each jurisdiction it will also apply to services that meet the relevant State or Territory licensing requirements in order to operate, but do not meet some aspects of the National Quality Standard where these are greater than State or Territory licensing requirements.

- **National Quality Standard**: This rating requires services to meet the National Quality Standard in the areas of educational program and practice; children's wellbeing, health and safety; physical environment; staffing arrangements; relationships - interactions within the service; collaborative partnerships with families and communities; and, leadership and service management.
- **High Quality**: This rating requires a service to meet the National Quality Standard levels plus additional elements. These may include exceeding the National Quality Standard in identified areas to achieve higher quality outcomes. High Quality services would be expected to provide access to preschool, in line with the Universal Access commitments.
- **Excellent**: A service will achieve an overall rating of Excellent by nomination and assessment as a centre of excellence. Services in this category would be services that demonstrate excellence in the provision of ECEC by actively fostering innovation, for example excellence in ECEC integration, social inclusion, and community engagement.

It is proposed that each level will be defined by a set of criteria, including quantitative and qualitative assessment by an external assessor on key areas. The aim is for it to be a cost effective model with no duplication, and reduced administrative burden for service providers. The matrix integrates the new standard and presents information on service levels to better meet the information needs of families. It is proposed that services will receive an overall rating and ratings for each of the seven quality areas which would give them a quality profile.

5. MODELLING AND ANALYSIS

5.1 FRAMEWORK FOR THE ANALYSIS

The economic impacts of the proposed reforms are analysed in a standard cost-benefit analysis framework. Potential costs and benefits are identified and analysed, and included in the cost-benefit modelling where the available data and evidence enables reliable quantification. As noted throughout, the absence of sufficient information to rigorously quantify the benefits accruing from the National Quality Standard, and to attribute benefits to a single characteristic of quality, means that a large proportion of the benefits cannot be quantitatively included in the CBA.

The economic impacts of the alternative scenarios under consideration are estimated by comparison with the 'baseline' or 'business as usual' scenario (represented in each case by Scenario 1). Only those costs and benefits directly attributable to the proposed reforms are included in the scenario analysis. This means that concurrent reforms such as Universal Access are not directly reflected in the costs and benefits estimated here (refer to the discussion in Section 2.4, above).

Discounted cash-flow analysis is employed to combine and compare impacts occurring over different time periods (something particularly relevant to ECEC where many of the benefits occur well into the future).

The core components of the cost-benefit analysis reflect the three key elements of the proposed reforms, namely:

1. **A National Quality Standard:** incremental benefits (i.e. over and above the baseline) of children receiving higher quality ECEC (including impacts on parents' workforce participation) and costs associated with provision of higher quality care, such as greater staff numbers, higher staff wages and the cost of increasing the qualified ECEC workforce to meet higher demand.
2. **Enhanced regulatory arrangements:** efficiencies accruing from a more streamlined, more effective regulatory model (both to regulators and the regulated) and net operating costs of any new regulatory body (i.e. relative to the status quo).
3. **Quality rating system:** costs of administering the system and benefits arising from more informed decision making by parents.

To accurately capture the distribution of the reforms' costs and benefits among different segments of the industry, as well as between different industry stakeholders, the overall ECEC industry is disaggregated based on:

- jurisdiction;
- ownership (government, community and private);
- service type (LDC, preschool, FDC); and
- region (metropolitan, regional and remote).

Consistent with the policy emphasis, the modelling undertaken and the results reported focus on LDC, preschool and FDC.

5.2 DATA SOURCES AND SPECIFICATION

Data to populate the cost-benefit model and to estimate key parameters underpinning the analysis have been gathered from a wide array of sources. This sub-section of the report briefly sets out the main sources of data and the specification of these data in the model. Additional data tables are provided at Appendix B.

A key component of the data collection and validation exercise was bilateral meetings with state and territory government agencies. State governments in all jurisdictions were individually consulted, resulting in the collection of a range of data which is not otherwise available. Bilateral meetings also enabled the development of a thorough understanding of operational differences across jurisdictions, and later facilitated the testing of a range of key modelling parameters.

5.2.1 NATIONAL QUALITY STANDARD

Modelling the impacts of the proposed new **National Quality Standard** is the most data-intensive aspect of the NQA CBA model. Data has been collected and collated from a wide number of sources including publicly available data, administrative data maintained by DEEWR (including Child Care Services and Child Care Benefit data), data collected by the NCAC and state and territory government data. The findings of other projects commissioned by DEEWR and the ECDS have also been utilised, including:

- an online survey of parent choice (in relation to price and quality);
- modelling of the costs of providing LDC and FDC;
- economic modelling of parents' workforce participation decisions; and
- behavioural modelling analysing the supply of and demand for ECEC in an integrative model framework.

Services and enrolments

Data sourced through state and territory consultations, DEEWR and NCAC were used to derive a count of each service, number of licensed places (in full time-equivalent (FTE) terms), number of FTE places used and number of FTE carers per service. Enrolments were disaggregated into four age groups: 0-12 months, 12-24 months, 25-35 months and 36+ months. The total number of children in each service by age group was aggregated using the age distribution from the 2006 Australian Government Census of Child Care Services (DEEWR, 2008).

Quality and costs

Data on current levels of ECEC quality including where possible the staff to child ratio, and qualified staff to child ratio in each service were sourced from NCAC data, unpublished data maintained by DEEWR and from data and information collected from state and territory governments. Individual carers are aggregated to services based on service-level data provided by state governments and sourced through the NCAC. Where data are not available, minimum requirements for carers by qualification level are assumed (i.e. a licensed centre is assumed to meet the minimum standards in the jurisdiction in which it operates), with the qualification distribution of the National Children's Services Workforce Study used to validate estimates. ECEC staff are categorised into four classifications: University qualified, Diploma level qualifications, Certificate III level qualifications and Unqualified.

A key focus of the regulations is the relationship between staff and children. As such, the characterisation of services' operating costs in the modelling focuses purely on labour costs. Baseline costs are estimated by aggregating available labour by qualification level based on current operating ratios, or in absence of data, on minimum standards. The latest award wages for each qualification in each jurisdiction are applied together with staff on-costs to calculate total labour costs. Parameters employed in these estimates are described below.

5.2.2 REGULATORY OPTIONS

The details of the new regulatory arrangements are yet to be finalised, so it is not possible to undertake an analysis of this aspect of the reforms at this stage. However, the new system will be a genuinely national system with reforms based upon the key features identified in section 4.2.

The expectation is that such a model will result in cost savings for service providers flowing from the reduced administrative burden as the result of a fully integrated approach to licensing, regulation and quality assurance. It is anticipated that savings generated within services would be re-invested into improved services for children and their families using that service.

5.3 MODELLING PARAMETERS AND ASSUMPTIONS

In addition to the core data described above, a range of other parameters and modelling assumptions are adopted in the CBA. This section outlines these parameters and assumptions and provides the basis of their estimation.

5.3.1 BASELINE ASSUMPTIONS

Current quality levels

Determining the number of services in each jurisdiction which currently operate at or above the proposed new National Quality Standard is an important aspect of the modelling. Simply assuming that services operate at the legislated minimums will result in over-estimation of the impacts of the reforms. As recent analyses in New South Wales and Victoria have demonstrated, a significant proportion of the industry operates above (i.e. at a higher staff to child ratio) minimum standards. Based on discussions with state governments, the assumptions outlined in Table 5.1 have been adopted for the number of services that are currently operating at the levels specified in National Quality Standard Scenarios 2 and 3 (that is, at a staff to child ratio of one to four in the 0-24 month age group and one to five in the 25-35 month age group). For National Quality Standard Scenario 4 it is assumed that operating levels are consistent with Scenario 2 and that no services are operating at 1:3 for ages 0-24 months.

TABLE 5.1: ASSUMED CURRENT ECEC QUALITY LEVELS, LDC

Age Group (months)	ACT	NT	NSW	VIC	SA	WA	QLD	TAS
0-12	28%	34%	100%	100%	32%	100%	100%	28%
12-24	28%	34%	100%	100%	32%	100%	100%	28%
25-35	100%	100%	23%	100%	16%	100%	20%	100%
36+	100%	100%	100%	9%	100%	100%	29%	100%

Note: 100% indicates that the service is currently regulated at the proposed standard. No operational adjustments were made for these services.

Baseline quality trends

Over time, in absence of the NQA reforms, it is likely that some improvement in staff to child ratios and staff qualifications would still have occurred - partly due to the market-augmented improvement in quality levels and partly due to likely state-initiated reforms. In order to ensure the baseline accurately reflects the evolution of the sector over time, and hence that the modelled scenarios are compared to an appropriate counterfactual, a set of baseline assumptions has been developed in consultation with DEEWR and with industry stakeholders.

The baseline includes staff to child ratios that are currently under consideration for NSW (1:4 for children aged 0-24 months by end-2011) and have recently been introduced in Victoria (1:4 for children aged 0-36 months or all new licences and in previously licensed services by end 2011, and 1:12 qualified staff ratio for children 0-36 months by end-2011). The costs of these policy changes are therefore captured here in the baseline and are not attributable to the NQA reforms. Other baseline assumptions for the LDC sector include:

- All states moving to a 1:4 ratio for ages 0-24 months by end-2015.
- Victoria moving to a 1:12 ratio for ages 36+ months by end-2015.
- NSW moving to a 1:6 ratio for ages 25-35 months by end-2015.
- South Australia moving to a 1:8 ratio for ages 25-35 months by end-2015.
- From 2015, phasing in of a qualified teacher in every centre-based service of 20 or more and minimum Certificate III for all staff.

No changes are assumed in the baseline for preschool or FDC.

5.3.2 PARENTS' DEMAND RESPONSE

As noted above, the National Quality Standard associated with the NQA will impact parents' decisions regarding whether to place their child in ECEC through two main channels: the quality of ECEC will rise, and the cost will increase. 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. One possible explanation for the results is that, in the observed data, the effects of price and quality offset each other. Nevertheless, these results are consistent with other research in the literature which finds only 'modest' effects (i.e. relatively small elasticities).

The low sensitivity of parents to increases in the cost of ECEC (at least when considered in the context of improved quality) has several key implications for the CBA modelling:

- First, it implies that enrolments are unlikely to be materially affected by the reforms, neither increasing in response to higher quality, nor decreasing in response to higher price.
- Second, it implies that the reforms are unlikely to have a significant impact on parents' workforce participation decisions, and therefore on labour force participation in the economy.
- Third, coupled with the high level of Government subsidy, it suggests that providers' capacity to pass on the additional costs associated with meeting the new standards under the NQA is high.

5.3.3 PROVIDERS' SUPPLY RESPONSE

The reforms canvassed as part of the NQA will impact directly on the ECEC providers. Higher staff to child ratios and more highly qualified staff will mean higher labour costs for a given number of enrolments. Whether services respond by increasing staffing levels, cutting places or, in the extreme, by closing altogether, will determine the impact of the reforms on ECEC places (though under any assumption, the new National Quality Standard will be achieved).

Services' decision in this regard will be impacted by a range of factors, however one of the primary determinants will be their ability to pass the additional costs onto consumers (parents). The capacity to pass on costs in turn hinges on the characteristics of the market for ECEC, and in particular the price elasticity of demand. In the case of child care, the price elasticity of demand appears relatively low.

The Australian estimates, for example, of Doirin and Kalb (2005), Kalb and Lee (2007) and Rammohan and Whelan (2005 and 2006), suggest a range of between -0.02 and -0.21. Reinforcing this is recent research undertaken by Access Economics in the context of the NQA (2009b) which suggests that cost, quality and availability of child care have no statistically significant impact on parents' labour supply decisions[26]. One possible explanation for the results is that, in the observed data, the effects of price and quality offset each other.

The relatively low responsiveness of parents' demand for ECEC to price, together with the high level of Government subsidisation, suggests that services' ability to pass on increased labour costs without a significant impact on enrolments is high. Consequently, the NQA reforms are assumed to not deviate growth in ECEC places from its projected path. The viability of services is not jeopardised, and services are assumed to increase staffing levels as required to meet the new standards.

This assumption is consistent with survey-based research undertaken by Booz and Co for the NSW Department of Community Services. This work found that 95.3% of services impacted by the proposed move to a staff to child ratio of 1:4 for children under 24 months would increase staff costs rather than decrease places (DOCS, 2008).

5.3.4 GOVERNMENT OUTLAYS

Reflecting the large contributions that governments at both the Commonwealth and state levels make to ECEC in Australia, the NQA reforms will impact directly on Government outlays.

Commonwealth

The impact of the reforms on Australian Government outlays will be estimated based on CCB and CCTR modelling undertaken by DEEWR. As a reasonable working assumption, it is assumed that around 47% of the increase in child care costs in eligible services is borne by the Australian Government.

[26] Around two-thirds of parents cite work-related factors as the main reason for using formal care, hence this provides a strong indication of the elasticity of demand for ECEC.

States and territories

The contribution made by individual state governments to the costs of child care varies across jurisdictions, however only where funding is directly linked to the cost or price of ECEC in an *ad valorem* fashion will state government outlays be impacted.

Based on data and information provided through state consultations, LDC and FDC services are not funded on a basis that is linked to the cost of care. Rather, total funding is determined based on outlays which are either fixed, or a function of factors other than the cost/price of places. The exception to this is Western Australia which directly funds 37 LDC services.

Government preschools are expected to be the major contributor to any increase in state Government outlays on ECEC due to the NQA. As each state provides or funds preschools, cost increases for these services are expected to flow through to state budgets. Any increase to funding of private and community preschools is dependent on funding arrangements being linked to the costs of care.

States that currently fully fund preschool education include Western Australia, Tasmania, ACT, South Australia, the Northern Territory and New South Wales for its 100 Government preschools. These states place levies on parents, however, these are generally only minimal payments. Northern Territory and Western Australia have voluntary contributions from parents, with a contribution of $60 per year in Tasmania and $65 to $75 per term in South Australia. Parents pay higher fees in other states, with average fees of $28.30 per day in New South Wales and $746 per annum in Victoria (excluding independent schools). In Queensland the government funds around 80% of teacher's wages in kindergartens which are registered with C&K.

5.3.5 IMPLEMENTATION AND TRANSITION

The new National Quality Standard is assumed to be adopted in a linear fashion under each scenario, at a rate determined by the implementation date (i.e. adoption occurs more rapidly under scenarios with earlier deadlines). A constant number of new services – consistent with that required to reach full accreditation by the desired target year – is assumed to achieve the new ratios each year. Where the rate of accreditation out-paces the growth in qualified labour (assumed to be 5.5% per annum), thereby accentuating existing labour supply shortages, services are assumed to employ the next most qualified worker, until sufficient labour of the required qualification is available. For example, if a university trained teacher is required but not available, a Diploma level carer is appointed to the service to meet the ratio requirement until a university trained teacher becomes available. This has the effect of reducing the costs relative to what would prevail given unconstrained availability of qualified labour, as lower qualified workers in most instances attract lower wages.

If full accreditation is characterised by universal achievement of qualified labour requirements (rather than merely satisfying staff to child ratios with labour of any qualification level), then the growth in qualified labour is central to the pace of accreditation.

As noted in Section 2.4.2, the qualified labour force growth rate of 5.5% was developed through consultations with DEEWR to determine an achievable rate for future labour growth in ECEC, given the workforce initiatives proposed. Growth of this magnitude would represent an acceleration of recent trends which have seen qualified ECEC labour grow by between one and two per cent. The estimated rate of compliance achieved under these assumptions is outlined in Section 6.4.

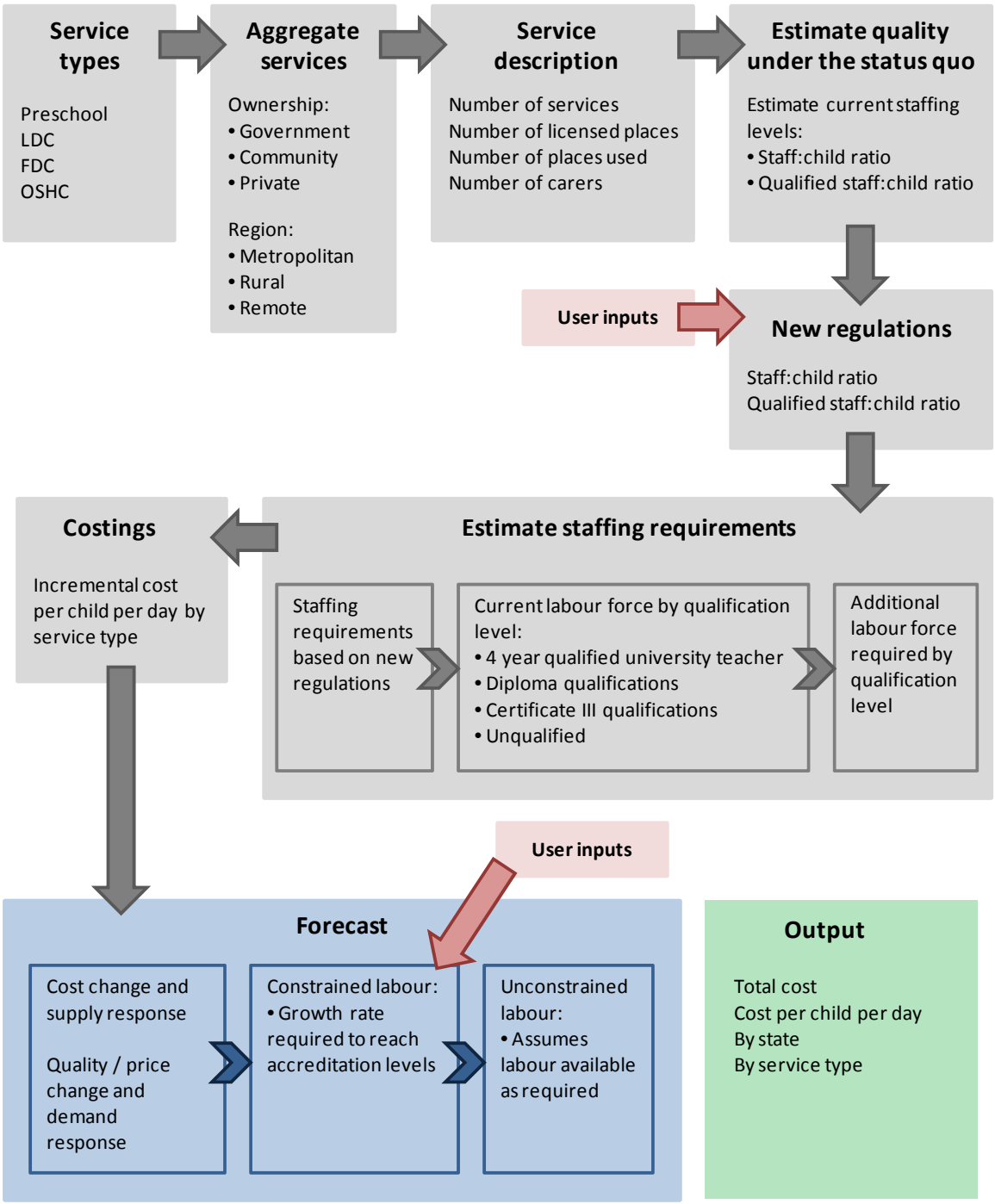
5.3.6 OTHER PARAMETERS AND ASSUMPTIONS

In addition to the assumptions relating to the nature and operation of the ECEC sector described above, a range of general assumptions are also employed in the modelling:

- **Real discount rate**: consistent with the guidelines in the Best Practice Regulation Handbook (Australian Government, 2007), a real discount rate of 7% is employed, with 3% and 10% tested in sensitivity analysis.
- **Real wage growth:** real wages growth in the ECEC sector is assumed 2.0% per annum. This is based on historical growth in wage rates within the sector, future wage increases agreed through various industry awards and an expectation of growing wage pressures as a result of increased demand for labour.
- **Qualified labour growth rate:** the stock of qualified labour (University Qualified, Diploma and Certificate III) is assumed to grow at a rate of 5.5% per annum. This figure is based on discussions with the DEEWR and represents what is deemed an achievable growth in qualified labour within the ECEC sector, given workforce policy proposals.
- **Labour mobility:** labour is assumed to be transferable across service types within each state, and hence surplus labour from one segment of the industry can transfer to meet excess demand elsewhere.
- **Training costs:** data to estimate the cost of training additional staff to meet the proposed staff to child ratios and qualifications was supplied through DEEWR and sourced from Office of Post-Compulsory Education and Training, Cengage Education and through DEEWR publications. The following parameters are assumed in the modelling:
  - Certificate III - $3,500
  - Diploma Level - $8,500
  - University Teacher - $12,551 per annum ($50,204 over 4 years)
- **Enrolment growth**: enrolment growth has been modelled based on the year-by-year growth profile for each jurisdiction estimated in the Behavioural Modelling (Access Economics, 2009), and outlined in 2.2.4, above.
- **Staff on-costs**: on-costs are modelled on a state-by-state basis based on previous DEEWR research and state and territory awards. The resulting weighted average is 18.0%.
- **Operating days:** cost per child per day based on 200 operating days for preschools and 250 operating days for other care services.

5.3.7 STRUCTURE OF THE MODEL

Presented below is a schematic of Access Economics' custom-built ECEC CBA model. The model establishes a detailed breakdown of the industry as it currently stands, then estimates the impacts of user-selected reforms through a series of inter-related modules.



6. MODEL RESULTS

6.1 COSTS OF THE NEW NATIONAL QUALITY STANDARD

The most significant cost associated with the NQA is the new National Quality Standard. With labour costs representing up to 70% of services' total operating costs, mandating additional and more highly qualified staff, will add significantly to the cost of providing ECEC in Australia. This section presents the estimated costs attributable to the proposed **new National Quality Standard**. The focus of the discussion is on FDC, LDC and preschool, with results presented for the scenarios set out in Table 4.1 above.

Two key sets of results are presented:

- Total costs and the net present cost (NPC) of total costs over the ten years to 2020, which includes the cost of employing additional staff to meet the new ratios, the cost of employing more highly qualified staff to meet the new qualification requirements and the training costs associated with increasing the LDC workforce to the required level.
- Cost per child per day, which shows the impact, on average, on the daily cost of an ECEC place, taking into account only those factors which impact on services' costs. Principally, this means that training costs are excluded, as these are assumed to be borne by the individual and/or the Government, rather than the service.

6.1.1 SUMMARY OF RESULTS

6.1.1.1 LONG DAY CARE

The costs associated with the new standards in LDC are estimated at between $1,181.2 million for Scenario 2 and $2,157.4 million for Scenario 4, over the ten years to 2020 (Table 6.1). The main drivers of the cost differences between Scenarios 2 to 4 are the staff to child ratio applicable to each age group and the timing of proposed changes, as detailed in Table 4.1.

TABLE 6.1: LDC COST SUMMARY[27]

Scenario	NPC	Year ($real million)									
	to 2020 ($m)	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	1,108.3	46.4	107.5	126.5	146.2	162.3	181.4	192.9	206.1	221.8	240.0
Scenario 2	1,181.2	33.2	86.2	123.6	163.5	188.2	203.9	220.1	232.7	247.9	261.0
Scenario 3	1,247.0	42.4	102.6	141.2	179.8	203.7	207.9	220.1	232.7	247.9	261.0
Scenario 4	2,157.4	99.3	150.1	215.3	284.4	322.9	359.2	390.5	426.3	464.1	502.9

Reflecting the pattern of implementation under each scenario, costs increase sharply over the first six years, then more slowly thereafter. This is due to the new standards being predominantly phased-in over a period of five years. The slower growth in costs between 2015 and 2020 reflects the fact that under most scenarios, new ratios have been met and the only additional costs are those associated with training and with paying higher wages as more highly qualified staff become available.

The trends observed in the costs over time are mirrored in per-child costs. By 2020, in real terms, the cost per child per day is estimated to have increased by around $4.02 under Scenario 2 to $7.86 under Scenario 4. Costs are significantly higher under Scenario 4 than Scenario 2 or 3 due to the 1:3 ratio in the 0-24 months age group, which impacts on costs in all jurisdictions (that is, no state or territory is currently operating a staff to child ratio above 1:4).

TABLE 6.2: REAL AVERAGE ANNUAL COST ESTIMATES ($REAL PER CHILD PER DAY), AUSTRALIA[28]

Scenario	Year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	0.88	1.79	2.11	2.44	2.70	3.03	3.18	3.36	3.58	3.84
Scenario 2	0.61	1.20	1.82	2.48	2.85	3.20	3.42	3.58	3.78	4.02
Scenario 3	0.78	1.50	2.13	2.76	3.12	3.26	3.42	3.58	3.78	4.02
Scenario 4	1.83	2.35	3.44	4.58	5.17	5.69	6.28	6.78	7.31	7.86

Overall costs of the new standards are dominated by the costs of achieving the new ratios. In LDC, ratio costs account for around 70% of the annual total costs over the first five years, falling to around 55% by 2020.

[27] The baseline (Scenario 1) for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline: that is, the cost estimates for scenarios 2, 3 and 4 reflect the incremental cost of reform and do not include the cost of current or anticipated reforms outlined in scenario 1. When considering the overall impact on the economy, the costs for scenarios 2, 3 and 4 should be added to the costs shown in scenario 1.

[28] The baseline (Scenario 1) for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline: that is, the cost estimates for scenarios 2, 3 and 4 reflect the incremental cost of reform and do not include the cost of current or anticipated reforms outlined in scenario 1. When considering the overall impact on the economy, the costs for scenarios 2, 3 and 4 should be added to the costs shown in scenario 1.

Table 6.3 shows the impact of the LDC scenarios on a state by state basis. Total costs are influenced heavily by LDC enrolments in each jurisdiction, hence the lion's share of costs are accounted for by Victoria, NSW and Queensland. The cost per-child per-day reflects current quality levels for each age group (i.e. the difference between the new standards and the baseline) and wage differences across states. Being the furthest from the proposed new standards, per-child costs are greatest in South Australia.

Taking Scenario 3 as an example, the costs per child per day range from $1.77 in Western Australia to $8.49 in South Australia. This difference can be explained by the fact that Western Australia is currently meeting the proposed ratios under the scenario and so is only required to meet the qualification standards, where as South Australia is required to meet the proposed staff to child ratios and the qualification standards.

TABLE 6.3: SUMMARY OF LDC COSTS BY STATE[29]

	NPC to 2020 ($m)				$ / child /day at 2020			
State	Scen. 1	Scen. 2	Scen. 3	Scen. 4	Scen. 1	Scen. 2	Scen. 3	Scen. 4
VIC	503.8	146.8	151.5	406.5	8.20	2.82	2.82	7.30
NSW	427.6	346.5	359.9	523.6	4.97	3.63	3.63	6.40
QLD	41.9	451.8	469.5	804.9	0.81	5.14	5.14	9.57
WA	10.9	45.1	45.1	107.6	0.68	1.77	1.77	5.38
TAS	14.7	13.9	17.8	32.6	2.93	2.34	2.34	5.63
SA	79.1	148.5	165.7	209.7	6.32	8.49	8.49	12.04
ACT	16.8	13.1	18.0	42.1	3.36	2.22	2.22	7.43
NT	13.6	15.7	19.5	35.4	3.78	3.37	3.37	7.49
TOTAL	1,108.3	1,181.2	1,247.0	2,157.4	3.84	4.02	4.02	7.86

For detailed results on a state by state basis see Appendix B and Appendix C and for a breakdown of the composition of total costs by age see Appendix D.

6.1.1.2 PRESCHOOL

The NPC of the costs over the ten years to 2020 associated with the proposed new preschool standards are estimated at $314.4 million for Scenario 2, $332.3 million for Scenario 3 and $473.3 million for Scenario 4 (Table 6.4). Scenario 4 differs with regard to both staff to child ratio and timing, with a 1:11 ratio by 2016 and 2015 in Scenario 2 and 3, respectively, and a 1:10 ratio by 2013 under Scenario 4. Reflecting the implementation timeline, costs increase sharply over the first three to six years, then more slowly thereafter.

As with LDC, these cost estimates capture the cost of employing additional staff to meet the new ratios, the cost of employing more highly qualified staff to meet the new qualification regulations and the training costs associated with increasing the preschool workforce to the required qualification level.

[29] The baseline (Scenario 1) for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline: that is, the cost estimates for scenarios 2, 3 and 4 reflect the incremental cost of reform and do not include the cost of current or anticipated reforms outlined in scenario 1. When considering the overall impact on the economy, the costs for scenarios 2, 3 and 4 should be added to the costs shown in scenario 1.

TABLE 6.4: PRESCHOOL COST SUMMARY TO 2020[30]

Scenario	NPC	Year				($ million)				
	to 2020	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	0.0										
Scenario 2	314.4	13.7	20.2	27.5	35.8	42.9	53.9	65.4	69.9	76.3	79.7
Scenario 3	332.3	14.6	22.0	30.5	40.1	48.7	61.5	65.4	69.9	76.3	79.7
Scenario 4	473.3	21.9	36.9	53.7	72.1	76.5	78.5	84.2	89.7	94.8	99.6

The trends observed in total costs over time are mirrored in per-child estimates. By 2020, in real terms, the cost per child per day is estimated to have increased by around $3.00 under Scenario 2 and 3 and $3.75 in Scenario 4.

TABLE 6.5: REAL AVERAGE ANNUAL PRESCHOOL COST ESTIMATES ($REAL PER CHILD PER DAY), AUSTRALIA[31]

Scenario	Year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	0.0									
Scenario 2	0.24	0.50	0.79	1.11	1.48	1.91	2.39	2.58	2.80	3.01
Scenario 3	0.28	0.58	0.92	1.30	1.73	2.23	2.39	2.58	2.80	3.01
Scenario 4	0.59	1.23	1.92	2.67	2.79	2.94	3.12	3.29	3.50	3.74

Once again, the estimates on a state by state basis vary due to the different starting positions for each state and labour force characteristics. On a per-child per-day basis, the cost impacts are greatest in Victoria and least in New South Wales.

TABLE 6.6: SUMMARY OF PRESCHOOL COSTS BY STATE[32]

	NPC to 2020 ($m)				$real / child /day at 2020			
State	Scen. 1	Scen. 2	Scen. 3	Scen. 4	Scen. 1	Scen. 2	Scen. 3	Scen. 4
VIC		216.8	231.3	322.3		6.63	6.63	7.78
NSW		20.0	20.7	26.4		0.54	0.54	0.69
QLD		11.9	12.2	38.6		1.21	1.21	3.43
WA		29.2	29.9	34.4		1.26	1.26	1.39
TAS		9.1	9.6	16.8		3.63	3.63	5.12
SA		13.4	13.9	15.3		1.28	1.28	1.41
ACT		11.7	12.4	16.9		5.25	5.25	6.10
NT		2.3	2.3	2.6		1.70	1.70	1.87
TOTAL	0.0	314.4	332.3	473.3	0.0	3.01	3.01	3.74

For detailed results on a state by state basis see Appendix B and Appendix C.

[30] As above
[31] The baseline (Scenario 1) for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline.
[32] As above

6.1.1.3 FAMILY DAY CARE

Unlike the new standards for LDC and preschool, the proposed new standards for FDC do not improve on current levels (an overall staff to child ratio of 1:7 is the current standard). The NPC of the costs to 2020 associated with the new FDC standards are therefore estimated at just $18.3 million (Table 6.7). As an increase in qualification requirements to a minimum Certificate III level is not expected to increase wages in FDC (there is currently no wage premium for Certificate III labour in FDC), the only costs observed in this sector are the cost of training the workforce to Certificate III qualification level by 2015. Hence, the majority of costs are incurred over the early years, as the current workforce is trained to Certificate III level.

Consequently, the cost impact on this sector is relatively minor with the majority of costs incurred in the first five years. In addition, training costs are assumed funded by the individual, hence the impact on the cost per child per day – and fees – is zero.

TABLE 6.7: FDC COST SUMMARY[33]

Scenario	NPC	Year				($real million)					
	to 2020	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Scenario 1	0.0										
Scenario 2	18.3	4.7	4.9	4.9	5.0	0.3	0.3	0.3	0.3	0.4	0.4

6.2 REGULATORY COSTS

The other core aspect of the NQA reforms is a new regulatory framework. As outlined above, the details of the new regulatory system are yet to be finalised, so it is not possible to give a full cost benefit analysis of the reform at this stage.

6.3 SENSITIVITY ANALYSIS

Sensitivity analysis has been conducted on key inputs within the model to determine the variability of estimated costs. This includes an analysis of the discount rate, qualified labour force growth rate and growth in demand. By way of example, the analysis focuses on Scenario 3 for LDC as the LDC sector is estimated to account for around 75% of the overall costs.

The sensitivity analysis for discount rates is based on the Office of Best Practice Regulation which recommends a base discount rate of 7%, a low case scenario of 3% and a high case scenario of 11%. Due to the costs of the NQA accruing over a ten year period, changes to the discount rate have a significant effect on the overall cost. Given a 4% decrease to the discount rate, costs increase by around 24%, around six times the change in the discount rate. Increasing the real discount rate to 11% reduces the NPC of costs to $1.0 billion – a reduction of around 18%.

[33] The baseline (Scenario 1) for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline.

TABLE 6.8: REAL DISCOUNT RATE SENSITIVITY ANALYSIS

	Total cost ($m)	Change ($m)	% change
Base (7%)	$1,247.0	-	-
Low (3%)	$1,546.3	$299.3	24.0%
High (11%)	$1,023.1	-$223.9	-18.0%

A qualified labour growth rate of 5.5% is used as the base case. The base case growth rate was developed through discussions with DEEWR on possible qualified labour supply in the child care sector. Given the higher wages paid to qualified labour versus unqualified labour, for a 1% increase in the growth rate, costs increase by around 3.0%.

TABLE 6.9: LDC QUALIFIED LABOUR GROWTH RATE SENSITIVITY ANALYSIS

	Total cost ($m)	Change ($m)	% change
Base (5.5%)	$1,247.0	-	-
Low (4.5%)	$1,198.6	-$48.4	-3.9%
High (6.5%)	$1,284.7	$37.7	3.0%

Growth in demand for childcare places under the base case is modelled on a state by state basis. The Australia wide average over the 10 years to 2020 is 1.2% per annum. The results of sensitivity analysis show that total costs increase by around twice the increase in child care demand, with a one percentage point increase in the rate of growth of demand increasing total costs by 1.8%.

TABLE 6.10: LDC DEMAND GROWTH RATE SENSITIVITY ANALYSIS

	Total cost ($m)	Change ($m)	% change
Base (1.2%)	$1,247.0	-	-
Low (0.2%)	$1,203.7	-$43.3	-3.5%
High (2.2%)	$1,269.0	$22.0	1.8%

6.4 IMPLEMENTATION

Under the assumptions employed for the growth in qualified labour (5.5% per annum), the ability to be fully compliant in the proposed timeframes is not expected to be achieved by all states under all scenarios. This is particularly the case for states which are currently operating at low staff to child ratios, and therefore have significant increases in staffing levels required, and where qualified labour is difficult to attract, for instance in remote areas.

Under Scenarios 2 and 3, full compliance (defined as all services satisfying all qualified labour requirements) in LDC and preschool is estimated to be achieved by 2019, with the qualified teacher requirement achieved by 2017. By 2015, overall, more than 85% of services are compliant. Across the states, NSW and the ACT are the first to achieve full compliance, with the Northern Territory and Western Australia the slowest.

The main challenge to full compliance lies in obtaining the required numbers of Certificate III qualified staff, with Scenarios 2 and 3 requiring a near-doubling of the number of Certificate III-qualified staff.

6.5 COMPETITION IMPACTS

6.5.1 COMPETITION IN AGGREGATE

Like any form of regulation, the proposed ECEC reforms have the potential to impact on market competition. This impact will be determined by both supply and demand factors. On the supply side, a key question is whether the reforms directly undermine the ability of any businesses to operate profitably, and hence lead to a direct reduction in competition (at least in the short term, until there is additional market entry). This depends heavily on whether services can pass through higher costs incurred as a result of the reforms, and as noted in Section 5.3.3, the nature of the ECEC market suggests this is highly likely. Competition is therefore unlikely to be reduced by services becoming unviable and exiting the market.

The other key issue for services is whether the reforms alter their capacity to compete on price. At present, industry regulation has a major bearing on operating costs, with minimum staff to child ratios meaning services have limited degrees of freedom with which to control costs. This will remain under the NQA. The standards will be higher in many jurisdictions but the same principle applies and hence scope for price competition remains constrained and is unlikely to vary significantly from the baseline.

On the demand side, the Quality Rating System will provide parents with additional information on services, meaning decision-making will be more informed and services' incentives to compete on quality – and also on price – will be stronger. This is the key area where competition impacts are likely to arise under the NQA, and indeed enhanced competition leading to natural quality improvements over time is one of the primary rationales for introducing a Quality Rating System.

More generally, while providers can and do compete on price, parents' ECEC decisions are driven heavily by factors other than price such as workforce participation and location. Though there are a lot of areas where there simply is not scope for competition (i.e. only a single provider within the local area) and this will remain the case, the presence of substitutes for formal care (such as relatives etc.) will continue to exert downward pressure on prices. Over time, it does not seem that the incentives to enter the market will be any weaker or stronger than at present. On net therefore, given the competition-enhancing role of the Quality Rating System, it is likely that, over time, the NQA will increase scope for competition in the ECEC services.

6.5.2 COMPETITION BETWEEN SERVICE TYPES

The impact of the NQA reforms will vary across different aspects of the ECEC sector, with cost – and hence price – effects differing between service types. In particular, the cost of LDC and preschool will be impacted considerably more heavily than IHC, FDC, and OSHC. As a result, it is likely that, capacity permitting, there will be some level of reallocation of demand within the industry. The extent of this substitution will depend on relative price differences and on the degree to which different services are seen as close substitutes. If, for example, FDC is not perceived by parents as an effective substitute of LDC, then there is likely to be little transfer of demand, irrespective of the price differential.

The extent of such impacts are captured through cross-price elasticities of demand, parameters which show the percentage change in demand for good A, given a one per cent change in the price of good B. At present, there is little research on cross-price elasticities in ECEC in Australia. Though a recent study of parents' ECEC choices sought to isolate the impact of price and quality on demand, it did not consider cross-price effects.

While the magnitude of such impacts therefore cannot be estimated, it is likely that there will be some shift in demand away from the most heavily impacted sectors, LDC and preschool.

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APPENDIX A: WAGE RATE ASSUMPTIONS

Wage data was sourced primarily from the ECEC Workforce Pay and Conditions Paper. Where wage data was not available through this source, it was obtained from relevant state child care awards. The sources used for wages data are listed below, with wage rates used listed in Tables B1 and B2.

- Early Childhood Education and Childcare Workforce Pay and Conditions Paper
- Children's Services (Northern Territory) Award 2005
- Teachers (Non-Government Early Childhood Service Centres other than Preschools) (State) Award 2006
- Northern Territory Public Sector Teacher and Educator 2008-2010 Union Collective Agreement
- Miscellaneous Workers – Kindergartens and Child Care Centres &C (state) Award (NSW)
- Child care (South Australia) Award
- Children's Services Government General Agreement 2004 (WA)
- Education Assistants' (Government) General Agreement (WA)
- Children's Services Award – 2006 (Queensland)
- Tasmanian Industrial Commission Child Care and Children's Services Award (Tasmania)
- ACT Department of Education and Training Teaching Staff Union Collective Agreement 2007-2009

TABLE A1: WAGES FOR LDC COSTINGS

	ACT			NT			NSW			VIC		
	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
Unqualified	29,311	29,311	29,311	29,530	31,828	30,679	31,101	32,793	31,947	29,311	29,311	29,311
Certificate III	33,572	35,919	34,746	33,824	36,182	35,003	36,786	39,108	37,947	33,572	35,919	34,746
Diploma level	39,795	41,035	40,415	36,182	42,955	39,569	39,761	48,218	43,989	39,795	41,035	40,415
University Qualified	36,476	53,727	39,511	54,290	76,351	65,321	44,607	55,736	50,171	36,813	40,688	38,750

	SA			WA			QLD			TAS		
	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
Unqualified	29,398	31,667	30,533	31,411	34,181	32,796	30,815	33,155	31,985	30,243	31,002	30,623
Certificate III	33,631	36,814	35,223	34,286	42,010	38,148	35,235	39,915	37,575	31,002	36,899	33,951
Diploma level	39,558	42,678	41,118	42,663	43,900	43,282	41,995	43,295	42,645	36,899	40,794	38,847
University Qualified	43,249	68,422	55,836	42,663	43,900	40,803	38,671	45,965	42,318	39,728	40,794	40,261

TABLE A2: WAGES USED IN PRESCHOOL COSTINGS

	ACT			NT			NSW			VIC		
	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
Assistant	33,572	35,919	34,746	37,843	49,096	43,470			34,974			42,083
4 year trained teacher (Gov)	52,128	74,279	63,204	54,290	76.351	65.321	50,522	60,933	55,728			
4 year trained teacher (Non-Gov)	52,128	74,279	63,204	54,290	76.351	65.321	42,256	52,797	47,527	53,996	73,272	63,634

	SA			WA			QLD			TAS		
	Min	Max	Average	Min	Max	Average	Min	Max	Average	Min	Max	Average
Assistant	33,631	36,814	35,223	27,892	32,726	30,309	35,235	39,915	37,575			41,871
4 year trained teacher (Gov)	43,249	68,422	55,836	47,079	64,925	56,002	59,621	68,800	64,211	40,729	50,086	45,408
4 year trained teacher (Non-Gov)	43,249	68,422	55,836	47,079	64,925	56,002	59,621	68,800	64,211	40,644	46,328	43,486

APPENDIX B: LDC AND PRESCHOOL SCENARIO SUMMARY – COST PER CHILD PER DAY

LDC Scenario 1 - Baseline

- VIC – moving to 1:4 for ages 0-36 months by 2011 and minimum certificate III requirement for all staff
- NSW – moving to 1:4 for ages 0-24 months by 2011 and minimum certificate III requirement for all staff
- SA – moving to 1:4 for ages 0-24 months by 2015 and minimum certificate III requirement for all staff
- All other states moving to a 1:4 ratio for ages 0-24 months by end-2015
- Victoria moving to a 1:12 ratio for ages 36+ months by end-2015
- NSW moving to a 1:6 ratio for ages 25-35 months by end-2015
- South Australia moving to a 1:8 ratio for ages 25-35 months by end-2015
- From 2015, phasing in of a qualified teacher in every centre-based service of 20 or more and minimum Certificate III for all staff.

The baseline for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline: that is, the cost estimates for scenarios 2, 3 and 4 reflect the incremental cost of reform and do not include the cost of current or anticipated reforms outlined in scenario 1. When considering the overall impact on the economy, the costs for scenarios 2, 3 and 4 should be added to the costs shown in scenario 1.

TABLE B1: LDC - ANNUAL COST ESTIMATES ($REAL PER CHILD PER DAY)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	2.38	4.86	5.29	5.74	6.20	6.72	6.99	7.32	7.70	8.20
NSW	1.22	2.50	3.13	3.78	4.18	4.59	4.69	4.78	4.87	4.97
QLD	0.00	0.00	0.00	0.00	0.00	0.09	0.20	0.36	0.56	0.81
WA	0.00	0.00	0.00	0.00	0.00	0.07	0.17	0.29	0.46	0.68
TAS	0.34	0.70	1.07	1.46	1.86	2.39	2.57	2.76	2.85	2.93
SA	0.58	1.17	1.80	2.47	3.19	4.18	4.60	5.09	5.66	6.32
ACT	0.39	0.79	1.21	1.64	2.09	2.65	2.82	3.03	3.27	3.36
NT	0.37	0.76	1.16	1.58	2.01	2.60	2.83	3.10	3.41	3.78
TOTAL	0.88	1.79	2.11	2.44	2.70	3.03	3.18	3.36	3.58	3.84

LDC Scenario 2

1:4 0-24 months 2015

1:5 25-36 months 2015

1:11 36+ months 2016

TABLE B2: LDC - ANNUAL COST ESTIMATES ($REAL PER CHILD PER DAY)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	0.57	0.87	1.14	1.27	1.39	1.50	1.75	2.01	2.34	2.82
NSW	0.74	1.46	2.17	2.88	3.14	3.43	3.47	3.49	3.56	3.63
QLD	0.55	1.18	1.90	2.75	3.39	3.99	4.36	4.60	4.87	5.14
WA	0.12	0.29	0.51	0.82	0.98	1.11	1.25	1.41	1.58	1.77
TAS	0.29	0.65	1.09	1.64	1.85	2.05	2.28	2.30	2.32	2.34
SA	1.50	3.07	4.72	6.46	7.22	7.67	7.89	8.10	8.30	8.49
ACT	0.20	0.47	0.82	1.28	1.50	1.82	2.16	2.18	2.20	2.22
NT	0.41	0.92	1.54	2.30	2.57	2.89	3.18	3.21	3.24	3.37
TOTAL	0.61	1.20	1.82	2.48	2.85	3.20	3.42	3.58	3.78	4.02

LDC Scenario 3

1:4 0-24 months 2011

1:5 25-36 months 2014

1:11 36+ months 2015

TABLE B3: LDC - ANNUAL COST ESTIMATES ($REAL PER CHILD PER DAY)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	0.62	0.95	1.25	1.39	1.51	1.53	1.75	2.01	2.34	2.82
NSW	0.84	1.63	2.39	3.13	3.40	3.43	3.47	3.49	3.56	3.63
QLD	0.62	1.32	2.12	3.04	3.76	4.12	4.36	4.60	4.87	5.14
WA	0.12	0.29	0.51	0.82	0.98	1.11	1.25	1.41	1.58	1.77
TAS	1.15	2.05	2.17	2.22	2.24	2.26	2.28	2.30	2.32	2.34
SA	2.61	5.03	6.44	7.52	7.67	7.78	7.89	8.10	8.30	8.49
ACT	1.17	2.04	2.06	2.10	2.12	2.14	2.16	2.18	2.20	2.22
NT	1.34	2.43	2.70	3.09	3.12	3.15	3.18	3.21	3.24	3.37
TOTAL	0.78	1.50	2.13	2.76	3.12	3.26	3.42	3.58	3.78	4.02

LDC Scenario 4

1:4 0-24 months 2010; 1:3 0-24 months 2020

1:5 25-36 months 2015

1:10 36+ months 2013

TABLE B4: LDC - ANNUAL COST ESTIMATES ($REAL PER CHILD PER DAY)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	2.59	2.32	3.38	4.29	4.61	4.88	5.42	6.00	6.63	7.30
NSW	1.74	1.83	2.80	3.84	4.42	4.96	5.57	5.84	6.12	6.40
QLD	1.17	2.44	3.83	5.37	6.22	7.04	7.64	8.26	8.90	9.57
WA	0.42	0.89	1.43	2.04	2.56	3.06	3.60	4.16	4.76	5.38
TAS	2.86	3.09	3.41	3.82	3.86	3.81	4.29	4.78	5.29	5.63
SA	4.30	5.77	7.30	8.91	9.45	9.63	10.23	10.83	11.43	12.04
ACT	3.39	3.81	4.30	4.89	4.93	4.88	5.48	6.11	6.76	7.43
NT	3.38	3.93	4.55	5.26	5.31	5.22	5.77	6.33	6.91	7.49
TOTAL	1.83	2.35	3.44	4.58	5.17	5.69	6.28	6.78	7.31	7.86

Preschool Scenario 2

1:11 by 2016

TABLE B5: PRESCHOOL - ANNUAL COST ESTIMATES ($REAL PER CHILD PER DAY)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	0.63	1.30	2.02	2.79	3.62	4.54	5.55	5.86	6.21	6.63
NSW	0.03	0.06	0.11	0.18	0.27	0.43	0.51	0.52	0.53	0.54
QLD	0.01	0.04	0.08	0.14	0.23	0.37	0.59	0.79	1.19	1.21
WA	0.03	0.08	0.14	0.22	0.34	0.50	0.70	0.85	1.04	1.26
TAS	0.21	0.45	0.72	1.02	1.38	1.81	2.35	2.67	3.08	3.63
SA	0.05	0.12	0.22	0.34	0.51	0.73	1.02	1.23	1.26	1.28
ACT	0.37	0.79	1.27	1.83	2.48	3.25	4.17	4.62	5.15	5.25
NT	0.02	0.05	0.09	0.17	0.28	0.46	0.71	0.95	1.27	1.70
TOTAL	0.24	0.50	0.79	1.11	1.48	1.91	2.39	2.58	2.80	3.01

Preschool Scenario 3

1:11 by 2015

TABLE B6: PRESCHOOL - ANNUAL COST ESTIMATES ($REAL PER CHILD PER DAY)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	0.74	1.52	2.35	3.25	4.23	5.30	5.55	5.86	6.21	6.63
NSW	0.03	0.07	0.13	0.21	0.32	0.50	0.51	0.52	0.53	0.54
QLD	0.02	0.04	0.09	0.16	0.27	0.44	0.59	0.79	1.19	1.21
WA	0.04	0.09	0.16	0.26	0.40	0.58	0.70	0.85	1.04	1.26
TAS	0.25	0.53	0.83	1.19	1.61	2.11	2.35	2.67	3.08	3.63
SA	0.06	0.14	0.25	0.40	0.60	0.85	1.02	1.23	1.26	1.28
ACT	0.43	0.92	1.48	2.13	2.89	3.79	4.17	4.62	5.15	5.25
NT	0.02	0.06	0.11	0.20	0.33	0.53	0.71	0.95	1.27	1.70
TOTAL	0.28	0.58	0.92	1.30	1.73	2.23	2.39	2.58	2.80	3.01

Preschool Scenario 4

1:10 by 2013

TABLE B7: PRESCHOOL - ANNUAL COST ESTIMATES ($REAL PER CHILD PER DAY)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	1.47	3.00	4.62	6.32	6.50	6.70	6.92	7.17	7.46	7.78
NSW	0.04	0.10	0.19	0.32	0.39	0.49	0.65	0.66	0.68	0.69
QLD	0.45	0.94	1.47	2.06	2.18	2.32	2.51	2.74	3.04	3.43
WA	0.06	0.15	0.27	0.43	0.52	0.64	0.77	0.94	1.14	1.39
TAS	0.78	1.60	2.49	3.44	3.59	3.78	4.01	4.29	4.65	5.12
SA	0.07	0.18	0.32	0.50	0.60	0.72	0.85	1.02	1.21	1.41
ACT	0.95	1.97	3.07	4.27	4.48	4.71	4.98	5.30	5.67	6.10
NT	0.03	0.09	0.18	0.33	0.44	0.58	0.78	1.05	1.40	1.87
TOTAL	0.59	1.23	1.92	2.67	2.79	2.94	3.12	3.29	3.50	3.74

APPENDIX C: LDC AND PRESCHOOL SCENARIO SUMMARY – REAL ANNUAL COST

LDC Scenario 1 - Baseline

- VIC – moving to 1:4 for ages 0-36 months by 2011 and minimum certificate III requirement for all staff
- NSW – moving to 1:4 for ages 0-24 months by 2011 and minimum certificate III requirement for all staff
- SA – moving to 1:4 for ages 0-24 months by 2015 and minimum certificate III requirement for all staff
- All other states moving to a 1:4 ratio for ages 0-24 months by end-2015
- Victoria moving to a 1:12 ratio for ages 36+ months by end-2015
- NSW moving to a 1:6 ratio for ages 25-35 months by end-2015
- South Australia moving to a 1:8 ratio for ages 25-35 months by end-2015
- From 2015, phasing in of a qualified teacher in every centre-based service of 20 or more and minimum Certificate III for all staff.

The baseline for LDC includes anticipated change by states and territories only - see Section 5.3.1 for more detail. There are no assumed changes to quality in the baseline for preschool or FDC. Results for scenarios 2-4 for all service types are relative to the baseline: that is, the cost estimates for scenarios 2, 3 and 4 reflect the incremental cost of reform and do not include the cost of current or anticipated reforms outlined in scenario 1. When considering the overall impact on the economy, the costs for scenarios 2, 3 and 4 should be added to the costs shown in scenario 1.

(See over for table.)

NPC: $1,108.3

TABLE C1: LDC – ANNUAL COST ESTIMATES ($REAL MILLIONS)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	25.5	55.2	61.2	67.2	73.5	80.3	84.5	89.4	94.9	101.8
NSW	18.2	41.8	51.4	61.3	67.1	72.5	74.7	76.6	78.7	80.8
QLD	0.0	2.7	2.9	3.0	3.2	4.6	7.0	10.2	14.5	19.6
WA	0.0	0.8	0.9	0.9	1.0	1.3	1.8	2.5	3.5	4.7
TAS	0.3	0.9	1.3	1.7	2.2	2.8	3.0	3.2	3.3	3.4
SA	1.7	4.3	6.3	8.5	11.0	14.3	15.9	17.6	19.7	22.0
ACT	0.4	1.0	1.5	2.0	2.5	3.1	3.4	3.6	3.9	4.0
NT	0.3	0.7	1.1	1.5	1.9	2.5	2.7	3.0	3.3	3.7
TOTAL	46.4	107.5	126.5	146.2	162.3	181.4	192.9	206.1	221.8	240.0

LDC Scenario 2

1:4 0-24 months 2015

1:5 25-36 months 2015

1:11 36+ months 2016

NPC: $1,181.2

TABLE C2: LDC – ANNUAL COST ESTIMATES ($REAL MILLIONS)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	6.1	13.1	16.5	18.3	20.1	21.8	25.2	28.8	33.3	35.2
NSW	11.8	31.0	43.2	55.5	60.6	58.1	59.0	59.8	61.6	63.2
QLD	9.4	25.6	39.4	55.9	69.1	82.0	90.9	97.4	104.5	111.7
WA	0.6	2.9	4.1	5.8	6.7	7.6	8.5	9.6	10.8	12.0
TAS	0.3	1.0	1.5	2.1	2.4	2.6	2.9	2.5	2.5	2.5
SA	4.5	10.7	16.1	21.8	24.5	26.4	27.5	28.4	29.5	30.4
ACT	0.2	0.9	1.3	1.8	2.1	2.5	2.9	3.0	2.5	2.6
NT	0.3	1.0	1.5	2.2	2.5	2.8	3.2	3.2	3.3	3.5
TOTAL	33.2	86.2	123.6	163.5	188.2	203.9	220.1	232.7	247.9	261.0

LDC Scenario 3

1:4 0-24 months 2011

1:5 25-36 months 2014

1:11 36+ months 2015

NPC: $1,247.0

TABLE C3: LDC – ANNUAL COST ESTIMATES ($REAL MILLIONS)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	6.6	13.9	17.7	19.7	21.5	22.2	25.2	28.8	33.3	35.2
NSW	13.4	33.8	46.8	59.6	64.9	58.1	59.0	59.8	61.6	63.2
QLD	10.6	28.1	43.3	61.2	76.0	84.5	90.9	97.4	104.5	111.7
WA	0.6	2.9	4.1	5.8	6.7	7.6	8.5	9.6	10.8	12.0
TAS	1.1	2.5	2.6	2.7	2.8	2.9	2.9	2.5	2.5	2.5
SA	7.9	16.7	21.5	25.2	26.0	26.8	27.5	28.4	29.5	30.4
ACT	1.2	2.5	2.6	2.7	2.7	2.8	2.9	3.0	2.5	2.6
NT	1.1	2.2	2.5	2.9	3.0	3.1	3.2	3.2	3.3	3.5
TOTAL	42.4	102.6	141.2	179.8	203.7	207.9	220.1	232.7	247.9	261.0

LDC Scenario 4

1:4 0-24 months 2010; 1:3 0-24 months 2020

1:5 25-36 months 2015

1:10 36+ months 2013

NPC: $2,157.4

TABLE C4: LDC – ANNUAL COST ESTIMATES ($REAL MILLIONS)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC	27.6	29.0	41.7	52.7	57.3	61.4	68.6	76.5	85.0	94.1
NSW	27.7	37.1	53.6	71.4	81.9	91.9	94.2	99.4	105.0	110.6
QLD	20.0	47.7	74.1	103.9	121.9	140.1	154.3	169.4	185.0	201.5
WA	2.0	5.8	8.6	11.9	14.8	17.7	20.9	24.4	28.0	31.9
TAS	2.9	3.5	3.9	4.4	4.5	4.5	5.1	5.6	6.2	6.0
SA	13.0	19.0	24.2	29.6	31.7	32.8	35.2	37.5	40.0	42.3
ACT	3.4	4.3	4.9	5.6	5.8	5.8	6.6	7.3	8.1	9.0
NT	2.8	3.5	4.2	4.9	5.0	5.0	5.5	6.1	6.7	7.4
TOTAL	99.3	150.1	215.3	284.4	322.9	359.2	390.5	426.3	464.1	502.9

NB Preschool scenario 1 has zero cost.

Preschool Scenario 2

1:11 by 2016

NPC: $219.1 m

TABLE C5: PRESCHOOL – ANNUAL COST ESTIMATES ($REAL MILLIONS)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC*	6.8	11.9	17.6	23.8	30.6	38.2	46.7	49.8	53.3	57.3
NSW	2.4	2.7	3.1	3.6	1.8	2.6	3.1	3.2	3.2	3.3
QLD	0.9	1.0	1.1	1.3	1.5	1.9	2.5	2.1	3.1	3.1
WA	1.9	2.2	2.6	3.1	3.8	4.7	5.9	6.8	7.9	6.9
TAS	0.4	0.5	0.7	0.9	1.2	1.5	1.9	2.1	2.4	2.4
SA	0.9	1.1	1.3	1.6	2.0	2.6	2.2	2.8	2.8	2.9
ACT	0.4	0.6	0.9	1.2	1.6	2.1	2.6	2.6	2.9	3.0
NT	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.7	0.9
TOTAL	13.7	20.2	27.5	35.8	42.9	53.9	65.4	69.9	76.3	79.7

* Cost estimates for Victoria exclude approximately 9,000 state government funded enrolments in long day care.

Preschool Scenario 3

1:11 by 2015

NPC: $230.7m

TABLE C6: PRESCHOOL – ANNUAL COST ESTIMATES ($REAL MILLIONS)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC*	7.5	13.5	20.1	27.3	35.2	44.1	46.7	49.8	53.3	57.3
NSW	2.4	2.8	3.2	3.8	2.1	3.0	3.1	3.2	3.2	3.3
QLD	0.9	1.0	1.1	1.3	1.6	2.1	2.5	2.1	3.1	3.1
WA	1.9	2.3	2.7	3.3	4.1	5.1	5.9	6.8	7.9	6.9
TAS	0.4	0.6	0.8	1.0	1.3	1.7	1.9	2.1	2.4	2.4
SA	0.9	1.1	1.4	1.8	2.2	2.8	2.2	2.8	2.8	2.9
ACT	0.4	0.7	1.0	1.4	1.8	2.4	2.6	2.6	2.9	3.0
NT	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.5	0.7	0.9
TOTAL	14.6	22.0	30.5	40.1	48.7	61.5	65.4	69.9	76.3	79.7

* Cost estimates for Victoria exclude approximately 9,000 state government funded enrolments in long day care.

Preschool Scenario 4

1:10 by 2013

NPC: $339.4

TABLE C7: PRESCHOOL – ANNUAL COST ESTIMATES ($REAL MILLIONS)

State	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
VIC*	12.7	24.3	36.9	50.4	52.6	54.9	57.4	60.1	63.1	66.5
NSW	2.7	3.1	3.7	4.6	5.1	2.9	3.9	4.0	4.1	4.1
QLD	1.8	2.9	4.1	5.5	5.9	6.4	7.0	7.7	8.5	9.7
WA	2.2	2.7	3.4	4.3	4.9	5.6	6.4	7.4	8.7	7.5
TAS	0.7	1.3	1.9	2.5	2.7	2.8	3.0	3.2	3.5	3.8
SA	1.0	1.3	1.6	2.1	2.3	2.6	3.0	3.4	2.7	3.1
ACT	0.7	1.2	1.9	2.5	2.7	2.9	3.1	3.3	3.5	3.8
NT	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.9
TOTAL	21.9	36.9	53.7	72.1	76.5	78.5	84.2	89.7	94.8	99.6

* Cost estimates for Victoria exclude approximately 9,000 state government funded enrolments in long day care.

APPENDIX D: DETAILED LDC RESULTS TABLES

LDC SCENARIO 2

AGE	Proposed ratio	Ratio costs (% total)	Qual. costs (% total)	Share of total costs
NSW				
0-1	1:4	0.0%	1.8%	1.8%
1-2	1:4	0.0%	6.6%	6.6%
2-3	1:5	39.8%	13.5%	53.3%
3+	1:11	0.0%	38.2%	38.2%
		39.8%	**60.2%**	**100.0%**
VIC				
0-1	1:4	0.0%	3.2%	3.2%
1-2	1:4	0.0%	12.1%	12.1%
2-3	1:5	0.0%	17.0%	17.0%
3+	1:11	30.4%	37.3%	67.7%
		30.4%	**69.6%**	**100.0%**
QLD				
0-1	1:4	0.0%	1.9%	1.9%
1-2	1:4	0.0%	6.4%	6.4%
2-3	1:5	37.1%	9.8%	46.9%
3+	1:11	20.1%	24.8%	44.9%
		57.2%	**42.8%**	**100.0%**
WA				
0-1	1:4	0.0%	4.5%	4.5%
1-2	1:4	0.0%	17.2%	17.2%
2-3	1:5	0.0%	25.3%	25.3%
3+	1:11	0.0%	53.0%	53.0%
		0.0%	**100.0%**	**100.0%**
TAS				
0-1	1:4	0.0%	5.2%	5.2%
1-2	1:4	0.0%	17.3%	17.3%
2-3	1:5	0.0%	23.0%	23.0%
3+	1:11	0.0%	54.5%	54.5%
		0.0%	**100.0%**	**100.0%**
SA				
0-1	1:4	0.0%	3.4%	3.4%
1-2	1:4	0.0%	11.4%	11.4%
2-3	1:5	40.1%	15.7%	55.8%
3+	1:11	0.0%	29.5%	29.5%
		40.1%	**59.9%**	**100.0%**
ACT				
0-1	1:4	0.0%	6.1%	6.1%
1-2	1:4	0.0%	20.7%	20.7%
2-3	1:5	0.0%	25.8%	25.8%
3+	1:11	0.0%	47.5%	47.5%
		0.0%	**100.0%**	**100.0%**
NT				
0-1	1:4	0.0%	6.1%	6.1%
1-2	1:4	0.0%	18.5%	18.5%
2-3	1:5	0.0%	24.9%	24.9%
3+	1:11	0.0%	50.4%	50.4%
		0.0%	**100.0%**	**100.0%**

LDC SCENARIO 3

AGE	Proposed ratio	Ratio costs (% total)	Qual. costs (% total)	Share of total costs
NSW				
0-1	1:4	0.0%	1.8%	1.8%
1-2	1:4	0.0%	6.4%	6.4%
2-3	1:5	41.9%	13.1%	55.0%
3+	1:11	0.0%	36.9%	36.9%
		41.9%	***58.1%***	***100.0%***
VIC				
0-1	1:4	0.0%	3.1%	3.1%
1-2	1:4	0.0%	11.8%	11.8%
2-3	1:5	0.0%	16.5%	16.5%
3+	1:11	32.3%	36.3%	68.6%
		32.3%	***67.7%***	***100.0%***
QLD				
0-1	1:4	0.0%	1.8%	1.8%
1-2	1:4	0.0%	6.2%	6.2%
2-3	1:5	38.0%	9.4%	47.4%
3+	1:11	20.7%	23.9%	44.6%
		58.7%	***41.3%***	***100.0%***
WA				
0-1	1:4	0.0%	4.5%	4.5%
1-2	1:4	0.0%	17.2%	17.2%
2-3	1:5	0.0%	25.3%	25.3%
3+	1:11	0.0%	53.0%	53.0%
		0.0%	***100.0%***	***100.0%***
TAS				
0-1	1:4	4.7%	4.1%	8.8%
1-2	1:4	16.3%	13.7%	30.0%
2-3	1:5	0.0%	18.2%	18.2%
3+	1:11	0.0%	43.0%	43.0%
		21.0%	***79.0%***	***100.0%***
SA				
0-1	1:4	1.5%	3.0%	4.5%
1-2	1:4	5.2%	10.2%	15.4%
2-3	1:5	39.2%	14.1%	53.3%
3+	1:11	0.0%	26.6%	26.6%
		46.0%	***54.0%***	***100.0%***
ACT				
0-1	1:4	5.6%	4.6%	10.2%
1-2	1:4	19.3%	15.5%	34.8%
2-3	1:5	0.0%	19.4%	19.4%
3+	1:11	0.0%	35.7%	35.7%
		24.9%	***75.1%***	***100.0%***
NT				
0-1	1:4	3.7%	5.1%	8.8%
1-2	1:4	12.7%	15.5%	28.2%
2-3	1:5	0.0%	20.9%	20.9%
3+	1:11	0.0%	42.2%	42.2%
		16.3%	***83.7%***	***100.0%***

LDC SCENARIO 4

AGE	Proposed ratio	Ratio costs (% total)	Qual. costs (% total)	Share of total costs
NSW				
0-1	1:3	5.7%	1.5%	7.2%
1-2	1:3	19.7%	5.4%	25.1%
2-3	1:5	25.8%	11.0%	36.8%
3+	1:10	0.0%	31.0%	31.0%
		51.1%	***48.9%***	***100.0%***
VIC				
0-1	1:3	7.4%	1.7%	9.1%
1-2	1:3	25.4%	6.5%	31.9%
2-3	1:5	0.0%	9.1%	9.1%
3+	1:10	29.8%	20.0%	49.8%
		62.6%	***37.4%***	***100.0%***
QLD				
0-1	1:3	6.5%	1.0%	7.5%
1-2	1:3	22.4%	3.4%	25.8%
2-3	1:5	20.1%	5.1%	25.2%
3+	1:10	28.5%	13.0%	41.5%
		77.6%	***22.4%***	***100.0%***
WA				
0-1	1:3	14.9%	1.5%	16.4%
1-2	1:3	51.4%	5.8%	57.2%
2-3	1:5	0.0%	8.5%	8.5%
3+	1:10	0.0%	17.9%	17.9%
		66.3%	***33.7%***	***100.0%***
TAS				
0-1	1:3	12.5%	2.3%	14.8%
1-2	1:3	42.9%	7.7%	50.6%
2-3	1:5	0.0%	10.3%	10.3%
3+	1:10	0.0%	24.3%	24.3%
		55.4%	***44.6%***	***100.0%***
SA				
0-1	1:3	6.0%	2.6%	8.6%
1-2	1:3	20.6%	8.6%	29.2%
2-3	1:5	28.1%	11.9%	40.0%
3+	1:10	0.0%	22.4%	22.4%
		54.6%	***45.4%***	***100.0%***
ACT				
0-1	1:3	10.7%	2.4%	13.1%
1-2	1:3	36.9%	8.1%	45.0%
2-3	1:5	0.0%	10.1%	10.1%
3+	1:10	13.2%	18.6%	31.8%
		60.8%	***39.2%***	***100.0%***
NT				
0-1	1:3	9.8%	2.6%	12.4%
1-2	1:3	33.7%	7.9%	41.6%
2-3	1:5	0.0%	10.6%	10.6%
3+	1:10	14.0%	21.4%	35.4%
		57.5%	***42.5%***	***100.0%***