MATERNAL EMPLOYMENT AND THE COST OF CHILDCARE IN IRELAND

HELEN RUSSELL, FRANCES MCGINNITY, ÉAMONN FAHEY AND OONA KENNY

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Helen Russell

Frances McGinnity

Éamonn Fahey

Oona Kenny

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THE AUTHORS

Helen Russell is a Research Professor at the Economic and Social Research Institute (ESRI) and an Adjunct Professor at Trinity College Dublin (TCD). Frances McGinnity is an Associate Research Professor at the ESRI and an Adjunct Professor at Trinity College Dublin (TCD). Éamonn Fahey is a research assistant at the ESRI. Oona Kenny is a researcher at the Housing Agency and formerly a research assistant at the ESRI.

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This report has been accepted for publication by the Institute, which does not itself take institutional policy positions. All ESRI Research Series reports are peer reviewed prior to publication. The authors are solely responsible for the content and the views expressed. Pobal, the DCYA, CSO and DEASP take no responsibility for the views expressed by the Authors.

TABLE OF CONTENTS

EXECUTIVE SUMMARY VII

CHAPTER 1 MOTHERS' EMPLOYMENT AND CHILDCARE COSTS: POLICY AND PREVIOUS RESEARCH 1

1.1 Introduction 1

1.2 Conceptual model of employment and care decisions 2

1.3 Policy context in Ireland 2

1.3.1 State intervention in pre-school childcare 4

1.3.2 State intervention in after-school childcare 7

1.3.3 Regulation of childminders 8

1.3.4 The costs of childcare – an issue for policy 9

1.4 Labour market context: boom and bust 10

1.5 Literature review 12

1.5.1 Employment transitions of mothers with young children 12

1.5.2 Maternal employment and childcare costs 15

1.6 Current study: childcare costs and maternal employment in Ireland 18

CHAPTER 2 DATA AND METHODOLOGY 21

2.1 About *Growing Up in Ireland* 21

2.2 Measures used 22

2.2.1 Use of childcare 22

2.2.2 Childcare costs 23

2.2.3 Socio-demographic variables 23

2.2.4 Family/household variables 24

2.2.5 Labour market variables 25

2.3 Statistical modelling 26

CHAPTER 3 MAPPING CARE COSTS TO PARENTS 29

3.1 Introduction 29

3.2 Childcare statistics – the first three years 30

3.2.1 Use of non-parental childcare in the first three years 30

3.2.2 Hourly and weekly costs at age 3 31

3.2.3 Costs at age 3 for different families 33

3.2.4 Childcare costs as a proportion of household income 36

3.3 Who pays for childcare and who pays most at age 3? 39

3.3.1 Modelling the use of paid childcare at age 3 39

3.3.2 Modelling the cost of childcare at age 3 41
3.4 Childcare statistics at age 5 43
3.4.1 Type and cost of after-school care at age 5 43
3.4.2 Childcare transitions – age 3 to 5 44
3.5 Summary 45

CHAPTER 4 MATERNAL EMPLOYMENT 49
4.1 Introduction 49
4.2 Change in maternal employment over time 49
4.3 Maternal employment at age 5 52
4.4 Assessing the effect of childcare costs 55
4.4.1 Results 57
4.4.2 Does the Effect of Childcare Cost Differ by Household Income? 58
4.5 Summary 59

CHAPTER 5 CONCLUSION 61
5.1 Childcare cost in the first five years 61
5.2 Factors influencing maternal employment 63
5.2.1 The effect of childcare 63
5.2.2 Other influences on maternal labour supply 64
5.3 Strengths, limitations and issues for further research 65
5.4 Policy implications 66
5.4.1 Types of childcare 68

REFERENCES 71

APPENDICES 77

LIST OF TABLES

Table 1.1 Main services and provisions of early care and education, Ireland when GUI children were age 3 (2011) 5
Table 2.1 Socio-demographic variables – *Growing Up in Ireland* 24
Table 2.2 Family/household variables – *Growing Up in Ireland* 25
Table 2.3 Labour market variables – *Growing Up in Ireland* 26
Table 3.1 Use of multiple care types at age 3 31
Table 3.2 GUI childcare statistics at age 3 33
Table 3.3 Main childcare cost for Study Child as a proportion of disposable income 37
Table 3.4 Main childcare cost for Study Child as proportion of household income by income decile 38
Table 3.5 Main childcare cost for Study Child as proportion of household income by social class 39
Table 3.6 Logistic regression model of use of paid childcare at Wave 2 40
Table 3.7 OLS regression model of childcare costs at Wave 2 (paid care only) 42
Table 3.8 GUI childcare statistics at age 5 for school-going children 44
Table 3.9 Childcare transitions: after-school childcare at age 5 by care arrangement at age 3 45
Table 4.1 Changes in paid work hours between Wave 2 and Wave 3 52
Table 4.2 Factors influencing maternal employment 53
Table 4.3 OLS regression models of hours of paid work at Wave 3 55
Table 4.4 OLS regression model of hours of paid work at Wave 3 58
Table A1.1 Pobal Early Years survey average weekly childcare fees 77
Table A3.1 Average weekly fees from 2011 Pobal survey of early years services 77
Table A3.2 Childcare costs adjusted for inflation (2017 prices) 78
Table A3.3 Childcare costs by care type used at three years of age for only children (main care) 78
Table A3.4 Costs of total care (main and secondary care) 78
Table A3.5 Total care cost as percentage of weekly disposable income by family type 79
Table A3.6 Comparison of childcare costs: GUI and QNHS 79
Table A4.1 Logistic regression model of employment at Wave 3 80
Table A4.2 OLS regression model of hours of work at Wave 3 among employed 81
Table A4.3 OLS regression model of log weekly cost with region at Wave 2 82
Table A4.4 OLS regression model of hours of work at Wave 3 82
Table A4.5 Critical values 83
Table A4.6 Selection model, use of paid childcare at Wave 2 83
Table A4.7 Selection model, employment at Wave 2 84
Table A4.8 OLS regression model of maternal work hours Wave 3 with income controls 85

LIST OF FIGURES

Figure 1.1 A conceptual model of decision-making regarding employment and childcare 3
Figure 1.2 Net cost of full-time childcare for dual earner and lone parent families as a proportion of net family income (2012) 10
Figure 1.3 Labour market participation and employment rates for men and women in Ireland, 1990-2016 11
Figure 2.1 The *Growing Up in Ireland* infant cohort 21
Figure 3.1 Main type of childcare at 9 months and 3 years 30
Figure 3.2 Mean hourly childcare cost and percentage unpaid for study child at age 3 by family income quintile 34
Figure 3.3 Mean hourly childcare cost and percentage unpaid for Study Child at age 3 by social class 35
Figure 3.4 Mean hourly childcare cost and percentage unpaid for Study Child at age 3 by region 36
Figure 3.5 Main childcare cost for Study Child as proportion of household income by care hours per week 37
Figure 4.1 Mothers employment status in the first five years after birth of Study Child 50
Figure 4.2 Changes in employment from Wave 1 to Wave 2 51
Figure 4.3 Changes in employment from Wave 2 to Wave 3 52

EXECUTIVE SUMMARY

Childcare has become an increasingly salient issue for Irish society as the proportion of women with young children in the workforce has grown over recent decades. International comparisons of the price of formal care for pre-school children indicate that Ireland has one of the highest costs as a proportion of household income across the OECD.

The costs of childcare are frequently invoked as a barrier to maternal employment, especially for low-income groups and lone parents. However, there are relatively few systematic analyses of the real costs for families or of how these costs influence employment outcomes for mothers.

This study draws on information from the *Growing Up in Ireland* (GUI) Survey to investigate childcare costs for children up to the age of five, with a particular focus on costs at age three before children enter the school system, which is the peak period for participation in non-parental childcare in terms of both the numbers of children and hours of childcare. The GUI is the largest source of nationally representative data on the types and costs of childcare for pre-school children in Ireland.

COSTS OF CARE TO PARENTS AT AGE 3

In 2011, when the children were three years (36 months) old, half of the GUI children were in non-parental care for at least eight hours a week. Of those in non-parental care, over half were in centre-based care (54 per cent); 22 per cent were in the care of a relative and 24 per cent were looked after by childminders, either in the childminder's home or the child's home. Those who paid for care used an average of 24 hours of childcare per week for the main care type, at a mean cost of €105 per week or €4.50 per hour. Evidence from other sources (Pobal, 2017; CSO, 2018) suggests that the prices for formal childcare changed relatively little in the intervening time period.[1]

A childminder in the family's home was the most expensive form of care, costing €5.70 per hour and €153 per week, on average. The hourly costs of a childminder outside the home were close to those paid for centre-based care (just under

[1] Annual surveys by Pobal on the fees charged by childcare providers for centre-based childcare show an increase of 5 per cent in the fee for full-time care over the six-year period between 2011 and 2016 (Pobal 2017). The CSO Consumer Price Index suggests that there was an increase of 7 per cent in childcare prices between 2011 and 2017. Uprating these for inflation produces an average cost of €112 per week and €4.84 per hour at 2017 prices.

€4.50 per hour),[2] though the mean weekly costs were somewhat higher for the former (€107) compared to the latter (€100). Over half of all relative care was provided free of charge. Among those paying for relative care, the average cost was €90 per week. In total, 15 per cent of those using regular childcare for their child at age three received this care free of charge.

Higher care costs were not accounted for by factors such as region, family income and maternal education. Compared to paid relative care, we found that centre-based care cost 16 per cent more per hour, care by a childminder outside the child's home cost 17 per cent more, and care by a childminder in the child's home cost 33 per cent more.

PROPORTION OF INCOME SPENT ON CHILDCARE

On average, families paying for care spent 12 per cent of disposable income on the care of the three-year-old Study Child. This rose to 16 per cent for lone parent families and 20 per cent for those in the bottom income decile. As these costs relate only to the Study Child, families with other young children are likely to spend a considerably higher proportion of their income on childcare.

MATERNAL EMPLOYMENT

The majority of mothers (54 per cent) were in paid employment when their child was 36 months old, up from 46 per cent when the child was 9 months old. By the time the Study Child was aged five years, 59 per cent of women were in employment.

There is a considerable fluidity in mothers' employment in the early years after the birth of a child. For example, between Wave 2 (child aged three years) and Wave 3 (child aged five years), 9 per cent of women entered employment, 7 per cent left and 9 per cent changed between full and part-time hours. Even this understates the level of change. Almost half (49 per cent) of women changed the number of hours they worked between the second and third waves. Debates that dichotomise women into one group of full-time carers permanently outside the labour market ('stay-at-home mothers') and another group of permanent full-time workers ('working mothers') does not do justice to the range of experiences actually found.

[2] The figure of €5.70 for childminders refers to the cost for the study child only. In most cases, childminders look after more than one child in the family, so it is usually not indicative of their earned wage. However, it is likely that some are paid below the minimum wage, which for most of the duration of the survey fieldwork in 2011 stood at €7.65 per hour.

The longitudinal nature of GUI means that we can examine whether childcare costs when the child was three made a difference to maternal employment two years later. An instrumental variables approach allows us to account for endogeneity, in this case the fact that families with higher levels of employment and earning power tend to pay more for childcare. Using this approach, we find that among those paying for childcare when the child was aged three, the cost of care was associated with a small reduction in hours of paid work when the child was aged five years. A 10 per cent increase in childcare cost is associated with half an hour less paid employment per week. Moreover, the effect of childcare costs interacts with household income so that for households with lower income the negative effect is larger. Thus, childcare costs appear to be a stronger barrier for low-income families.

POLICY IMPLICATIONS

The children in the GUI study were one of the first cohorts eligible for the Free Preschool Year scheme (officially the Early Childhood Care and Education scheme, ECCE) and almost 96 per cent of the group participated. Our analysis is based on cost of childcare measured at 36 months, before the children took up these places. The results therefore measure the costs before families become eligible for the scheme (the starting age has since been lowered to 36 months and the duration of the scheme has been extended to two years, see Chapter 1). Given the universal nature of the scheme and the very high take-up in our sample, we assume that the relativities in costs between those with different characteristics remained the same over the period, as all households benefited from the same subsidy.

Our analysis suggests that childcare costs act as more of a barrier to employment for households with lower income. The precursor to the Affordable Childcare Scheme (ACS) introduced in September 2017 is designed to provide more targeted childcare cost supports for low-income families as well as a universal element. The GUI data pre-date the scheme; however, the principle of providing greater supports to low income families is supported by the current analysis. Policies to address childcare costs are also important from a poverty perspective, as exclusion from the labour market due to childcare costs will increase poverty risks and household joblessness. Increased female employment also has benefits for the sustainability of the welfare state through increased tax receipts.

The report also reiterates the importance of childminding and relative care for Irish families. Provision of subsidies directly to registered providers, as in the ECCE and ACS, provides the State with an important means to influence quality and supply of childcare. Efforts to bring childminders into the registration system will therefore be crucial if significant capacity and parental choice is not to be lost.

CHAPTER 1

Mothers' Employment and Childcare Costs: Policy and Previous Research

1.1 INTRODUCTION

The cost of childcare for parents of pre-school children has been a salient and politicised issue in Ireland for a number of years now. This is in the context of a rapid rise in women's employment in Ireland in recent decades, with a rapid expansion of childcare provision but with low state investment in the sector in comparative terms (OECD, 2007). Successive comparative analyses of childcare costs show childcare costs to parents in Ireland to be among the highest in the OECD (OECD, 2007; 2014).

Concern around the high cost of childcare in Ireland was expressed by the European Commission in 2016.[3] As part of its Country Specific Recommendations (CSRs), the Commission recommended that Ireland '[i]mprove the provision of quality, affordable full-time childcare' (EU Commission, July 2016 p.4). In reviewing Ireland's progress on these CSRs in 2017 the Commission commented that '[t]he availability and cost of quality fulltime childcare present barriers to female labour market participation and hinder efforts to reduce child poverty' and recommended that Ireland '[e]nhance social infrastructure, including social housing and quality childcare' (EU Commission, May 2017 p.6, p.8).[4]

Costs are relevant to which families use childcare, to female employment and household joblessness and to child poverty. Gambaro et al. (2014) have shown that use of childcare varies considerably across countries, depending on who bears the cost. In terms of female employment, employment breaks associated with motherhood can not only result in an immediate loss of income for women, but also put them on a lower wage trajectory (Dex et al., 1998; Connolly and Gregory, 2008). Evidence also suggests that mothers' employment can also play a role in preventing child poverty in Ireland (Watson et al., 2012). A recent OECD report finds that childcare costs are an important factor in understanding household joblessness (OECD, 2017).

Using data from the infant cohort of the *Growing Up in Ireland* (GUI) survey, this report has two main aims. Firstly to examine in detail the costs of pre-school and after-school childcare to parents in Ireland; and secondly to investigate how

[3] See Council Recommendation C 299/16.
[4] See Council Recommendation COM(2017) 507 final.

childcare costs impact on mothers' hours of paid work. The GUI survey is the largest nationally representative data source on the costs of childcare to families with pre-school children. In addition to extensive information on family background, the longitudinal design of the GUI allows us to follow families over time, tracking changes in maternal employment and childcare practices. The main focus is on childcare costs at age three; before the free pre-school year, but this is supplemented with analysis of childcare costs at 9 months and 5 years. This is the first major study linking prior childcare costs to mothers' employment in Ireland.

1.2 CONCEPTUAL MODEL OF EMPLOYMENT AND CARE DECISIONS

Figure 1.1 presents a conceptual model of employment and care decisions that underpins much of this study. The model draws on work by Sylva et al. (2007) and Pungello and Kurtz-Costes (1999) in their analysis of childcare. It places the selection and timing of childcare in a series of nested contexts including child, parental, family, neighbourhood and macro context, which all contribute to (and are influenced by) the mother's decision to return to work and the choice of childcare. The 'macro level' here includes government policy and the labour market context.

While this is a useful model for understanding the care of infants, it is of course a simplification of the process. We have added hours of work into the model as this is a crucial element of the decision and has significant implications for care costs. Furthermore, the figure does not include all possible factors and, perhaps more saliently, does not incorporate all possible directions of effect. The implications of care, in terms of outcomes, are likely to feed back into beliefs and attitudes towards childcare.

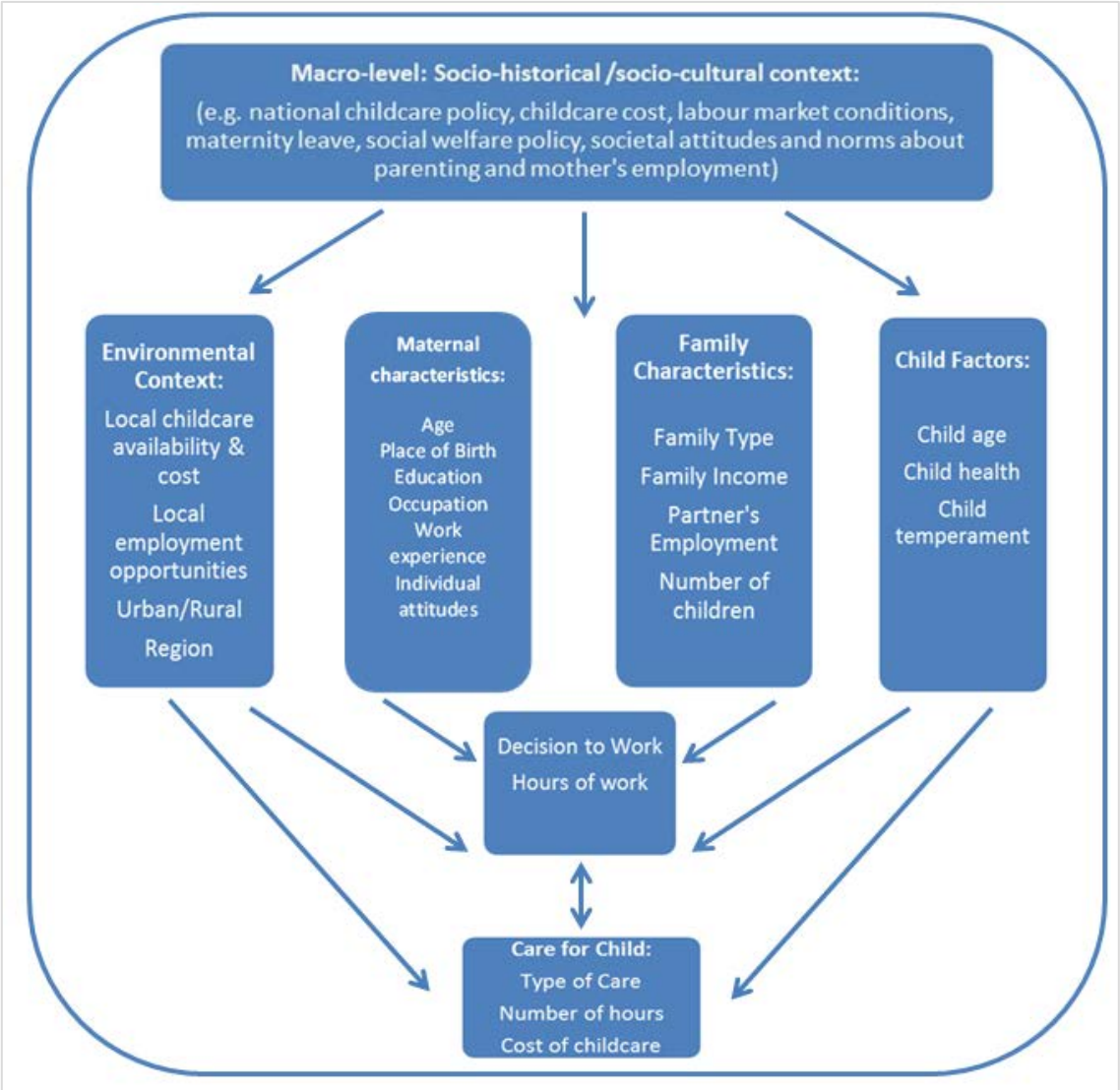
1.3 POLICY CONTEXT IN IRELAND

Following Figure 1.1, this section considers the more 'macro-level' factors including relevant policies and State supports that may influence the decisions to access non-parental childcare in the context of maternal employment.

Table 1.1 presents an overview of the main services and provisions of early care and education in Ireland. Note the focus is provision of services in 2011 and 2013 when the children in the GUI were aged three and five, but the text gives details of important changes since then. Mothers' employment is related to both paid and unpaid leave provision, as well as state support for childcare and childcare costs. The timing of returning to work for mothers after childbirth is particularly sensitive to maternity leave provision (McGinnity et al., 2013; Russell et al., 2011). While this report primarily focuses on mothers' employment when the children are aged three and five, leave provision around childbirth may also be

relevant for mothers who have had a second child. The duration of maternity leave – 26 weeks paid leave and 16 weeks unpaid leave – now compares reasonably well to other European countries, though the relatively low maximum threshold means that the statutory replacement rate for maternity benefit in Ireland falls below the level found in a number of comparable EU countries (Moss, 2015). Take-up of paid maternity leave in Ireland is very high, estimated at between 85-92 per cent of all mothers, and of those who take leave, 90 per cent take the full 26-week entitlement (McGinnity et al., 2013; Russell et al., 2011). In the *Pregnancy at Work* survey Russell et al. (2011) found that just under half of women receive top-up payments from their employer while they are on maternity leave. These mothers tend to be from more advantaged backgrounds in terms of income and education, and be working in the public sector or large organisations (see Russell et al. (2011) for more details).

FIGURE 1.1 A CONCEPTUAL MODEL OF DECISION-MAKING REGARDING EMPLOYMENT AND CHILDCARE



Source: Adapted from Sylva et al. (2007) and Pungello and Kurtz-Costes (1999).

1.3.1 State intervention in pre-school childcare

Until 2010, the Irish Government had resisted direct investment in universal childcare, preferring instead a focus on targeted funding for disadvantaged families using childcare services in the community and voluntary sector[5] (see Table 1.1), and market based policies of cash payments such as child benefit, which is paid to all parents, irrespective of childcare use (McGinnity et al., 2013; Hayes, 2006).[6] During the economic boom years, sustained demand for financial support towards the cost of childcare intensified and between 2000 and 2005, the Child Benefit payment increased by more than two and a half times (CPA, 2005). Subsequently, Budget 2006 introduced the so-called 'Early Childcare Supplement'; a monthly payment to assist parents in accessing childcare in the private market, though parents received the payment regardless of whether or not they were using childcare. This scheme was criticised because the payment was not linked to participation in the labour market and it was extremely costly (OECD, 2007; Hayes and Bradley, 2009).[7] Alongside this, capital grants were made available to private and community providers of childcare leading to an expansion of more than 40,000 childcare places across the sector between 2000 and 2010, a figure which equates to one extra place for every 24 children under the age of 15 in 2010 (Department of Education and Science, 2009; CSO, 2017). While a subsidy to parents was allowed under these grants to reduce childcare costs, this was only available within the community sector, which meant that places were limited to geographically disadvantaged areas in which community provision is more common. In 2011, 25 per cent of three-year-old children attending childcare centres were in community crèches (McGinnity et al., 2013). In the same year, a sectoral survey carried out by Pobal (2012; p.6) found that approximately 30 per cent of childcare centres were in the community sector.[8]

[5] Community (or voluntary) providers of childcare operate on a not-for-profit basis while private providers operate as a business.

[6] Child benefit is payable to the parents or guardians of children under 16 years of age, or under 18 years of age if the child is in full-time education.

[7] This scheme was discontinued in December 2009.

[8] More recent data from the 2015-2016 Early Years Service Profile Survey suggest that this figure has changed little, at approximately 29 per cent (Pobal, 2016; p.10).

TABLE 1.1 MAIN SERVICES AND PROVISIONS OF EARLY CARE AND EDUCATION, IRELAND WHEN GUI CHILDREN WERE AGE 3 (2011)[#]

Age of Child	Maternity (and paternity leave)	Parental leave	Centre-based care	Childminders	School
Under age 1	Paid maternity leave*: 26 weeks. Unpaid maternity leave: 16 weeks (Paternity leave: unpaid, two weeks since September 2016).	Parental leave (unpaid): 14 weeks can be taken by each parent until the child reaches age 8.**	A mixture of private providers and community crèches in disadvantaged areas.*** Some targeted subsidies paid to providers, but high costs to most parents.	Private childminders in their home or the child's home. No subsidies available. Very few registered.	-
Aged 1-2	-	See above	See above	Similar to above	-
Aged 3	-	See above	Early Childhood Care and Education (ECCE) scheme provides one year free pre-school to all children (15 hours per week) in the year preceding school start.*** Additional hours paid for by parents. Small number of targeted subsidies for reduced cost care, mainly via community providers.	Similar to above.	-
Aged 4-6	-	See above	**Before school start**: as above. **After-school start**: Mixture of private providers (including services on school premises) and community services that provide after-school care for free or at reduced costs to disadvantaged communities/ groups. Low level of provision/ availability.****	Similar to above.	Infant classes start from age 4, free for all children. At age 5, the majority of children are at school for around 24 hours per week for 38 weeks per year.

Notes:

#The main focus of provision is the time of the survey i.e. 2011 when the children in the GUI study were age 3, but the text and notes give details of changes since then.

* To qualify for paid maternity leave (maternity benefit), the woman needs to (a) have been in insurable employment immediately before the first day of maternity leave and (b) satisfy certain social insurance (PRSI) contribution conditions in the period prior to giving birth. Payment rates are relatively low (Moss, 2015).

**A new directive on parental leave was implemented in Ireland in March 2013, increasing the amount of parental leave available for each child from 14 weeks to 18 weeks.

***Age range: 3 years and 2 months to 4 years and 7 months. Budget 2016 introduced a second year of free pre-school (see text for details).

****See Byrne (2016) for more details.

Similarly, the Community Childcare Subvention Scheme (CCS), introduced in 2008, provided a subsidy to parents on low incomes allowing them to access childcare at reduced rates. Again, this was only available in disadvantaged areas

through community providers; the number of places was limited and in 2012 this scheme was closed to new applicants.[9] Additional subsidised childcare places were available in both the private and community sectors, through the Training and Employment Childcare Programmes (TEC). These schemes provide childcare for some parents participating in eligible education and training courses and Community Employment schemes, and includes an after-school programme for certain categories of working parents.

In January 2010 the Early Childhood Care and Education (ECCE) scheme was introduced, which would provide one year's free pre-school to children (see Table 1.1). This scheme allowed 15 hours per week of pre-school during term-time to children in the year preceding entry to primary school.[10] Approximately 96 per cent of the GUI infant cohort accessed the free pre-school year between Waves 2 and 3 (McGinnity et al., 2015); however, at Wave 2 the GUI children were below the age threshold for attendance.[11] Although the introduction of the ECCE scheme represented a significant policy shift in Ireland, care for children under the age of three continued to be seen as the sole responsibility of parents and remained costly (Wolfe et al., 2013). The Affordable Childcare Scheme (see Box 1) represents a major policy initiative to address this issue, though was not in place when the GUI survey was conducted.

[9] The cap on new places was lifted in 2015 and in Budget 2016 the scheme made available to private providers so that places were no longer restricted solely to disadvantaged areas see Pobal.ie/News.

[10] Eligible children were those aged between three years and two months, to four years and seven months on the first day of September of the academic year preceding school entry.

[11] The ECCE scheme was extended in Budget 2016 (October, 2015) to allow a second year of free pre-school to children aged between three and five and a half years.
From September 2018 the age of eligibility will be reduced from three years to two years and eight months: the upper age limit for scheme participation remains at five years and six months.

BOX 1 THE AFFORDABLE CHILDCARE SCHEME

The Affordable Childcare Scheme was announced in October 2016 as part of Budget 2017. This Scheme will have both universal and targeted elements and is currently being developed. As an interim step, in September 2017 a universal subsidy was introduced for all children aged between 6 months and 3 years who are availing of registered childcare.[12] There was also a 50 per cent increase in targeted subsidies for children whose parents have passed a means/income test for a Medical Card, GP visit card or social welfare payment. The Affordable Childcare Scheme itself will replace the existing targeted schemes by a new single scheme, which will be based on parental income and will be available to children aged between 6 months and 15 years. Depending on whether parents are engaged in formal work or study, the subsidy will be paid up to a maximum of 40 hours per week.[13] Along with streamlining existing targeted schemes, the aims of the Affordable Childcare Scheme are to promote a reduction in child poverty; enable positive child development outcomes; encourage labour market activation and lead to improved quality in the childcare sector (DCYA, 2016). Recent OECD estimates suggest that the scheme will substantially reduce childcare costs as a proportion of family income for some families in Ireland (OECD, 2017).

1.3.2 State intervention in after-school childcare

Consistent with national statistics from the Department of Education and Skills, 72 per cent of GUI children are at school at age five (Murray et al., 2016; see Smyth, forthcoming 2018 for details on transitions to primary school). The early age of school start in Ireland is unusual in comparative perspective. In many other European countries children do not start school until age 6 or 7, and under 6s are in pre-school settings. This amounts to a partial integration of childcare services into the education system: Irish provision of early care and education could be categorised as a 'mixed' system. In fact OECD statistics on early years spending typically include spending for four- and five-year-olds in infant classes in primary school (Murray et al., 2016). Clearly this has major implications for the cost and use of childcare for these children: primary level schooling in Ireland typically

[12] Childcare providers such as crèches and childminders must be registered with Tusla (the Irish Child and Family Agency with a remit for the welfare and protection of children). Only childminders minding four children or more can register, and very few childminders are registered – for instance, only 112 childminders were registered in 2016 (Tusla, 2016).

[13] An enhanced hours subsidy will be paid to parents who qualify on income grounds and where both parents are working or studying (or one parent in the case of a one-parent family). In this case, during school holidays the State will pay the relevant subsidy rate for each hour of childcare used up to maximum of 40 hours of childcare per week. During term-time, the subsidy will be paid in respect of 40 hours of care, less the number of hours the child is in school or pre-school. Parents who qualify on income grounds and where one or both are not working or studying, will qualify for a standard hours subsidy up to a maximum of 15 hours of childcare per week.

provides almost five hours of care and education per day during term-time that is free to parents (Table 1.1.).[14]

The recent focus on the deficit of childcare services in Ireland has tended to concentrate on pre-school age children; however the lack of provision for school age children has also been noted at both a national (Barry, 2011; Byrne, 2016; IDG, 2015; DCYA, 2017) and international level (Plantenga and Remery, 2013). As with early care, the onus for after-school care of children has traditionally rested mainly with parents and mothers in particular (Barry, 2011; Byrne, 2016; Plantenga and Remery, 2013). Children attend school for 4 hours and 40 minutes per day in the first two years (junior and senior infants), then increasing by one hour to 5 hours and 40 minutes for the next six years (first class to sixth class), with most schools finishing at 2.30pm. Most school-age children are cared for at home or by relatives. In fact, in 2014 Ireland had the lowest participation rates among six- to eight-year-olds in centre-based after-school care out of 36 OECD countries.[15] Non-parental after-school care is provided though a market based system or through services targeted at disadvantaged families[16] (see Table 1.1).

In 2015 the Inter-departmental Group (IDG) on Future Investment in Early Years and School Age Care and Education was established by the Minister for Children and Youth Affairs. This group recommended that a subvented scheme for provision of childcare for all children age 1-12 years should 'wraparound' the universal ECCE provision, beginning with a targeted cohort based on income but expanding over time. They recommended that it be open to both community and private providers (IDG, 2015). These recommendations were followed up in the 2017 Budget with the announcement of the Affordable Childcare Scheme (see Box 1).

1.3.3 Regulation of childminders

Private childminders represent an important source of provision, particularly for infants, but also for older children (see Table 1.1.) (McGinnity et al., 2013; Byrne and O'Toole, 2015). The term 'childminders' in Ireland includes those working in their own home who are self-employed and may take children from multiple families, and childminders working in the child's home, who usually look after children from one family and are direct employees of the family they work for. Very few childminders in Ireland are registered. The Child Care Act 1991 exempted most childminders from regulation on the grounds that they care for

[14] In Ireland parents pay for school books, sports equipment and other items that are covered in other education systems, which leads to significant out-of-pocket expenses for parents (Barnardos, 2017).

[15] OECD Family Database; see Chart PF4.3 Out-of-school-hours care www.oecd.org/social/database.htm.

[16] For example, Byrne (2016) found that nine-year-old children whose parents were in the highest income quintile and who worked longer hours were more likely to be in after-school clubs suggesting that employment hours and cost matter. However, children of lone parents and those from families who have a high income dependency on welfare were also more likely to attend an after-school club reflecting the high level of targeted provision for disadvantaged families.

three or fewer pre-school children, or for the children of only one family (in addition to their own). Goodbody Economic Consultants estimated that nearly 50,000 young children in Ireland were cared for by about 19,000 childminders (Start Strong, 2012).[17] At the end of 2011, there were just 257 childminders notified to the HSE (a role now transferred to Tusla) and therefore subject to regulation and inspection (Start Strong, 2014); by 2016 there were 112 childminders registered with Tusla (Tusla, 2016).

1.3.4 The costs of childcare – an issue for policy

An OECD report published in 2007 just before GUI Wave 1, examined net childcare costs (after accounting for tax reductions and childcare benefits) for a set number of typical households, for example dual earner and lone parent families with two pre-school children in formal full-time care (OECD, 2007).[18] This report found that Irish childcare costs, relative to household income, were among the highest in the OECD. Couples were paying on average 30 per cent, and lone parents 52 per cent, of their net income on childcare costs compared to the OECD averages of 13 per cent and 12 per cent respectively.

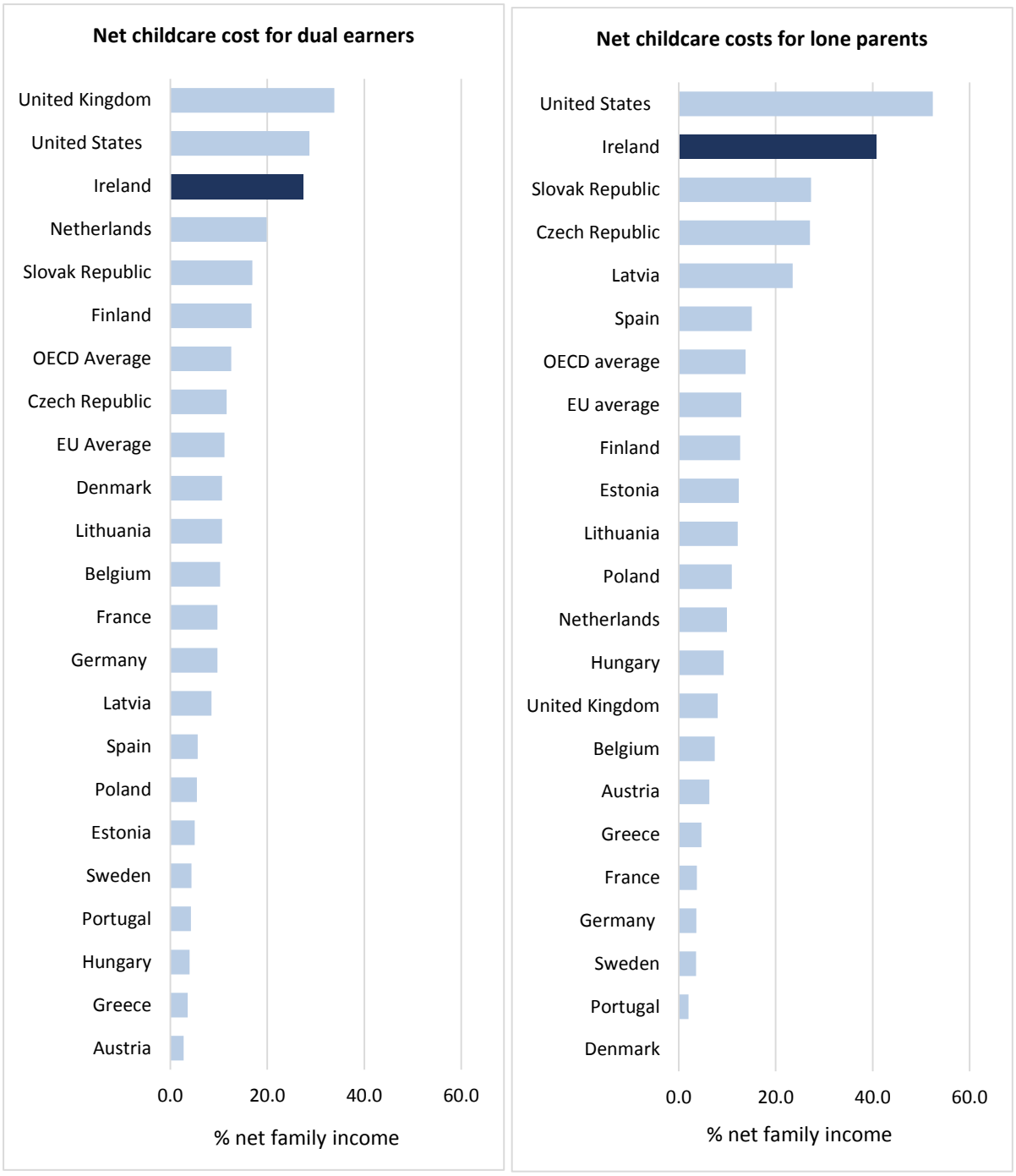
By 2012 Irish net costs had fallen only slightly to 27 per cent of net income for dual earning couples and 41 per cent for lone parents (see Figure 1.2). This puts childcare costs near the top of the OECD rankings in the year prior to Wave 3 of GUI, when study children would have been four years old.

While this was some years ago, available data on centre-based care costs suggest changes in costs to parents have been modest. The latest available data from Pobal (2017) indicate that weekly full-time fees for centre-based care, at around €165-€167 hardly changed from 2011 to 2015/2016, though rose somewhat in the most recent year (2016/2017), to an average of €174. This represents an increase of 5 per cent since 2011 (see Appendix Table A1.1). The Consumer Price Index produced by the CSO suggests that childcare prices increased by 7 per cent from 2011 to 2017 (CSO, 2018).

[17] Derived using data from the 2007 CSO QNHS Special Module on Childcare.

[18] Figures based on net costs as a proportion of 167 per cent and 67 per cent the average worker's earnings for dual earning couples and lone parents respectively. Childcare costs are the average cost for a two-year-old, for one month of full-time childcare (40 hours per week) in 2004 and earnings are based on average wage data in 2007.

FIGURE 1.2 NET COST OF FULL-TIME CHILDCARE FOR DUAL EARNER AND LONE PARENT FAMILIES AS A PROPORTION OF NET FAMILY INCOME (2012)



Source: OECD Family Database (2014) (see Charts PF3.4.B and PF3.4.C, downloaded August 2017).
Notes: Net childcare costs for a dual earner and lone parent family with two children (aged two and three) using formal care and with full-time earnings at 150 per cent and 50 per cent of the average wage respectively, 2012.

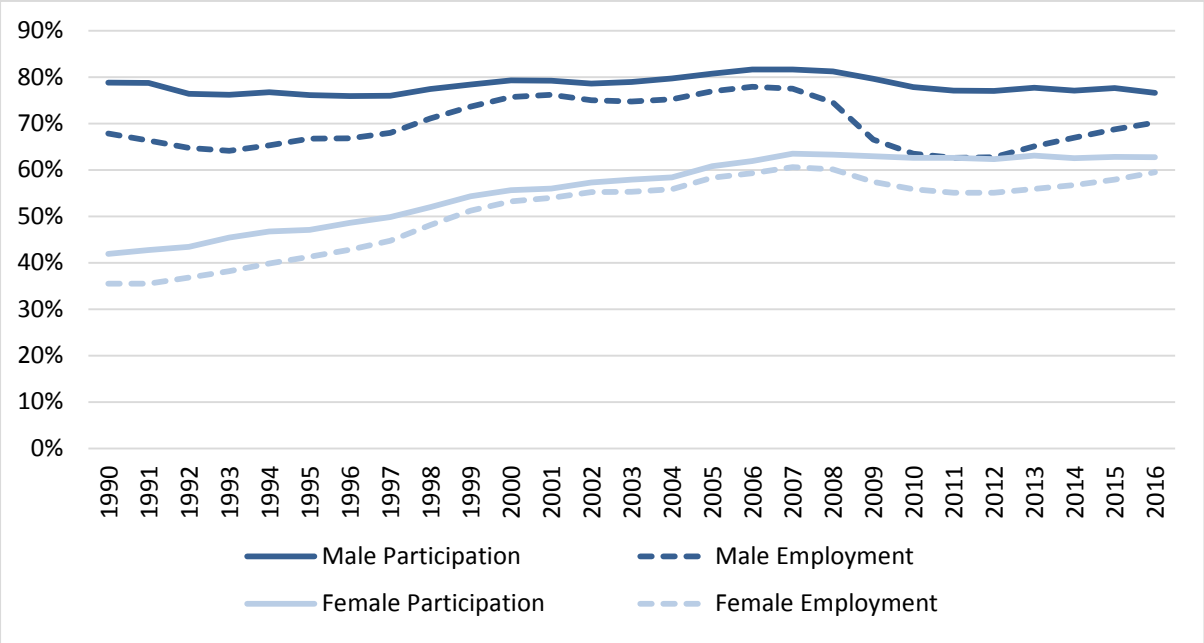
1.4 LABOUR MARKET CONTEXT: BOOM AND BUST

The availability of jobs also has a key role to play in understanding mothers' employment and their demand for non-parental childcare. The period 1994 to 2007 was a period of exceptional and sustained growth in the Irish economy and labour market. One of the most distinctive features of this labour market change

was the growth in women's paid employment (Russell et al., 2017). In 1990, the female employment rate was just over 36 per cent (see Figure 1.3), a figure well below the European average. By 2004, the employment rate of women in Ireland was 56 per cent, and had converged with the EU average. By 2008, the time of the first wave of the *Growing Up in Ireland* infant cohort, the employment rate of women in Ireland was 60 per cent.

In terms of labour market participation, mothers' responses to the economic boom varied depending on the size and age profile of their families. Among mothers of young children (under 5), participation rose from 54 per cent in 1998 to 63 per cent in 2007. The increase was more rapid for mothers of school age children (age 5 and older), whose participation rate rose from 52 per cent to 65 per cent in the same period (Russell et al., 2009).

FIGURE 1.3 LABOUR MARKET PARTICIPATION AND EMPLOYMENT RATES FOR MEN AND WOMEN IN IRELAND, 1990-2016



Source: Russell et al. (2017), using Eurostat employment rate data: table 'lfsa_ergaed'.
Note: Population aged 15 to 64 years. Participation measures the proportion of the working-age population either employed or unemployed. Employment rates are the proportion of the working-age population employed.

What kinds of jobs did women move into? Russell et al. (2009) analysed the 1996 and 2006 Censuses to look at change in occupational sub-groups. Overall, jobs for women were created across the occupational distribution. Growth was particularly marked in a number of high-skilled occupations, such as managerial/executive and business occupations, as well as in scientific and technical occupations, but also in low-skilled occupations – notably, in the context of this report, in 'personal service and childcare workers'. This is not surprising, given that a rapid rise in women's labour market participation will

create a demand for non-parental care, and, as discussed above, there was a huge capital investment in childcare places.

Following two decades of rapid economic growth, Ireland entered a severe economic and labour market crisis in 2008, the worst recession since the foundation of the State (Russell et al., 2014). The employment rate fell dramatically, and unemployment soared. The fall in employment was steepest among men, driven by the collapse in the construction sector, but employment rates and job opportunities also fell for women since the peak in 2007 (see Figure 1.3). Women in the largely public health and education sectors were somewhat protected from job losses, though there were significant wage cuts, but those working in wholesale and retail, accommodation and food and administrative and support services were vulnerable to job loss (Russell et al., 2014). The employment rate for women was 55 per cent in 2011, rising to 56 per cent in 2013 and then to back to the pre-recession rate of 60 per cent by 2016. It is well documented that female employment is also strongly influenced by the tax benefit system (Callan et al., 2012; Doorley, 2018). Changes in this policy area may therefore impact on maternal employment indirectly, via changes in this policy area (see Indecon, 2017, for example).

1.5 LITERATURE REVIEW

1.5.1 Employment transitions of mothers with young children

In all developed countries, the presence of children in the household is associated with lower participation rates and fewer maternal working hours (OECD, 2007; 2011). Younger children have a larger effect than older children: typically the distinction is between pre-school and school age children. The focus is on mothers rather than fathers, as fathers are typically not as involved in the care of children as mothers are, and in particular their labour supply is not reduced by the presence of young children. There is a growing international literature which investigates the factors that influence the employment of mothers of pre-school children, and some key findings are summarised in this section. Research which explicitly includes childcare costs when examining mothers' employment is the subject of Section 1.5.2.

Family circumstances

The available evidence suggests that the more young children a woman has, the less likely she is to work. Recent OECD statistics showed that the employment rate in 2014 for mothers in EU countries with three or more children aged 14 or under was 50.5 per cent; 20 points lower than their counterparts with one child only. In Ireland, a similar proportion of mothers with three children are in employment (51.3 per cent), but the relationship between family size and employment status is not quite as strong due to a below average employment

rate for mothers with one child only (OECD, 2016). From an employment perspective, this issue is particularly salient in Ireland, where mothers tend to have more children than in many other European countries.[19]

Indeed, most studies of childcare and female labour market participation take the presence of children as a given. In reality, in most cases parents make a deliberate choice to have (or not have) children, a choice potentially related to their job situation and policy provision, including the cost of childcare. Thus the choice between childcare and employment has been preceded by earlier choices about when to have children and how many to have. However estimating an explicit model to account for fertility choices and timing in models of employment, like Haan and Wrohlich (2011), as well as costs, would be very complicated and is beyond the scope of this report.

The financial pressure to return to work may be particularly acute for women who bear the sole financial responsibility for their children. However, caring for a small infant may be difficult to combine with paid work for mothers without a partner, particularly in the absence of reliable and affordable childcare. Patterns of return to work are very sensitive to benefit provisions for lone mothers (Pedersen et al., 2000). In Ireland participation rates of lone parents are lower than for married women, and did not rise during the economic boom (Russell et al., 2009). In fact, the participation rate of lone mothers with pre-school children actually declined during the period 1998-2007, though participation did increase for lone mothers with school-age children (youngest child aged 5-15). McGinnity et al. (2013) find that in Ireland, lone parents are somewhat more likely than married women to be working at four, five and six months, but by nine months they are much less likely to be working than mothers with partners.[20]

Another important point is that while studies and statistics often measure female employment at one point in time, women's employment is often more dynamic. Women may work part-time after childbirth, then move to full-time work, then take time out of the labour market when a second child is born. Having longitudinal data allows us to examine labour market transitions and the impact of past choices on the current situation.

Human capital

Human capital in terms of education and work history can determine the benefits from work, not only in terms of income, but also in terms of longer-term career prospects, job satisfaction and commitment (Konietzka and Kreyenfeld, 2010). Women with higher education typically return to work after childbirth more

[19] Fertility rates in Ireland have been around 2 for the past 15 years, the highest of the Eurozone countries (data.oecd.org/pop/fertility-rates.htm).

[20] At nine months one-third of lone parents were working, compared to almost half of mothers with partners.

quickly than those with lower education in the Netherlands, Germany and the UK (Cloïn et al., 2011; Drasch, 2013; La Valle et al., 2008): this is also true in Ireland (Russell et al., 2006).[21] A mother's occupation can also influence her potential earnings and likelihood of working. The costs of a break in employment in terms of career progression is likely to be higher for those in higher-level occupations, such as professional/managerial positions compared to sales or domestic cleaning (OECD, 2007).

However, some authors challenge the view that mothers with more resources return to work more quickly after childbirth: Smeaton (2006) found it is low-educated women who return early, as they are under financial pressure. Han et al. (2008), analysing US data, also found women with the lowest resources more likely to be at work within two or three months after childbirth. In Ireland McGinnity et al. (2013) found some evidence of a polarised pattern in Ireland: young mothers, lone mothers and white non-Irish mothers are somewhat more likely to return to work early, that is before the end of paid maternity leave (26 weeks, see Table 1.1) than their more advantaged counterparts. However, these groups are also less likely to be at work by nine months than other mothers.

Other factors

Research from the UK suggests that mothers' ethnicity may be associated with maternal employment though this often depends on the nature of the ethnic groups and the national context (Sylva et al., 2007). McGinnity et al. (2014) found lower maternal employment rates for most migrant groups at age three in Ireland,[22] the exception being West European mothers. Röder et al. (2017) argued that low family support for childcare and lower earnings partly explains the much lower return to work patterns of mothers from Eastern Europe in Ireland: these mothers typically have neither access to informal childcare nor can they afford market-based care.

Factors other than a woman's personal or family characteristics may influence mothers' employment. Some authors have argued that individual women's work orientation and personal preferences play a role in her choice between full-time motherhood and a combination of paid and unpaid work (Hakim, 2004). Of course as Baxter (2008) argues, women's reasons for return to work may be complex, and may include a mixture of financial and other reasons related to preferences and constraints. Motivations may also vary by educational achievement. Examining reasons for return to work using the *Growing Up in Ireland* Infant Cohort at 9 months, McGinnity et al. (2013) found that while

[21] The association between educational qualifications and return to work may be related to maternity leave provision, an issue highlighted by Waldfogel et al. (1999). McGinnity et al. (2013) find educational qualifications may play a limited role in Ireland before the end of paid maternity leave (at six months).

[22] The groups were: mothers from the UK, EU, Eastern Europe, Africa, Asia and the Rest of the World (see McGinnity et al., 2014).

almost two-thirds of mothers cited financial reasons as their main reason for returning to work, a somewhat higher proportion of women with lower qualifications cited financial reasons compared to mothers with a university degree.[23] By contrast, mothers with a university degree were more likely to say they had returned for career reasons (27 per cent) than those with a Leaving Certificate or equivalent (11 per cent).

The attitudinal climate towards women's employment can also influence behaviour (Pfau-Effinger, 2004). A significant change in attitudes to women's employment in Ireland, and particularly to the employment of mothers, is evident in the series of data from the International Social Survey Programme from 1994, 2002 and 2012. Over this time, among both women and men in Ireland, there was a clear increase in support for the employment of mothers (Russell et al., 2017). For example, in 1994, over half of all men and women felt that a pre-school child suffered if the mother works outside the home, but this had fallen to 39 per cent of men and 24 per cent of women 18 years later (Russell et al., 2017).

The availability of flexible working options and the ability to work part-time are also important factors in understanding mothers' employment. For many mothers the choice is not simply whether to work or not to work following childbirth, but whether to reduce their working hours, either in their current job, or by seeking another job which allows them to match employment with caring commitments. For example, in the UK, La Valle et al. (2008) found that 37 per cent of mothers had decreased their working hours, compared to those who worked during pregnancy. Part-time work is very common among mothers in Ireland: Russell and Banks (2011) find that in 2008, 22 per cent of employed women without children under 18 years worked part-time; the rate increased to 34 per cent for women with one child, 44 per cent for women with two children and 50 per cent of women with three or more children.

Finally, international research suggests that mothers' employment patterns may be influenced by the costs and availability of childcare. This is the topic of the next section.

1.5.2 Maternal employment and childcare costs

The presence of high quality and affordable substitutes for parental care are expected to have an impact on maternal labour supply (Cascio et al., 2015). Childcare choice may be the outcome of a sequence of decisions. Firstly, are the parents prepared to leave their child in the care of someone else? Secondly, what

[23] Mothers were asked: 'What was (is) your main reason for going back to work?' Responses were combined in into three categories: financial (including financial and job-related benefits like pension, car, etc.); career (including 'maintain a career' and 'nobody else could do the job'); and 'other' (mainly 'need an outlet outside the home' and similar responses, including multiple reasons).

type of care is available and/or acceptable? Are there relatives available who are able and willing to care for the child? What type of care is affordable? How sensitive is mothers' employment to costs? After deducting childcare costs, will it be worthwhile to work? What is the impact of childcare subsidies on mothers' employment? And of course these decisions do not always follow this sequence, and sometimes the decision to work and use childcare is simultaneous (see Figure 1.1).

A well-designed real experiment using random assignment could tell us a lot about the impact of, for example, introducing childcare subsidies, but these are expensive and can be challenging to justify.[24] Some studies (e.g. Baker et al., 2005; Berlinski and Galiani, 2004; Brewer et al., 2016; and articles in Cascio et al., 2015) exploit time and regional variation in the access and/or price of childcare, due to childcare regulations or childcare reforms, to estimate the effects of the price of childcare on maternal labour supply. Typically studies find that a reduction in costs and increased availability of childcare has positive impacts on mothers' participation and working hours (Morrissey, 2017). One problem with these difference-in-difference estimates is that regions that experienced different changes in the access or the price of childcare might not always be comparable.[25] Lundin et al. (2007) employ a strong natural experiment design, matching similar households that experienced very different reductions in price following a major childcare price reform in Sweden, but find weak effects of a reduction in childcare prices. The authors conclude this is because of the institutional setting – there were already high subsidies in place in Sweden, and high maternal employment rates. This finding is consistent with the other studies which find that introducing additional childcare supports has a limited effect on mothers' employment where mothers' participation is already very high (Cascio et al., 2015). By contrast a study examining the adoption of universal full-time pre-school for three-year-olds during the 1990s in Spain, where maternal employment was relatively low, found the change increased the labour force participation of mothers of three-year-olds by about 3 percentage points (or 10 per cent) (Nollenberger and Rodríguez-Planas, 2015). A key limitation of these kinds of studies is that they typically focus on one policy change, not the combined impact of many factors, though some studies account for the policy setting when interpreting the results of the policy change (see Cascio et al., 2015). In addition, for this type of analysis, researchers need to have data from before or after a given reform, or the change needs to be introduced in different regions at different times, and this is not always available.

An alternative approach is to use household surveys. Most econometric models using survey data in this field have attempted to estimate the elasticity (or

[24] Typically in these experiments some parents get the subsidy and some do not, which raises ethical issues.

[25] Difference-in-difference estimates attempt to mimic an experimental research design by comparing the average change over time in the outcome variable for the treatment group, i.e. those who received a childcare subsidy, compared to the average change over time for the control group, i.e. those who did not.

sensitivity) of mothers' employment conditional on wages and the price of formal childcare (Brewer and Paull, 2004). Most models use women's (hourly) wages, (hourly) childcare costs and estimate elasticities of women's labour supply.

Analysing the impact of childcare costs on mothers' employment is complicated for a number of reasons. Firstly, as noted above, childcare and mothers' employment is often a simultaneous decision. More sophisticated behavioural models, which account for parents' demand for childcare and their labour supply, can be used to predict responses to hypothetical changes. The disadvantage is that, typically, many more untestable assumptions are required, and these models are very complex. Secondly, as Heckman (1974) noted, not all parents face the same market for childcare, as some parents can use informal, low-cost or free childcare by relatives. In practice, the availability of unpaid care is often ignored, typically because of lack of information about its availability (Brewer and Paull, 2004). Thirdly, the models are often not able to take into account non-economic/preference issues because there is no information on parents' preference for childcare versus parental care, or indeed preferences about the type of care (relative versus centre-based care, for example). Fourthly, a key issue in the relationship between childcare costs and employment is that costs are not observed for those not currently using care, and wages are not predicted for those not currently working. Researchers have then tried to predict both childcare costs and wages, based on information about those for whom costs and wages are available. Predicting childcare costs often relies on finding a variable that affects childcare costs, but not mothers' employment. Here we use the region of the country in this regard.

What do the studies find? There is almost always a negative effect of higher childcare cost on mothers' employment, though the effect is not large and is sometimes insignificant. Indeed in their recent review of 36 studies, Akgunduz and Plantenga (2017) report participation elasticities from nearly -1 to close to 0, elasticity being the ratio of a percentage change in childcare price to a percentage change in maternal employment.[26] What explains such variation? The authors suggest that methodological choices and sample characteristics play a role. Typically, though not always, the employment of lone mothers is more sensitive to childcare costs than married mothers (e.g. Han and Waldfogel, 2001; Morrissey, 2017); elasticities also tend to be greater for low-income mothers than mothers with higher income (Akgunduz and Plantenga, 2017; Morrissey, 2017). Full-time employment is also more sensitive to childcare costs than part-time work (e.g. Tekin 2007). In terms of methodology, multiple choice models (for example multinomial models), which distinguish, for example, part-time work, full-time work and no work, tend to generate lower estimates of the impact of

[26] So an elasticity of participation to childcare cost of -0.25 means that a 10 per cent reduction in childcare costs would lead to an increase in participation of 2.5 per cent.

childcare costs than models with two outcomes (employment versus non-employment) (Akgunduz and Plantenga, 2017; Tekin, 2007).

Akgunduz and Plantenga (2017) also observe some patterns over time and across regions. Most of the studies are in the United States, some in Europe, Australia and Canada: on average elasticities are higher in the United States than in other countries. There has also been a decline in sensitivity of mothers' employment to childcare costs over time (see also Morrissey, 2017). The authors suggest that some of this may be due to methodological improvements, but they also suggest that at very high levels of mothers' labour market participation/employment, there is less of an effect of reducing childcare costs and/or introducing childcare subsidies. This echoes the findings of the experiment reported in Lundin et al. (2007).

1.6 CURRENT STUDY: CHILDCARE COSTS AND MATERNAL EMPLOYMENT IN IRELAND

Drawing on this previous research, we set out to formally test the effect of childcare costs on maternal employment in Ireland. While there have been econometric studies on female labour market participation (e.g. Doris, 2001; Russell et al., 2009), and microsimulation analyses of the effect of childcare costs on work incentives (Callan et al., 2012), to the best of our knowledge there are no previous statistical estimates of the effect of childcare costs on maternal labour supply in Ireland. The availability of the GUI presents us with an unprecedented opportunity to study the effect of childcare costs on employment among mothers of young children in Ireland. However, our use of child cohort data rather than household survey data imposes a number of important limitations. Firstly, the GUI data contain information on total household information but not on mothers' wages separately so we cannot estimate elasticities as is done in some of the studies outlined above. Secondly, the GUI data only record childcare costs with respect to the Study Child, not the others in the household. It is thus particularly important that we control for the presence of other children, particularly younger children, in our analyses. Thirdly, as a cohort study, the costs apply to three-year-old children specifically and not all pre-school children.

The estimation techniques used in this study exploit the fact that we have longitudinal information on women's employment. However, a number of procedures must be applied to take account of the type of data available in the survey. Firstly, in common with many of the non-experimental studies outlined above, we need to take account of the fact that not all mothers are in employment and using paid childcare. This is done by using a two-step Heckman procedure. In the first stage we model use of paid childcare (which families are most likely to use it?) to derive a selection term which we then input into the second model which estimates the impact of weekly childcare costs on hours of

work. We also correct for selection into employment, as we are concerned with those paying for childcare in order to participate in the labour market. Secondly, there is the problem of endogeneity: those with more money and higher earning power will tend to pay more for childcare, which will affect estimates of the impact of cost on hours of work. To account for this, we use an instrumental variables approach, predicting the costs of childcare using a region variable as an identifier, because it is related to childcare costs, but not mothers' hours of work (see Chapter 4 for more details of estimation techniques). These two corrections are used in models which estimate the impact of weekly costs at Wave 2 (age three) on mothers' hours of work at Wave 3 (age five).

The report proceeds as follows. In Chapter 2 we discuss the *Growing Up in Ireland* data and the measures used. In Chapter 3 we present and discuss detailed information on hourly and weekly costs to parents at age three. The chapter also considers how costs vary for different families, which parents use paid childcare at age three and who pays the most, and investigates how patterns of childcare use change when children enter after-school care at age five. Chapter 4 then investigates the factors associated with mothers' change in hours of work between age three and age five, including the impact of weekly childcare costs for the Study Child. Chapter 5 summarises the findings and reflects on their implications.

CHAPTER 2

Data and Methodology

In this chapter we outline the key features of the *Growing Up in Ireland* study and describe the variables that are used in this report, in particular how childcare costs are measured.

2.1 ABOUT *GROWING UP IN IRELAND*

The *Growing Up in Ireland* study is the national longitudinal study of children. Beginning in 2006, the survey has gathered information on two cohorts, infants and children, in repeat waves. There was an initial sample of 11,134 children for the Infant Cohort of the study. This cohort, aged nine months at the time of the first interview (Wave 1) in 2008/2009, is the focus of this report. These children were selected in a systematic random sample from the Child Benefit Register; further details are available in a separate publication (Thornton et al., 2013). The same participating children were revisited at age three years (Wave 2, January-August 2011) and again at age five years (Wave 3, March-September 2013), when the completed samples totalled 9,793 and 9,240 respectively.[27] A weight was created for the dataset such that the sample would be nationally representative of the relevant population (see Thornton et al., 2013 for further details on the creation of weights in *Growing Up in Ireland*). In this report, descriptive statistics are proportionally weighted but regression models are presented unweighted.[28]

Most information on the Study Infants was collected via a face-to-face interview with the child's Primary Caregiver in the family home. The spouse/partner of the Primary Caregiver was also interviewed if resident in the same home as the Secondary Caregiver. In almost all cases, the Primary and Secondary Caregiver were the biological mother and father respectively.

FIGURE 2.1 THE *GROWING UP IN IRELAND* INFANT COHORT

[27] The five-year sample includes a sub-sample of twins which is not included in the public access file, which contains 9,001 children.

[28] The weights in this sample are all relatively small; and the assumption is that the models will control for any factors associated with non-response. Estimating the models unweighted means no standard error correction is required.

2.2 MEASURES USED

The following sections describe the relevant data gathered in the GUI. Full, published questionnaires can be found at the following link: www.esri.ie/growing-up-in-ireland/questionnaires.

Most variables used in the analysis were collected in Wave 2, when the Study Child was three years old, including information on the Primary Caregiver (PCG) (who in 98 per cent of cases was the mother) and the Secondary Caregiver (usually the father). Here we present descriptive statistics on various different kinds of variables employed in this report.

2.2.1 Use of childcare

At each wave, Primary Caregivers were asked to provide details on non-parental care for the Study Child. At Wave 2 respondents were instructed to include only care that was used for at least eight hours per week on a regular basis. It was possible for Primary Caregivers to give information on more than one type of care, but the central classification in this report refers to the main type. *Main type of care is* broken down into five categories:

- Care by a relative in the child's home;
- Care by a relative in the relative's home;
- Care by a non-relative (childminder) in the child's home;
- Care by a non-relative (childminder) in the childminder's home;
- Centre-based care.

For simplicity, we have collapsed the two relative-based care categories into a single item.

At every wave, parents were also asked to report the hours of care for each type of care and if there was any regular non-parental care at Wave 1 (when the child was nine months old).

At age five, parents were asked different questions depending on whether or not the Study Child had started school at the time of the interview. Where the Study Child had started school, parents were asked about the usual arrangement during term-time. Again, parents were asked to identify the main type of care and to record weekly hours and costs for each care type used.

2.2.2 Childcare costs

In addition to the hours and types of care, information was collected on the 'out of pocket' cost to parents of childcare:

- **Weekly care costs**: Parents were asked to report weekly childcare costs for each care type used. If the parents paid for more than one child they were asked to calculate the average cost per child. In the following analysis we focus on weekly costs for main care. We report the costs including secondary care arrangements in the Appendix to Chapter 3.
- **Hourly Costs**: Parents were also asked how many hours per week they used each care type. Hourly costs were calculated by dividing weekly costs by hours for the main care type. Outliers were examined and hard corrections made to a very small number of cases where it was clear that the number of hours or costs were mis-stated. Hourly costs including secondary care were also calculated but are not used in the main report (see Appendix to Chapter 3).
- **Costs as a proportion of weekly disposable income**: Here we divided weekly cost by average disposable weekly income (not equivalised). Proportionate costs were top-coded at 100 per cent.

2.2.3 Socio-demographic variables

The next group of variables relates to the socio-demographic characteristics of the household. The region variable is used as an instrumental variable in Chapter 4 to establish whether childcare costs have a causal impact on maternal employment. The other socio-demographic variables are the mother's age, birthplace (Ireland or abroad), whether she lives in an urban or rural area, and her health status in Waves 2 and 3. These descriptive statistics are broadly in line with expected parameters.

TABLE 2.1 SOCIO-DEMOGRAPHIC VARIABLES – *GROWING UP IN IRELAND*

Variable	Survey Wave	Value	Per cent	N
Region	2	Border	11.4	1,120
		Dublin	25.9	2,540
		Mid-East	13.3	1,303
		Midland	6.3	614
		Mid-West	8.4	825
		South-East	10.9	1,063
		South-West	14.2	1,388
		West	9.6	939
Mother's age	2	18-24	6.3	613
		25-29	14.1	1,385
		30-34	29.0	2,843
		35-39	34.2	3,345
		40+	16.4	1,607
Born abroad	2	Yes	20.8	2,037
Urban	2	Yes	44.7	4,382
Chronic illness	2	Yes	14.8	1,449
Chronic illness	3	Yes	15.3	1,376

Source: *Growing Up in Ireland*, Infant Cohort.

2.2.4 Family/household variables

The independent variables laid out in Table 2.2 pertain to the mother's family, rather than her individual characteristics. They include the presence of family members nearby, the availability of centre-based care for her children and both the total size and changes in composition of the family between waves.

Primary Caregivers provided an exact figure or best-guess estimate of *household net income*).[29] To calculate the household's position in the income distribution, net household income was then equivalised using a standard procedure depending on the number of adults and children in the household.[30] The sample of households are then distributed equally into five groups or quintiles so that the first quintile contains the highest earning 20 per cent of households, the second quintile contains the next highest earning 20 per cent of households and so on. Compared to many other surveys, the GUI has a very high response rate on this item, with only 5.5 per cent declining to answer in Wave 2.

[29] Question wording: 'If you added up all the income sources from ALL household members what would be the total HOUSEHOLD NET income, i.e. after deductions for tax and PRSI as well as the income levy and public sector pension levy [if applicable]?' Sources include wages or salaries; income from self-employment or farming, children's allowance/child benefit, other social welfare payments; other income (incl. income from maintenance payments, investments, savings, dividends, private pensions, property); student maintenance grants.

[30] Total disposable household income is adjusted using an equivalence scale which assigns a value of 1 to the first adult, 0.66 for any additional household member aged 14 and over and 0.33 for any children under 14 (GUI RMF codebook/guidelines).

TABLE 2.2 FAMILY/HOUSEHOLD VARIABLES – *GROWING UP IN IRELAND*

Variable	Survey Wave	Value	Per cent	N
Family living nearby	1	Yes	66.0	6,459
Centre care available	1	Yes	89.1	9,931
Household Income	2	Lowest quintile	18.8	1,844
		2nd quintile	19.0	1,860
		3rd quintile	19.4	1,895
		4th quintile	18.4	1,797
		Highest quintile	19.0	1,860
		Missing	5.5	536
No. of other children in the family	2	0	40.3	3,947
		1	34.6	3,389
		2	18.2	1,785
		3	5.1	501
		4	1.1	110
		5+	0.6	61
Family status	2	Partner not employed[1]	15.2	1,486
		Partner employed	70.3	6,889
		Lone parent	14.5	1,418
New baby (Wave 2)	2	0	67.1	6,573
		1	31.5	3,086
		2+	1.4	134
New baby (Wave 3)	3	0	76.6	6,899
		1	22.5	2,025
		2+	0.8	77
Study Child at school	3	Yes	72.0	6,481

Source: *Growing Up in Ireland*, Infant Cohort.
Note: This group includes partners that are unemployed, full-time students or otherwise economically inactive.

2.2.5 Labour market variables

Finally, Table 2.3 presents summary statistics on the mother's situation regarding the labour market. The variables of interest here relate to experience; whether or not the mother has taken a break from employment, educational attainment and social class. These latter two variables capture part of the incentives mothers are faced with. All three are akin to proxies of potential wages, which may impact on maternal decisions around work.

TABLE 2.3 LABOUR MARKET VARIABLES – *GROWING UP IN IRELAND*

Variable	Survey Wave	Value	Per Cent	N
Time out of work	1	Employed Wave 1	45.8	4,482
		Out 1-10 months	21.9	2,145
		Out 11-18 months	12.7	1,244
		Out 19-24 months	1.4	138
		Out 25-60 months	7.7	758
		More than five years since last job	5.0	490
		Missing/never worked	5.5	536
Qualifications	2	Less than upper secondary	13.9	1,361
		Upper secondary	32.6	3,192
		Third level non-degree	21.3	2,080
		Degree or higher	32.2	3,144
Household social class	2	Class missing/never worked	6.0	584
		Unskilled	2.2	211
		Semi-skilled	9.5	933
		Skilled manual	16.3	1,596
		Non-manual	18.8	1,845
		Managerial and technical	33.6	3,291
		Professional	13.6	1,333

Source: *Growing Up in Ireland*, Infant Cohort.

2.3 STATISTICAL MODELLING

Two kinds of statistical models are used in this report. One is a logistic regression, which is used when the variable we are seeking to explain is binary (i.e. takes two values only). The first regression in Chapter 3, which models the use of paid childcare, is an example of a logistic regression. Here the coefficients presented are odds so a value of less than one indicates a negative relationship and a value greater than one a positive relationship between the variable of interest and the outcome variable.

The other type of model, a linear regression model, is used throughout the rest of the report. This kind of model is used when the concept we are trying to explain can be measured on a scale where differences between units on the scale are meaningful. For example, in Chapter 3 we use linear regression models to explain variation in the hourly and weekly cost of childcare. In these models the coefficients show how the characteristic in question influences the cost of childcare relative to a reference category.

Both types of models present an additional piece of information for each estimate indicating whether the result is statistically significant; that is, can we be sure that this is robust and generalisable to the whole population given the size of the groups and the distribution? This is indicated by stars in the tables. Finally,

the R-square statistic of the total model is the total variance explained, and gives a sense of how good all the information included about the children, mothers, and households in each model is at allowing us to predict the outcome variable of interest.

CHAPTER 3

Mapping Care Costs to Parents

3.1 INTRODUCTION

High childcare costs pose a disincentive to participate in the labour market and are a substantial financial burden on Irish families. However, costs vary considerably by household type, meaning that these problems are not faced by all families equally. In addition to varying by household income, region and social class, the type of care used has a large impact on costs. While much research on the topic, particularly in the United States, and indeed policy discussion has focused on centre-based care, actually a significant proportion of non-parental caring is done in home-based settings, either by relatives or by childminders (McGinnity et al., 2013; 2015). For this reason, any consideration of childcare costs needs to include the costs of care in home-based settings too, and indeed within home-based settings; who pays for care and who does not.

As the report considers both the financial burden that childcare represents for families with young children, and the link between costs and mothers' employment, this chapter presents both weekly and hourly costs. Weekly costs are more relevant for assessing the overall financial burden of childcare: hourly costs may be more likely to influence mothers' decisions to increase or decrease their work intensity.

Children and their needs change rapidly in the first five years of life: families also change too, with for example new siblings and moving house more common in families with young children. Even without new babies and house moves, childcare patterns may be complex and may be short-lived. Some families use mixed forms of childcare, matching what is available, their preferences, what they can afford and their hours of work.

This chapter sketches the use of childcare in the first five years of a child's life. Section 3.2, which focuses on the first three years, examines which type of care parents avail of, whether they pay for this care and, if so, how much. It also presents statistics on how both absolute and relative childcare costs vary for different families across the country. The discussion of costs relates to costs at age three, because the situation at nine months is covered in detail by McGinnity et al. (2013). Section 3.3 turns to multivariate modelling, and investigates the factors that influence both the use of paid childcare and the hourly and weekly costs of childcare at age three. Section 3.4 analyses data from the third wave of the GUI to consider how the type and cost of childcare provision change as

children grow older and transition to primary school. Section 3.5 summarises the chapter.

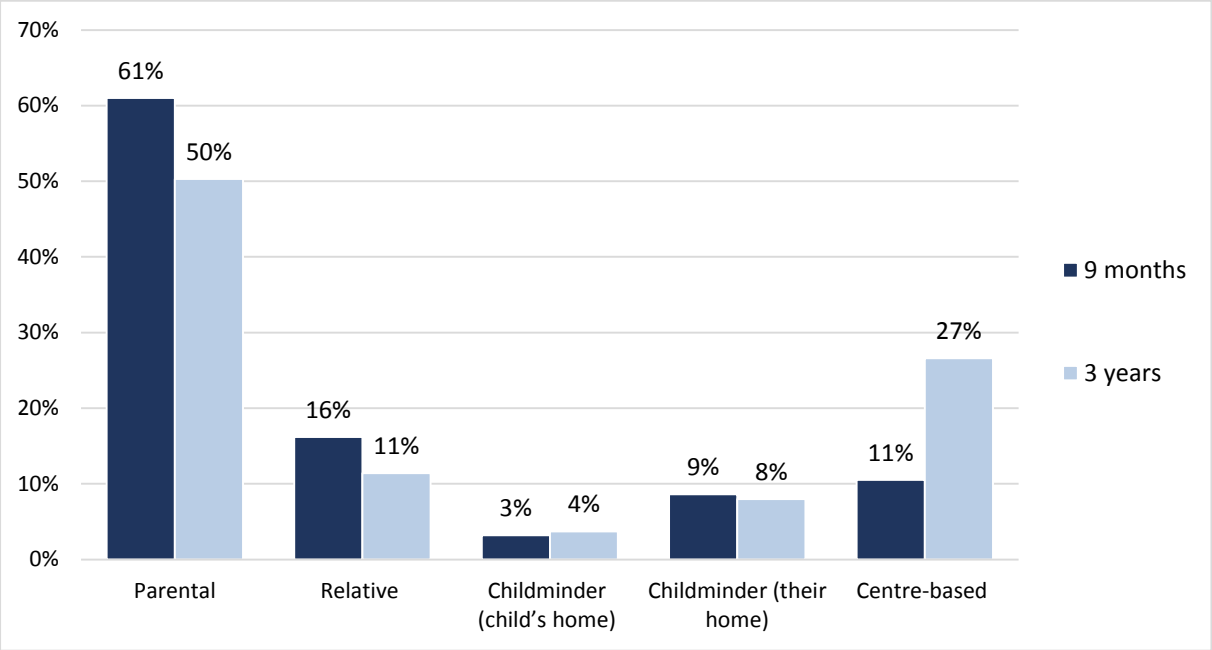
3.2 CHILDCARE STATISTICS – THE FIRST THREE YEARS

3.2.1 Use of non-parental childcare in the first three years

The use of non-parental care and the choice of childcare setting at nine months were examined in detail by McGinnity et al. (2013). Information on the situation at age three was presented in the main report on *Development from Birth to Three Years* (Williams et al., 2013), and further analysis is included in Byrne and O'Toole (2015).

Figure 3.1 presents the main type of childcare at nine months and three years old. At nine months, the Primary Caregiver (PCG) was asked if the Study Child was regularly cared for each week by someone other than themselves or the resident partner. No lower hours limit was included in the definition of regular care at nine months, but less than 10 per cent of the children in childcare received fewer than eight hours care per week (McGinnity et al., 2015). At age three, before the Free Preschool Year, the PCG was asked if the child was being cared for by someone else for at least eight hours per week.

FIGURE 3.1 MAIN TYPE OF CHILDCARE AT 9 MONTHS AND 3 YEARS



Source: *Growing Up in Ireland*, Wave 1 (2008) and Wave 2 (2011).

Figure 3.1 reveals two noteworthy changes in childcare patterns from nine months to three years. One is that the share of children in sole parental care falls substantially in this period, from 61 per cent to 50 per cent. The other is that

most of this change is due to an increase in centre-based care. Just over one-in-ten 9-month-old infants attend childcare centres, compared to 27 per cent of three-year-olds. This amounts to half of all three-year-olds that avail of some kind of non-parental care.

While Figure 3.1 focuses on main care, it is important to remember that some parents use multiple care types. Table 3.1 shows that a relatively low proportion of children, just 14 per cent, are in multiple care types at age 3. More than half of these attend a combination of centre-based care and relative care (57 per cent of those using multiple care types). Other families use a combination of centre-based care and childminders for their child (28 per cent); fewer combine relative and non-relative care (14 per cent). Parents define the main care used, and this will typically be the care type with the highest hours used: this is what is termed 'main care' in this report.

TABLE 3.1 USE OF MULTIPLE CARE TYPES AT AGE 3

Care type at three years	Per Cent	N
One care type only	85.6	4,165
Multiple care types	14.4	702
Total	100.0	4,868
Of those using multiple care types:		
Centre-based and non-relative care	28.2	198
Centre-based and relative care	56.8	399
Relative and non-relative care	14.2	100
Total	100.0	702

Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).
Note: Includes paid and unpaid care. Overall totals include small number of 'other' care type cases.

3.2.2 Hourly and weekly costs at age 3

Turning now to childcare costs for the Study Child at age 3, Table 3.2 presents the proportion of each care type that is unpaid and the mean hourly and weekly cost for parents whose children are in paid care.

Relative care accounts for just under a quarter of all non-parental care in the sample. Although unpaid care is most common in this arrangement, it is certainly not the case that relative care is always free for parents, with 45 per cent paying for it. However, the hourly and weekly costs to those who do pay for it, at €3.84 and €89.75 respectively, are well below the market rate.

Childminders (or nanny/au pair) in the child's home are the most expensive type of care. At €5.70 per hour this is more than 20 per cent more expensive than either a childminder in their home (€4.43) or centre-based care (€4.48), or indeed the overall mean hourly cost of paid childcare for three-year-olds (€4.50). The high cost for childminder care in the child's home may be because these carers

typically do not look after any children not in that family, so parents may be paying the carer a wage (McGinnity et al., 2013). Because this type of care is used so intensively, on average 28 hours per week, it also presents the highest weekly cost, almost €50 per week above the average weekly cost for all types of care.

As suggested by Figure 3.1, the first column shows that centre-based care, at 54 per cent of the total, is the dominant arrangement among three-year-olds in non-parental care. Not surprisingly, almost all of this care (97 per cent) is provided at a cost.[31] The hourly cost of centre-based care falls near the average cost of all types, but due to a lower intensity of use (only 22 hours per week on average), the average weekly cost at just over €100 is slightly below the average weekly cost for all types (€104.60).

These costs to parents are all gathered in 2011. Adjusting these costs for inflation using the Consumer Price Index (CPI) produces an estimate of average weekly costs of €112 at 2017 prices and an hourly average of €4.84. The full set of adjusted figures by care type is contained in Table A3.2.

As a robustness check, we compare the parental reports of costs for centre-based care to figures from childcare providers for the same year (Pobal, 2012). Table A3.1 in the Appendix shows that the hourly costs we find in the GUI are similar to costs charged to parents by centres.

We have also compared the GUI figures with data on childcare costs from the Special Module on Childcare in the 2016 CSO Quarterly National Household Survey. In general, there is broad agreement between the two sources – both find that childminders are the most expensive form of care, followed by centre-based care and then relative care. All QNHS figures for the hourly costs of pre-school care are within €0.35 of the equivalent (Wave 2) GUI figures.

[31] In the case of unpaid centre-based care, it could be that the parent is a crèche owner or works in the crèche, so no fees are charged. The 'childminders' category also includes friends and relatives, some of whom may not be paid.

TABLE 3.2 GUI CHILDCARE STATISTICS AT AGE 3

	Total non-parental	% Unpaid	Mean hours (paid only)	Mean hourly costs (paid only)	Mean weekly costs (paid only)
Relative	1,096 (23%)	55%	26	€3.84	€89.75
Childminder in child's home	350 (7%)	2%	28	€5.70	€153.40
Childminder in their home	765 (16%)	1%	26	€4.43	€107.20
Centre-based care	2,590 (54%)	3%	22	€4.48	€100.10
Total	4,808 (100%)	15%	24	€4.50	€104.60
N	4,808	703	4,105	4,105	4,105

Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011). Weighted.
Note: Overall totals include small number of 'other' care type cases.

Parental reports may be somewhat prone to error when there are multiple children in the household, therefore we check costs for households with only one child (N= 1,292). Table A3.3 presents childcare costs for this group. For centre-based care and care in a childminder's home, the costs are very similar to those presented in Table 3.2; this may be related to how parents are charged. For other care types, hourly costs for 'only children' are lower, though in general, the differences are not large (10-14 per cent per cent lower, see Table A3.3).[32]

An estimated 14 per cent of children attend more than one childcare arrangement per week (see Table 3.1). When we add secondary care arrangement into the figures, the mean weekly childcare hours rises to 25 hours per week, compared to 24 for main care type. The weekly cost is also higher when we include secondary care arrangements; €106.64 per week rather than €104.60. This increase is modest because the number of hours in secondary care is small and parents often use unpaid relatives or friends for supplementary care (see Appendix Table A3.3).

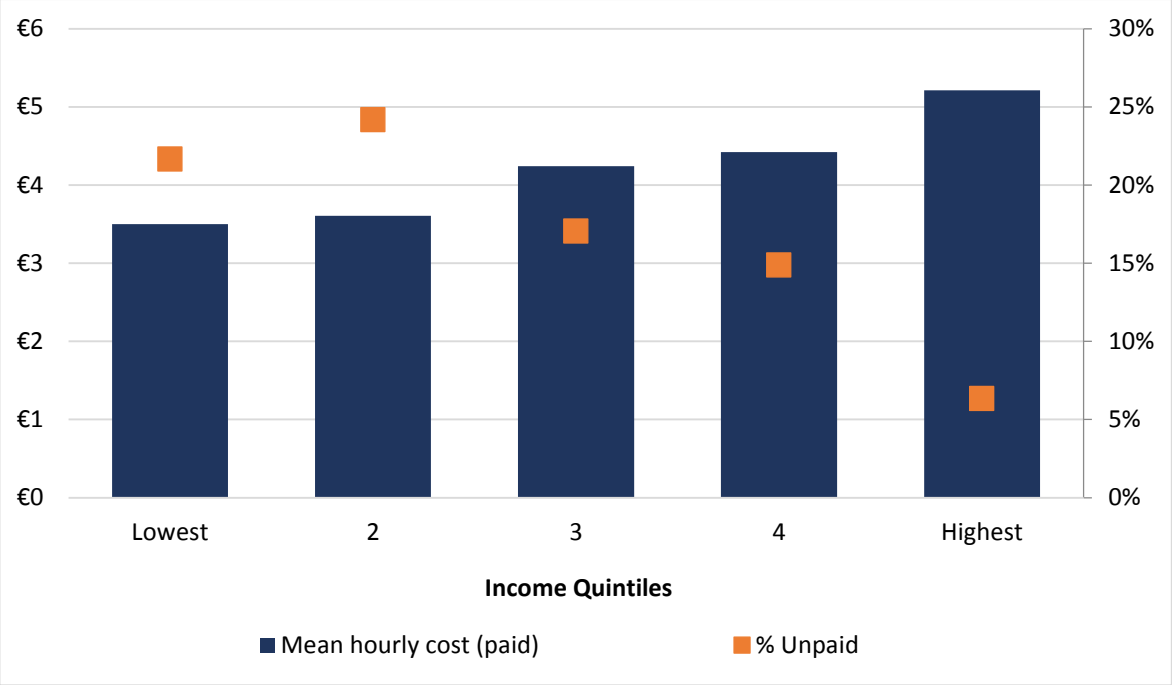
3.2.3 Costs at age 3 for different families

How do childcare costs at age 3 vary for different families? The focus here is not on type of care (relatives, childminders, or centre-based care) but rather which families pay for care, and how much they pay per hour. Figures 3.2, 3.3 and 3.4 present the mean hourly cost for families that differ by income, social class and region of residence, and the percentage of each group that avails of unpaid childcare. The analysis includes the same care types discussed above – care by relatives, childminders and other non-relatives, as well as centre-based care.

[32] It is possible that some parents do not fully adjust payment to a childminder or relative in the child's home for the fact that more than one child is covered by payment, though they are explicitly directed to take the average cost if more than one child is in the childcare arrangement (see Chapter 2), and Table A3.2 shows the differences are not large.

Figure 3.2 presents hourly costs by equivalised family income quintile. Total family income is adjusted for household size for each family and divided by five to give quintiles, where the lowest is the poorest fifth of the income distribution, and the highest the richest.

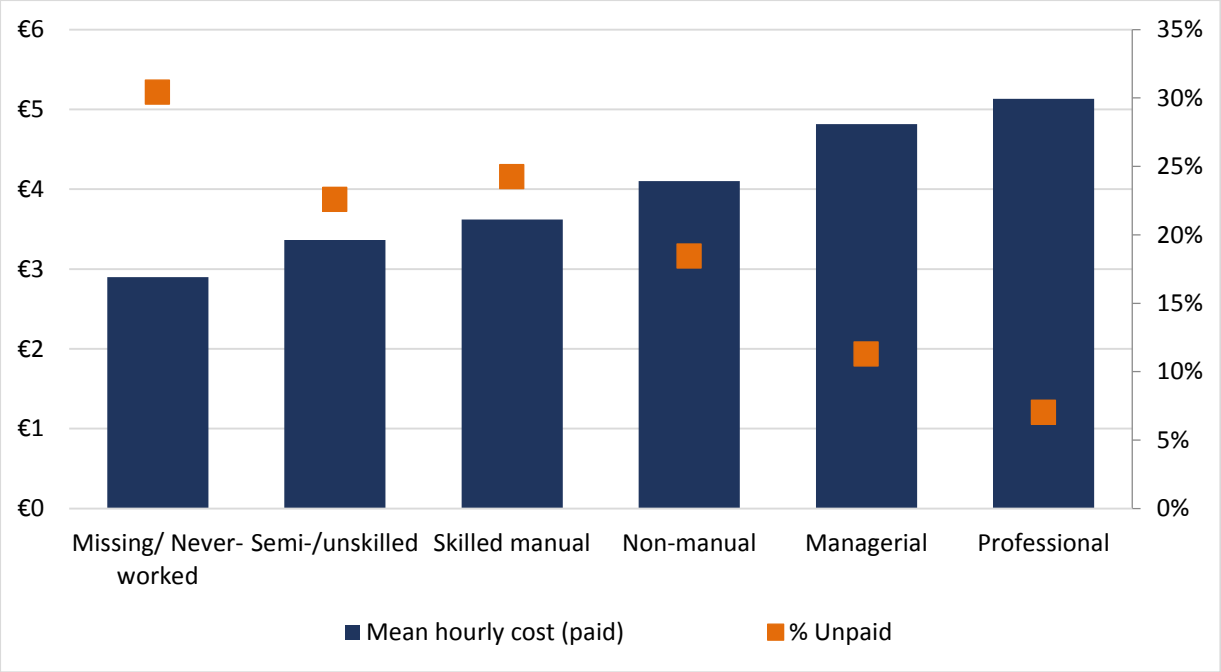
FIGURE 3.2 MEAN HOURLY CHILDCARE COST AND PERCENTAGE UNPAID FOR STUDY CHILD AT AGE 3 BY FAMILY INCOME QUINTILE



Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).

Figure 3.1 shows that hourly cost is related to income. Families in the lowest quintile pay an average of €3.50 per hour, compared to €5.20 for those in the highest quintile. A less clear pattern emerges with regard to the percentage using unpaid childcare. There is a general downward trend, with unpaid childcare becoming less prevalent as family income increases. The first quintile, however, breaks this trend. This may be due to low-income families receiving more subsidies from the State, thereby promoting the use of paid childcare.

FIGURE 3.3 MEAN HOURLY CHILDCARE COST AND PERCENTAGE UNPAID FOR STUDY CHILD AT AGE 3 BY SOCIAL CLASS



Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).

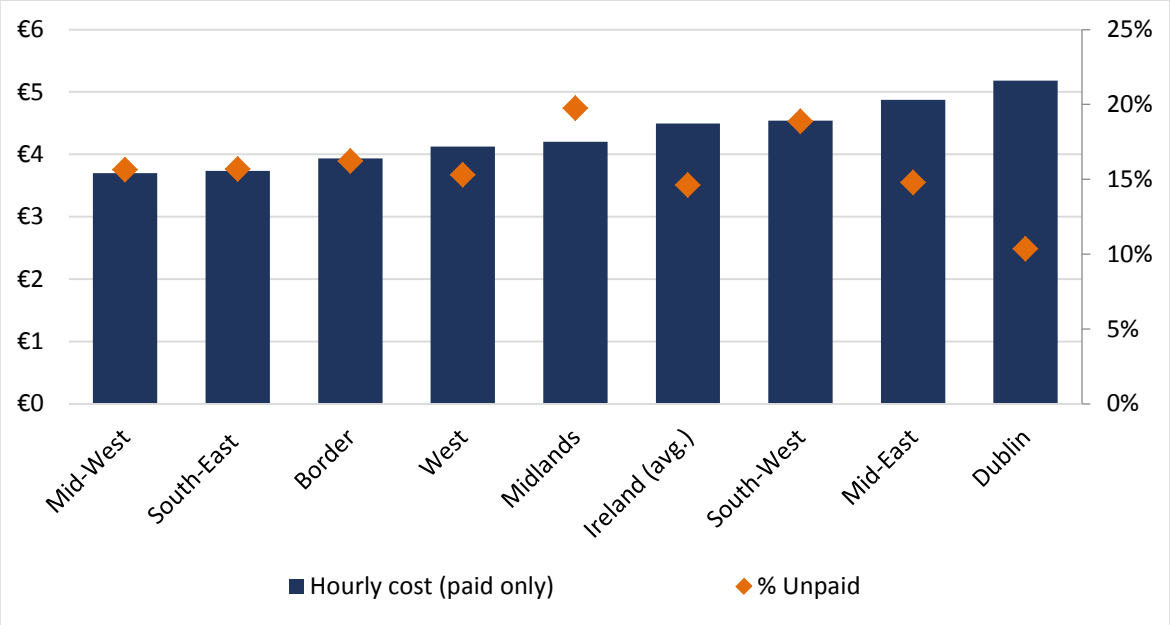
Figure 3.3 shows a similar pattern in terms of family social class. Family social class is based on occupation, and is often seen as more durable measure of resources than income.[33] Among families from professional backgrounds who pay for childcare, the hourly cost is €5 on average: this compares to €3 per hour for the small group of families who have never worked. The proportion using unpaid care (7 per cent) is also lower among professional families than the 'never worked' category (30 per cent). Excluding the 'never-worked' category, we see a pattern almost identical to Figure 3.2; the use of unpaid childcare is most concentrated in the second-lowest grouping (skilled manual), perhaps because of the effect of subsidies in the semi-skilled/unskilled category.

Another source of variation in cost to parents is where they live. Figure 3.4 presents average hourly cost and the percentage availing of unpaid care by region in Ireland. Both measures appear to be related to proximity to large urban areas. Above average costs are found in the South-West, in Dublin and in the capital's commuter belt (Mid-East). For those who pay for care, the regional range is €3.70 in the Mid-West to €5.18 in Dublin, with a national mean of €4.50. This is consistent with the pattern found for fees charged by childcare centres. In 2011 for example, urban fees were about 7-8 per cent higher than rural fees, where urban includes a large town or city and hinterland; rural is a village, small town or open countryside (Pobal, 2012).

[33] Where both parents are working the highest occupational class is used. Where neither are working the last occupational class is used. A small group have never worked, so their class is 'never worked'.

Perhaps surprisingly, at 14.8 per cent in the Mid-East and 10.4 per cent in Dublin, unpaid care is least common in the areas with the highest costs. This may be in part due to the income profile of these regions. Data from the CSO Survey of Income and Living Conditions show that in 2011, Dublin and the Mid-East had the highest median equivalised disposable income of all regions at €22,400 and €20,900 respectively – over €6,000 more per annum than the Border region (€14,703) (CSO Statbank, 2017). Another possible explanation is that mothers in Dublin, who themselves may have migrated from rural areas, may have fewer family ties nearby.

FIGURE 3.4 MEAN HOURLY CHILDCARE COST AND PERCENTAGE UNPAID FOR STUDY CHILD AT AGE 3 BY REGION



Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).

3.2.4 Childcare costs as a proportion of household income

In terms of affordability and financial burden, it is instructive to consider what portion of household disposable income is spent on childcare. For this analysis we calculate childcare costs at age three as a percentage of disposable weekly household income.[34] It is important to bear in mind that the costs are only those for the Study Child; families with more than one child in childcare could be paying multiples of the figures below.

[34] For the disposable weekly household income measure respondents are asked to include all net income, from employment, social welfare and other sources (see Chapter 2).

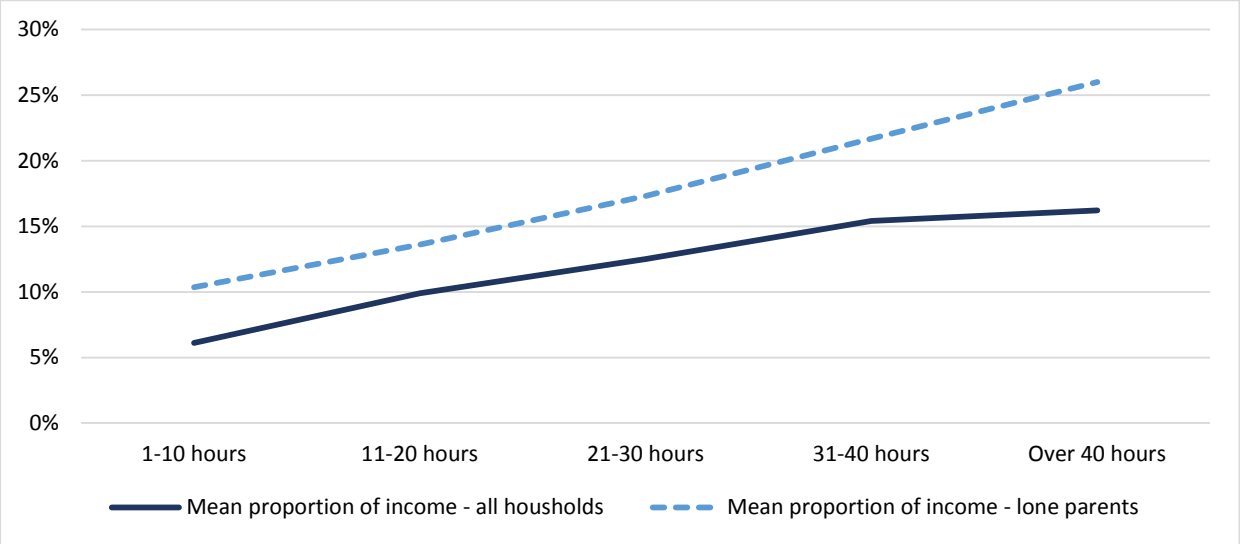
TABLE 3.3 MAIN CHILDCARE COST FOR STUDY CHILD AS A PROPORTION OF DISPOSABLE INCOME

Household type	Mean proportion of income	N
Two parent household	11%	3,435
Lone parent household	15.9%	482
Total	11.6%	3,917

Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).

The figures are calculated only for those using paid care and excludes approximately 190 cases where information on income is missing. Table 3.3 shows that, on average, parents who pay for care are spending 11.6 per cent of household income on the childcare expenses for the three-year-old child; this rises to just under 16 per cent in the case on lone parent households.[35] This is consistent with OECD (2014) estimates that net childcare costs for lone parent families are much higher than couple families.[36]

FIGURE 3.5 MAIN CHILDCARE COST FOR STUDY CHILD AS PROPORTION OF HOUSEHOLD INCOME BY CARE HOURS PER WEEK



Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).

The proportion of income spent is strongly related to the hours of care per week (see Figure 3.5). For those using up to ten hours of care per week the cost amounts to an average of 6 per cent of household income and increases to 16 per cent for those using childcare for more than 40 hours per week. The effect of lone parenthood on the proportion of income spent on childcare is roughly equivalent

[35] Table 3.3 presents proportions using the main childcare cost: the proportion of disposable income is almost identical if total care cost is used (Table A3.5).

[36] The OECD estimate of the overall proportion of net income spent on childcare by lone parents is much higher (40.6 per cent) because they account for multiple children in the household and only consider full-time care.

to paying for an extra ten hours of childcare for the entire sample. For example, lone parents who pay for 11-20 hours of childcare per week devote 13.6 per cent of their income to childcare on average. A typical family from the full sample (lone parent and two-parent families) pays a slightly lower proportion, 12.5 per cent, for 21-30 hours of childcare.

TABLE 3.4 MAIN CHILDCARE COST FOR STUDY CHILD AS PROPORTION OF HOUSEHOLD INCOME BY INCOME DECILE

Household Annual Income - Deciles Wave 2	Mean proportion of income	N
Lowest decile	19.5	165
2nd decile	15.2	193
3rd decile	12.8	240
4th decile	13.0	234
5th decile	12.4	296
6th decile	11.8	400
7th decile	10.9	463
8th decile	10.7	535
9th decile	10.9	646
Highest decile	9.3	746
Total	11.6	3,917

Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).
Note: The income deciles are based on equivalised income, which adjusts for household size and composition. For the proportion of income spent on childcare, we use net disposable weekly income with no adjustments.

The proportion of income spent on caring for the Study Child is also related to the household's position in the income distribution (see Table 3.4). Among those paying for childcare, the proportion of weekly income is highest for those in the lowest decile of income, where it represents almost 20 per cent of their household income. However, between the third and ninth deciles the proportion of income spent on childcare changes little with income, ranging from 12.8 per cent to 10.9 per cent. For households in the highest decile, for whom paid childcare is much more common, care for the Study Child represents 9.3 per cent of their weekly income.

TABLE 3.5 MAIN CHILDCARE COST FOR STUDY CHILD AS PROPORTION OF HOUSEHOLD INCOME BY SOCIAL CLASS

Social Class	Mean proportion of income	N
Missing/Never-worked	13.6%	114
Semi/unskilled	13.1%	255
Skilled manual	11.2%	293
Non-manual	12.3%	788
Managerial	11.3%	1,667
Professional	10.9%	801
Total	11.6%	3,918

Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).

In contrast to the household's position in the income distribution, social class has a muted effect on relative childcare costs. None of the categories deviates by more than two percentage points from the mean of 11.6 per cent.

3.3 WHO PAYS FOR CHILDCARE AND WHO PAYS MOST AT AGE 3?

3.3.1 Modelling the use of paid childcare at age 3

Here we explore the factors associated with the use of paid childcare using a logistic regression model. The results presented are odds ratios so that values of less than 1 mean that the group is less likely to use paid childcare than the reference group (the reference group for each variable is highlighted in the table). Values greater than 1 mean that the group in question is more likely to use childcare than the reference group.

Compared to those with less than Leaving Certificate qualifications, mothers with degree-level qualifications or higher are more likely to use paid childcare. As income and working hours are already controlled for in the model this may indicate a preference for more formal arrangements among highly educated mothers or a lack of availability of informal free care (e.g. because their own parents may be older/at work/not living locally).

The use of paid care is also related to ability to pay. Those in the highest income quintile are most likely to use paid childcare. However those in the fourth income quintile are somewhat less likely to use paid care than the lowest income households. This may be due to low-income household accessing targeted subsidised childcare where a low cost is paid by the parents. In the following section we model the average costs across household types.

The strongest predictor of paid childcare use is the mother's working hours. Any involvement in employment increases the use of paid care compared to those

who are not employed. Moreover, the longer the hours worked, the more likely the use of paid care becomes. For example, mothers working 1 to 15 hours a week are 2.2 times as likely to use paid care as women who are not employed; those working 40 hours or more are almost seven times more likely to use paid childcare than the reference group.

Holding income and working hours constant, lone parents are more likely to use paid childcare than women with an employed partner. Households where the partner is not employed are much less likely to use paid childcare, because of the availability of the partner to provide care.

The presence of other children both younger and older than the Study Child reduces the likelihood of using paid childcare. Cost is likely one of the factors here.

TABLE 3.6 LOGISTIC REGRESSION MODEL OF USE OF PAID CHILDCARE AT WAVE 2

Characteristic	Categories	Odds Ratio
Qualifications Ref: Less than upper secondary	Upper secondary	0.88
	Third level non-degree	1.08
	Degree or higher	1.31**
HH Income Quintile Ref: bottom quintile	Quintile 2	0.96
	Quintile 3	1.12
	Quintile 4	1.72***
	Quintile 5	3.51***
	Quintile Missing	1.27*
Mother's working hours Ref: Not employed	1-15 hours work	2.19***
	16-29 hours work	4.54***
	30-39 hours work	5.61***
	40 plus hours work	6.78***
Family circumstances Ref: Partner employed	Lone parent	1.36***
	Partner not employed	0.49***
Other children in household	New baby Wave 2	0.89**
	No. of children aged 3-16 years at Wave 2	0.89***
Centre care available[1] Ref: Not available	Centre-based childcare available locally	1.08
Family nearby[1] Ref: No family in area	Household has family living in the area	0.86***
Constant		0.23***
Observations		9,622
Pseudo R-squared		0.221

Source: Own calculations from the GUI Infant Cohort at Age 3.
Notes: Unweighted model. *** p<0.01, ** p<0.05, * p<0.1.
[1] Measured at Wave 1 (nine months). All other variables measured at Wave 2 (age three).

Finally we investigate whether the availability of different forms of care influences the decision to use paid care. The availability of centre-based care

locally does not affect the likelihood of using paid care once other factors are controlled for. It is possible that families substitute other forms of paid care (for example a paid childminder) when childcare centres are not available.

However, having extended family living in the area has a larger impact on use of paid childcare. Parents with family living locally (around two-thirds of parents) are less likely to use paid childcare. The information on services and family living locally was collected at 9 months and therefore is an imperfect measure of availability at age 3, though it is useful nonetheless to have some measure of childcare availability.

3.3.2 Modelling the cost of childcare at age 3

Having considered which families use paid childcare, we now consider who pays most. We model both weekly and hourly costs, and present the results in Table 3.7. These models are based on only those who pay for childcare (N=4,217), and uses the log cost, as is standard practice in models of wages and income.[37] The coefficients do not correspond to actual cost (in Euro) but can be interpreted as close to a percentage change.[38] So for example, 0.18 for Dublin in Model 1 indicates that, controlling for other factors, weekly costs in Dublin are around 18 per cent higher than in the border region. Only where coefficients are statistically significant (indicated by asterisks) can we be confident that the effects would be replicated in the population.

There are significant regional differences in care costs. Controlling for other factors, families in Dublin pay 17 per cent more per hour and 18 per cent more per week than those in the Border region. Those in the Mid-East, which encompasses much of the Dublin commuter belt, pay an average of 15 per cent more per hour and 11 per cent more per week. Those in the South-East have the lowest cost paying 7 per cent less per hour and 8 per cent less per week compared to the Border region. There is also differentiation within region; parents pay less in rural areas. However, access to childcare is likely to be difficult in rural areas.

The socio-economic position of the household also influences the cost of childcare. As we saw earlier (Figure 3.3), those in managerial and professional classes pay more for childcare and this is net of hours and type of care. Similarly, those who are in the highest income group pay the highest hourly and weekly amount for childcare. This pattern will be influenced by subsidies to the lowest income group and decisions by parents to pay more for (perceived) higher quality

[37] Using log cost means that the effects of outliers (extremely high or low costs) are reduced and the distribution is rendered closer to the normal distribution.

[38] The percentage change can be calculated by using the formula $(e^d - 1)*100$, where e^d is the estimate on the fixed-term dummy (see Halvorsen and Palmquist, 1980).

care. The independent effect of maternal educational attainment, net of hours of childcare, household class and income, suggests that the amount spent on childcare may be more influenced by mothers' earnings than total household resources. This would be consistent with qualitative findings that in household employment decisions childcare costs are calculated relative to female earnings rather than the total income (Morris, 1990).

TABLE 3.7 OLS REGRESSION MODEL OF CHILDCARE COSTS AT WAVE 2 (PAID CARE ONLY)

		Model 1	Model 2
	Variables	Log hourly cost	Log weekly cost
Region Ref: Border	Dublin	0.17***	0.18***
	Mid-East	0.14***	0.11***
	Midland	0.04	0.02
	Mid-West	-0.11***	-0.04
	South-East	-0.07***	-0.08**
	South-West	0.09***	-0.01
	West	0.01	0.04
Ref: Urban	Rural	-0.05***	-0.09***
Household class Ref: Semi/unskilled	Skilled manual	0.06	-0.03
	Non-manual	0.11***	0.05
	professional	0.18***	0.16***
	managerial	0.17***	0.12***
	Class missing	-0.17***	0.02
Income quintile Ref: Bottom	Quintile 2	0.05	-0.01
	Quintile 3	0.15***	0.10***
	Quintile 4	0.18***	0.18***
	Quintile 5	0.25***	0.35***
	Quintile missing	0.20***	0.21***
Qualifications Ref: Less than upper secondary	Upper secondary	0.08**	0.10**
	Third level non-degree	0.20***	0.17***
	Degree or higher	0.20***	0.26***
Care type Ref: Relative care	Childminder in child's home	0.33***	0.36***
	Childminder (in childminder's home)	0.16***	0.13***
	Centre-based	0.17***	0.10***
Working hours Ref: No paid work	1-15 hours	0.08***	0.14***
	16-29 hours	0.04*	0.32***
	30-39 hours	-0.01	0.56***
	40 hours or more	-0.01	0.67***
Constant		0.74***	3.48***
Observations		4,216	4,217
R-squared		0.24	0.41

Source: Own calculations from the GUI Infant Cohort at Age 3.
Note: *** p<0.01, ** p<0.05, * p<0.1.

Childcare costs are also related to care type. Care by childminders in the child's home is the most expensive type of care, with this group of parents paying an average of 33 per cent more per hour or 36 per cent more per week than those paying for relative care. Centre-based care is approximately 10 per cent more expensive per week and 16 per cent more expensive per hour than relative care. The cost of care by childminders in the childminder's home, whether weekly or hourly, is very similar to the cost of centre-based care.

Finally, hourly costs are not strongly influenced by mothers' working hours; in fact mothers working shorter hours pay slightly more than those working full-time, suggesting that there is a premium for part-time or flexible childcare provision. Conversely, weekly costs are strongly related to mothers' working hours. For example, those working 40 hours or more per week spend 67 per cent more on childcare for the Study Child than those who are not in paid work but who nevertheless use paid childcare.

3.4 CHILDCARE STATISTICS AT AGE 5

3.4.1 Type and cost of after-school care at age 5

While the main focus of this chapter is care costs at age 3, this section presents some brief information on childcare costs at age 5 for those who have started school and are availing of paid after-school care services.[39] Of the five-year-old sample surveyed, 72 per cent had started school at the time of the survey. Almost two-thirds of these children (63.9 per cent) had no non-parental care arrangement.

Table 3.8 shows the prevalence and mean hourly and weekly costs of various after-school care types among study children who avail of non-parental care. The first column shows that of those who did engage in non-parental care, almost half (45 per cent) were looked after by relatives, 30 per cent by childminders and 25 per cent in centres. The relatively low numbers availing of centre-based care may be related to the greater flexibility afforded by home-based carers, or also reflect the lack of suitable and convenient after-school care provision in Ireland (see Chapter 1, also Byrne, 2016).

Seventy per cent of the after-school care provided by relatives, and small proportions of other types of care, were unpaid, meaning that the overall proportion of five-year-olds who were both in school and using paid childcare is quite low, accounting for only 1,487 of a total GUI sample of over 9,000 children.

[39] The survey questions and pattern of results differ for those who have not yet started school at age five. To avoid complexity this analysis focuses on the majority who have started school.

TABLE 3.8 GUI CHILDCARE STATISTICS AT AGE 5 FOR SCHOOL-GOING CHILDREN

	Total non-parental care	% Unpaid	Mean hours (paid only)	Mean hourly costs (paid only)	Mean weekly costs (paid only)
Relative	1,014 (45%)	70%	15	€5.90	€72.60
Childminder in child's home	262 (12%)	3%	16	€8.12	€111.86
Childminder in their home	408 (18%)	4%	12	€6.75	€74.57
Centre-based care	547 (25%)	2%	12	€5.83	€64.83
Total	2,231 (100%)	34%	13	€6.47	€72.07
N	2,231	744	1,487	1,487	1,487

Source: *Growing Up in Ireland,* Infant Cohort, Wave 3 (2013).

A few other notable findings emerge from this analysis of care at age 5. First, and not surprisingly, the overall mean hours of care has fallen from 24 hours for the three-year-olds (see Table 3.2) to 13 hours for the five-year-olds. At this age, children spend approximately 23 hours per week at school, so the combined time in education and after-school care is 36 hours on average for those that pay for after-school care. This reduction in hours brings the total weekly cost down from €104.60 to €72.07.[40] Given the reduction in the hours of care demanded by parents, this reduction is not as large we would expect, because the cost per hour of care increases substantially. Consider childminders in the child's home, for example. Even though the average weekly number of hours dropped from 28 to 16 between the survey waves, the weekly cost only fell by just over €40. This is because the hourly cost increased from €5.70 to €8.12. Across all childcare types, the mean hourly cost increased by just under €2 from €4.50 to €6.47. This may reflect parents paying a premium for flexibility in their hours of childcare, or errors in calculating the costs where there are multiple young children in the family.

The higher cost of after-school care relative to pre-school care is supported by the data from the QNHS childcare module, which also reports higher hourly costs for after-school care (see Table A3.6). However, the QNHS data refer to broader age categories, rather than just three-year-olds and five-year-olds.

3.4.2 Childcare transitions – age 3 to 5

The previous section considered participation in childcare as well as hours and costs at age five regardless of childcare arrangements at age three. Yet do children have the same arrangements at age five as at age three, or does the situation change when they go to school? Table 3.9 presents the proportion of children in each arrangement (including sole parental care) at age five according

[40] If parents are paying a fee for more than one child they are asked to calculate the average across all children. This would lead to an over-estimate of the costs where there is a pre-school child in the household.

to the childcare arrangement at age three. The GUI does not collect detailed childcare histories between waves, so we do not know when in this period any shift in childcare arrangement occurred. Nor does the survey record a switch within type that is from one crèche to another or one childminder to another. From Table 3.9 we see both stability and change in arrangements. Looking at the columns in the table, we see that 84 per cent of children in sole parental care at age three are still in sole parental care (other than school) at age five. By contrast if we consider centre-based care, 52 per cent of those in centre-based care at age three are in sole parental care at age five. Only 21 per cent of them are still in centre-based care, the remainder looked after either by a childminder or a relative. There is somewhat more stability in the home-based care options.

TABLE 3.9 CHILDCARE TRANSITIONS: AFTER-SCHOOL CHILDCARE AT AGE 5 BY CARE ARRANGEMENT AT AGE 3

		Childcare type at Age 3 years					
		Parental care	Relative Care	Child-minder	Centre-based care	Total N cases	% row total
After-school care type at Age 5 years	Parental care	84.1%	35.4%	29.8%	52.4%	3,977	63.8%
	Relative care	9.6%	55.5%	11.4%	14.1%	1,022	16.4%
	Childminder	3.8%	5.4%	48.5%	11.9%	684	11.0%
	Centre-based	2.6%	3.7%	10.3%	21.6%	555	8.9%
	Total	3,098	726	658	1,756	6,238	100.0%
	% column total	100%	100%	100%	100%		

Source: *Growing Up in Ireland,* Infant Cohort, Wave 2 (2011) and Wave 3 (2013). Excludes children that have not started school by the Wave 3 interview.

3.5 SUMMARY

This chapter maps out the use of non-parental care and the cost of such care for children in the first three years of their life. We examine both the hourly cost of care and the weekly cost, as the latter provides an insight into the burden of childcare costs. This is further explored by examining the proportion of disposable income that families spent on care for their three-year-old child. We find that, on average, families spend just under 12 per cent of their weekly disposable income on care for the Study Child when she/he is aged three. This rises to 16 per cent of income for lone parent households. This does not count the costs of care for other children in the household. The proportion of income rises as the household's position in the income distribution falls. Those in the bottom decile of equivalised income spend close to 20 per cent of their income on childcare for the Study Child, though it should be noted that few households in this decile use paid childcare at all.

The use of paid childcare is highly stratified by social class, the mother's education and the mother's employment status. The families most likely to use paid childcare are those where the mother has a university-level education, is

engaged in full-time employment and the household is in the professional or managerial social class. Household income has only a weak effect when these factors are taken into account. Family structure is also important. Families with a greater number of children are less likely to use paid care, as are those where a new baby has been born after the Study Child. Controlling for factors such as employment status and education, lone parents are more likely to use paid care than women with employed partners, as there is no resident father to share caring responsibilities. Likewise, where the father is not employed and can take on a greater share of care, the family is less likely to pay for non-parental care.

The costs of childcare are highly variable and are distinctly related to the type of childcare used. Both weekly and hourly childcare costs are highest when the childminder comes to the family home. Care by relatives is the cheapest form of care. Over half of these carers receive no payment, even though relatives provide an average of 23 hours care per week, which is very similar to the average for centre-based care (22 hours). The cost of centre-based care falls in between the cost of relatives and childminders. Even though we confine them to families where a payment is made we find that relative-based care is significantly cheaper than other care types. Controlling for other factors, centre-based care costs 16 per cent more per hour than relative care; care by childminders in the minder's home costs 17 per cent more than relative care; while care by a childminder in the child's home costs 33 per cent more than relative care per hour.

Other factors also influence the use of paid care and the cost of care, including region, household socio-economic position and mothers' working hours. Families in Dublin, East Leinster and other urban areas face the highest costs. In socio-economic terms, it is the more privileged groups that pay most for childcare per hour and per week, which suggests that higher costs partly reflect parental choices to invest more in childcare when they have greater resources. It is likely that parents see price as a signal of childcare quality although it is unclear whether this is the case as we do not have measures of quality.[41] The positive relationship between costs and indicators of economic advantage needs to be taken into account when we examine the relationship between care costs and women's employment transitions in the next chapter.

The analysis also considers hourly and weekly costs of the various childcare types at age five, and explores changes in these types and costs as the study children transition from pre-school to after-school care. While the intensity of use of care drops off when the child enters school, the potential savings of this transition are

[41] There are some parental assessments of quality of the Free Preschool Year in the *Growing Up in Ireland* data but there is some evidence that parents may be poor judges of childcare quality (see McGinnity et al., 2015 for a discussion).

partly offset by higher hourly rates for after-school care, especially when a non-relative cares for the child in the child's home.

In the following chapter we focus on the employment of the mothers in the GUI study and assess the influence of these childcare costs on mothers' labour supply.

CHAPTER 4

Maternal Employment

4.1 INTRODUCTION

The conceptual model outlined in Chapter 1 highlights the central role of childcare in mothers' employment decisions, especially in the earliest years of a child's life. In this chapter we trace women's employment transitions in the first five years after childbirth. This approach has a considerable advantage over static analysis of employment rates using repeated cross-sectional data or comparison of employment levels among women with different characteristics. Longitudinal analysis allows us to capture the dynamic nature of labour market participation. The years around childbirth are ones in which there is substantial level of movement in and out of employment, and factors that influence exits from work may differ from those that affect returns. While there has been a good deal of study on how women's employment and job quality is influenced by the presence of young children in Ireland there has been much less research on transitions, partly due to lack of longitudinal data.[42] The aim of this analysis is to consider how employment trajectories are influenced by childcare costs, as well as other factors including personal, work and family characteristics.

In Section 4.2 we describe patterns of maternal employment in the first five years after childbirth, focusing on transitions into and out of employment and changes in working hours. In Section 4.3 we examine in detail the multiple factors that influence maternal employment when the Study Child is five years old. In Section 4.4 we specifically consider the role of childcare costs in maternal employment, and investigate whether or not this effect differs by household income. The findings are summarised in Section 4.5

4.2 CHANGE IN MATERNAL EMPLOYMENT OVER TIME

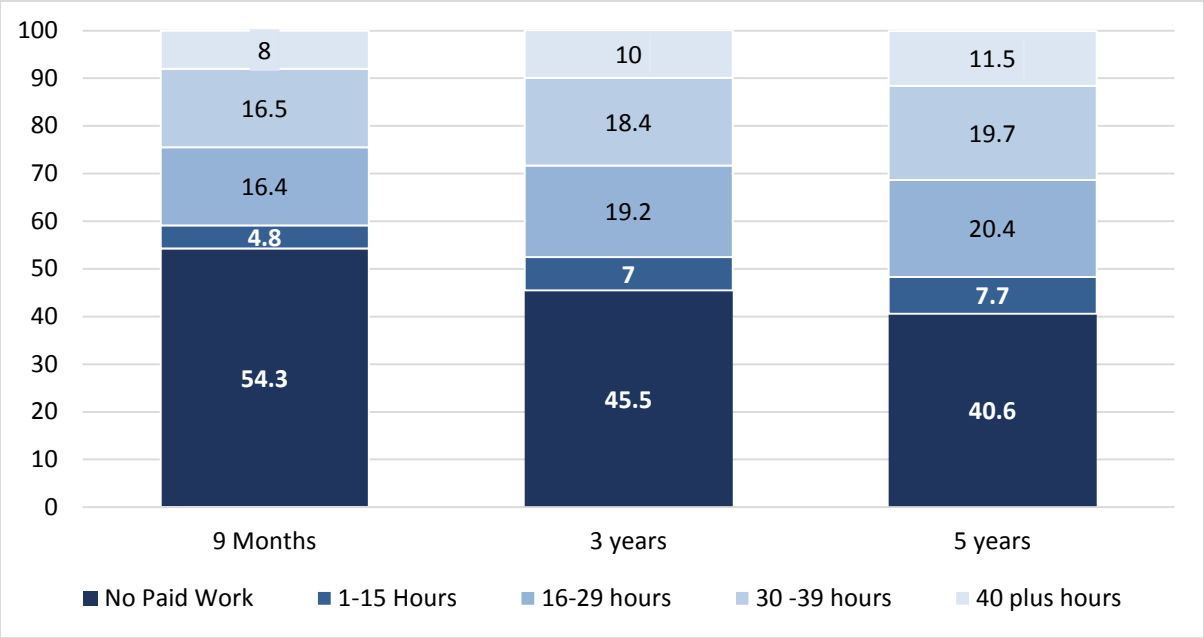
Employment trajectories for mothers are highly varied. The majority of the women were employed before the birth of the Study Child (78 per cent) but 22 per cent were not at work. This latter group includes many women for whom the Study Child was not their first child. Returns to work among the mothers in the GUI sample, during the first 9 months, were examined in detail in McGinnity et al. (2013) and by Byrne and O'Toole (2015). The timing of returns was strongly shaped by maternity leave policy, family resources, family structure (partnership

[42] Earlier research used the Living in Ireland longitudinal survey (Russell et al., 2009). The national survey of pregnancy at work also allowed analysis of women's transitions back to work in the first two years after childbirth (Russell et al., 2011).

status, age and number of other children), and the mothers' characteristics (age, education level, previous occupation, ethnicity). By the time the Study Child was nine months old, 46 per cent of mothers were in paid work (see Figure 4.1).[43] These mothers were somewhat more likely to return to full-time work than to part-time work; one-quarter were working full-time, defined as 30 hours or more per week and 21 per cent were working part-time.

At the time of the second survey, when the Study Child was 36 months, over half (54 per cent) of mothers were in employment. The proportion working full-time increased to 28 per cent and the proportion working part-time increased to 26 per cent. By the time the Study Child turned five, just under 60 per cent of mothers were in employment: 31 per cent were employed full-time and 28 per cent part-time.

FIGURE 4.1 MOTHERS EMPLOYMENT STATUS IN THE FIRST FIVE YEARS AFTER BIRTH OF STUDY CHILD



Source: GUI Infant Cohort, three waves. Own analyses.

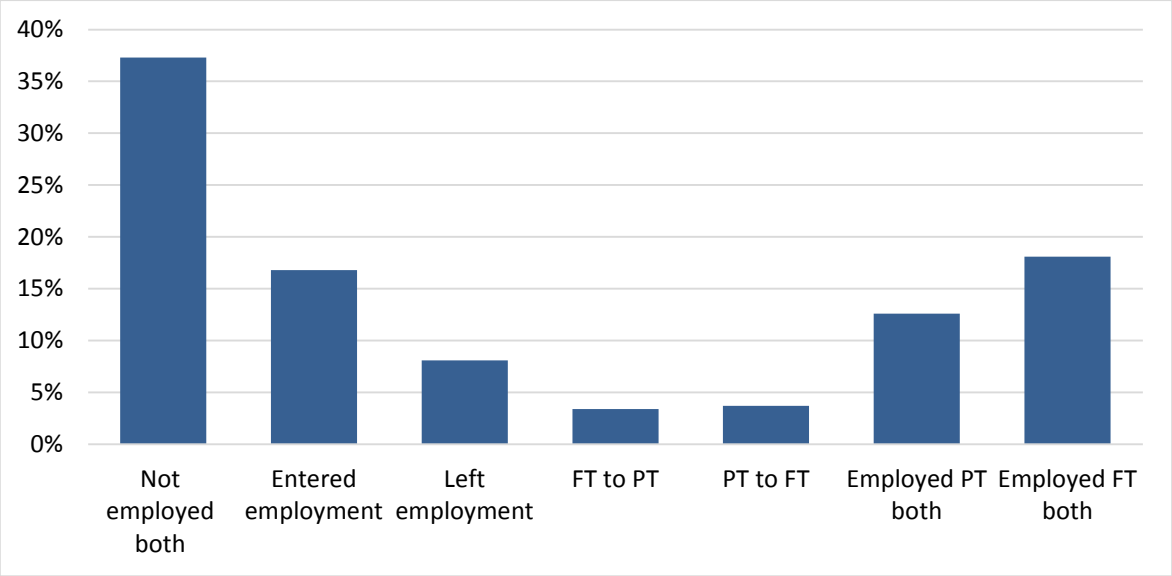
It is not necessarily the same women who are in employment at each wave of the survey. The dynamic nature of employment among women with young children is seen more clearly when we examine changes in employment status across

[43] This figure is marginally higher than the 44 per cent reported by McGinnity et al. (2013) because it includes a small proportion of women whose primary employment status was 'not employed' but who subsequently recorded that they had a part-time job.

waves.[44] In Figure 4.2 we compare the employment status of women between Wave 1 and Wave 2 of the survey.

Focusing on women who were present in the first two waves of the survey, we see that the individual trajectories confirm that the dominant trend is toward entering employment as the Study Child ages. Between the first two waves, 17 per cent of women entered employment, 8 per cent exited employment, 3.7 per cent went from part-time to full-time work, and 3.4 per cent moved from full-time to part-time work. The remainder occupied the same broad employment status at both time points: 37 per cent were not in paid work, 13 per cent were in part-time employment and 18 per cent were in full-time employment at both time points. More detailed consideration of hours would show even greater movement across the two time points but even this would not show the full complexity of transitions as short episodes of employment or non-employment between waves are not captured.

FIGURE 4.2 CHANGES IN EMPLOYMENT FROM WAVE 1 TO WAVE 2

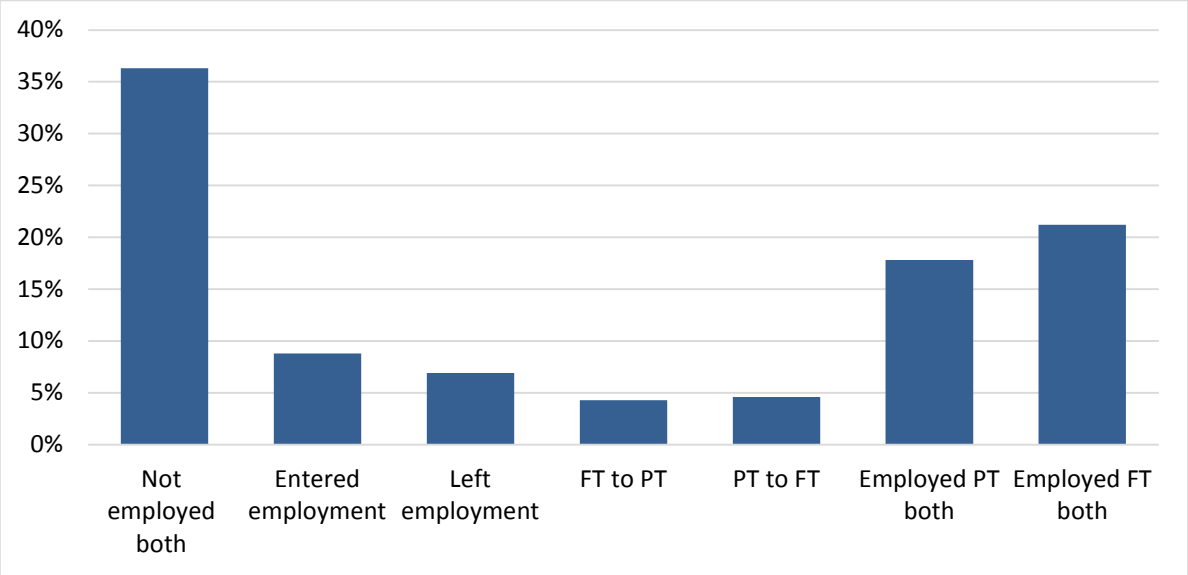


Source: Authors' analysis GUI Infant Cohort Wave 2 and Wave 3. Weighted. Only includes those present in both waves.
Note: Part-time work is defined as 0-29 hours. Full-time work is defined as greater than 30 hours.

The same calculations can be made for transitions between Wave 2 and Wave 3 of the survey, i.e. transitions between age three and five years (see Figure 4.3). Overall, 7 per cent of mothers exited employment, 9 per cent entered employment, and 9 per cent changed between working full and part-time. Again, 36 per cent of women were outside employment at both time points, while 18 per cent were in part-time employment at both points and 21 per cent were in full-time employment at both times.

[44] While the GUI data will capture most of the transitions, it is also possible that some women will have, for example, worked for a short period between survey waves.

FIGURE 4.3 CHANGES IN EMPLOYMENT FROM WAVE 2 TO WAVE 3



Source: Authors' analysis GUI Infant Cohort Wave 2 and Wave 3. Weighted. Only includes those present in both waves.
Note: Part-time work is defined as 0-29 hours. Full-time work is defined as greater than 30 hours.

Table 4.1 presents the changes in working hours between Wave 2 and Wave 3 in more detail. We see that just over half of mothers did not change their hours at all: 36 per cent had no paid work at both time points and 15 per cent were employed for the same number of hours. Just over a quarter (26 per cent) of mothers increased their hours of work, by an average of 12.6 hours. A further 22 per cent reduced their hours by an average of 13.1 hours per week.

TABLE 4.1 CHANGES IN PAID WORK HOURS BETWEEN WAVE 2 AND WAVE 3

	%	N	Mean change
Decrease	22.4	1,933	-13.1 hours
No change	51.2	4,414	–
Increase	26.4	2,282	+12.6 hours
Total	100	8,629	+0.4 hours

Source: Authors' analysis GUI Infant Cohort Wave 2 and Wave 3. Only includes those present in both waves. Weighted.
Note: To account for the possibility that some of the change over time may be due to error in the reporting of hours over waves, we re-ran this analysis with changes of less than one hour counted as no change. This resulted in the 'no change' figure changing only slightly, to 55.4 per cent.

4.3 MATERNAL EMPLOYMENT AT AGE 5

As discussed in Chapter 1, labour supply decisions are multifaceted and encompass a range of factors relating to the women's own characteristics, their family characteristics, job opportunities and conditions as well as the policy and economic environment. Childcare costs are only one factor amongst these many influences, so we control for a range of other relevant factors in the model. These are described in Table 4.2 and the measures used are detailed in Chapter 2.

TABLE 4.2 FACTORS INFLUENCING MATERNAL EMPLOYMENT

Personal characteristics	Human Capital	Family and child Characteristics	Institutional factors
Age	Educational level	No. of children	Childcare provision and cost
Migrant status	Work experience	New baby	School provision
Health		Lone parent	
		Partner's employment	

Source: Sylva et al (2007) and Pungello and Kurtz-Costes (1999).

In Table 4.3 we model the factors associated with maternal employment when the Study Child is 5 years old. The outcome measure is hours of work, and those not in employment are coded as having zero hours. The outcomes measure therefore incorporates both participation in employment and extent of hours.[45] In Model 1 we examine the effects of personal and family characteristics without controlling for previous employment experience, as many of these characteristics are also likely to have influenced earlier employment decisions.

We focus first on women's personal characteristics, their age, health and migrant status. Age is sometimes included as an indicator of potential labour market experience; however in the case of women with children this is a less straightforward measure. Given that all the women in the sample have a child born at the same time, the age variable also indicates the mother's age at the birth of the Study Child (though not necessarily age at first birth). Previous research has shown that younger mothers tend to have lower levels of education and are relatively disadvantaged in the labour market.[46] We find that hours of employment increase with age but that this effect levels off at the highest ages (indicated by the age-squared term).

Other personal characteristics included are migrant status and presence of a chronic health problem/disability. Non-Irish mothers work significantly fewer hours (-3.4 hours) than Irish nationals, which may reflect difficulties accessing the labour market including issues of language, recognition of qualifications and possible discrimination (McGinnity et al., 2013; Röder et al., 2017). Women with chronic health problems on average are employed for 3.2 hours less per week than mothers without such problems. As with the other results in the model, this

[45] As there are a significant number of observations with zero hours, in Appendix Tables A4.1 and A4.2 we separately estimate the same models for employment participation only, ignoring hours and a model of hours confined only to those in employment. The pattern of results is very similar to those presented.

[46] Various causal relationships linking education and age of childbearing have been put forward in the literature (Billari and Philipov, 2004). One is that early transitions into motherhood may interrupt educational attainment (Fletcher and Wolfe, 2008). Another is that women who pursue higher education are more likely to postpone motherhood (Kradval, 1994; Neels et al., 2017). A third explanation is that early motherhood and low levels of education are both symptoms of broader socio-economic disadvantage, though there is some empirical evidence that early motherhood impacts on employment even when controlling for other measures of disadvantage such as social class and the education of the mother's own parents (Boden et al., 2008).

consists of a greater probability of being in employment and working for longer hours per week.

Family characteristics are also important for maternal labour supply. When the Study Child is aged five, lone parents and women with partners who are not employed work significantly fewer hours than women with employed partners. The effect is larger for lone parents (-4 hours) than for women with partners who are not employed (-2.6 hours).

The number of children in the household and the birth of a new baby in the preceding two years are also strongly associated with fewer hours. Whether or not the Study Child has started school has no influence on mothers' hours of employment. A significant effect of school attendance might exist among families where the Study Child is the youngest in the family. This is an issue that could be explored further in future research.

In terms of women's characteristics, previous research has highlighted the importance of education, training and job experience, termed human capital in the economics literature. We include a measure of highest educational qualification recorded at Wave 2 (see Chapter 2 for further details). Hours of work increase significantly with each level of education. On average women with a degree supply 13.2 more hours of paid labour than women with lower than upper secondary qualifications.

TABLE 4.3 OLS REGRESSION MODELS OF HOURS OF PAID WORK AT WAVE 3

		1	2
		Personal and family	Add previous work experience
Personal characteristics	Age (years)	2.20***	0.29
	Age squared	-0.03***	-0.00
	Migrant	-3.37***	0.03
	Chronic illness at Wave 3	-3.16***	-1.50***
Family circumstances: Ref partner employed	Partner not employed	-2.59***	-0.74*
	Lone parent	-4.04***	-1.88***
Other family variables	No. children at Wave 2	-3.08***	-1.21***
	New baby at Wave 3	-3.02***	-2.99***
	Study Child in school	-0.05	-0.23
Qualifications: Ref: Less than upper secondary	Upper secondary	3.51***	0.37
	Third Level non-degree	7.72***	1.85***
	Degree or higher	13.18***	5.22***
Previous work experience	Employed Wave 2		16.65***
	Employed Wave 1		3.82***
	Employed during pregnancy		2.54***
	Constant		-19.48***
	Observations	8,661	8,661
	R-squared	0.17	0.45

Source: *Growing Up in Ireland,* Infant Cohort.
Note: **** p<0.01, ** p<0.05, * p<0.1.*

In Model 2 we add measures of previous work experience to the model. Having been in employment at the Wave 2 interview, when the Study Child was aged three, is the strongest predictor of employment hours in Wave 3 (+17 hours). Earlier employment in Wave 1, and when the woman was pregnant with the Study Child, also has an independent positive effect on maternal hours of employment when the child is aged five. As anticipated, previous work experience soaks up much of the influence of the other personal and family indicators, especially those which do not change between interviews. However, chronic illness, partner's employment, lone parenthood, the number of children in the family and having a new baby all still have a negative impact on labour supply even when employment history is taken into account. These models do not as yet estimate the influence of childcare costs on maternal employment and we turn to this question next.

4.4 ASSESSING THE EFFECT OF CHILDCARE COSTS

The relationship between employment and childcare costs are complex. If we simply correlate childcare costs and hours of employment in Wave 2 or Wave 3 we get a positive relationship. Similarly, costs are positively related to income and other indicators of social advantage. This is because women who are employed have higher childcare costs, and those who have the highest income and earning power can afford to pay more for childcare (see Chapter 3). This means that the

childcare cost, employment, and household income are not independent, and we must therefore correct for this in our models.

As in the previous section, the outcome measure for the analysis is hours in employment at Wave 3 (when the Study Child is aged five years). The outcome variable ranges from zero to 82 hours, which was the maximum number of hours recorded in Wave 3. However, this model is restricted to those who were employed and using paid childcare in Wave 2 (N=3,456). As we wish to estimate the effect of childcare costs on labour supply, we cannot include those without childcare costs; similarly those who were using paid care for purposes other than employment are not included. Women in employment and using paid childcare at Wave 2 are clearly a selective group and therefore we need to adjust the models to take account of this selectivity and to generalise the estimates to the wider population. The two selection models from which the selection terms are generated are presented in the Appendix Table A4.6.

The model for selection into paid childcare at Wave 2 includes controls for women's hours of work, family circumstances, number of children, centre-based care available locally, whether there is extended family living locally, household income and the mother's education level. These factors were shown in Chapter 3 to be associated with the use of paid childcare.

The model of selection into employment includes controls for education, lone parenthood, number of children, time out of employment in Wave 1 (when the Study Child was 9 months old), age, and chronic illness at Wave 2. We find that women's probability of being employed at Wave 2 is strongly related to the same set of personal, family and human capital factors that influence women's employment at Wave 3, though in the selection model we measure these characteristics at Wave 2. These probabilities are captured in the selection term, which we subsequently add to the model of working hours at Wave 3.

To assess the influence of childcare costs on employment we use a measure of *weekly* childcare cost as this better reflects the burden of costs than the hourly cost (see Chapter 3). We model the natural log of the weekly cost as this reduces the effects of outliers and means that the results can be interpreted as the effect of a percentage change in cost. We use the costs at Wave 2, rather than Wave 3, to reduce the autocorrelation between costs and hours of work and because shifts in hours can have occurred at any time between the two waves.[47]

[47] The costs of childcare at Wave 3 (age five) are also more difficult to measure because some of the children had started school and others had not (see Chapter 3). Models were run as a check limiting the analysis to those where the study child was in school (70 per cent) but the Ns are smaller and the instrumental variable did not pass the statistical tests. Similarly we tested models of employment at Wave 2 using childcare costs at Wave 2 as a predictor,

To further control for the endogeneity between childcare costs and employment and the confounding effect of income, we use an instrumental variables (IV) approach (Newhouse and McClellan, 1998; Gangl, 2010). The IV approach works by identifying a variable that is connected to childcare costs but is not associated with hours of work. In this case we use the region of the country as the instrumental variable because it has a direct influence on childcare costs but no independent association with hours of employment (see Appendix for test results). We can therefore use the instrumental variable in our models of maternal employment.

4.4.1 Results

Our first model (Model 3, Table 4.4), examines hours of work at Wave 3 for mothers that were employed and using paid childcare in Wave 2, without any corrections for selection or endogeneity. The effects of the personal, family and human capital characteristics closely resemble those in Model 2, Table 4.3 because previous work history is controlled by the restriction of the sample to those who were employed in Wave 2. Without any corrections, the coefficient for childcare costs is positive, because of the endogeneity problem and the selection issues outlined above.

Model 4 takes account of the fact that those in employment and paying for care at Wave 2 are selective, by adding two selection terms. Both these terms are negative indicating that the non-selected group are more likely to have much lower hours of work.[48] Most importantly for the research question, we see that controlling for selection substantially reduces the effect of (logged weekly) childcare costs at Wave 2 on employment hours at Wave 3, although the effect is still marginally positive.

Model 5 instruments childcare costs using the region of the country the family lives in as described above. Because the weekly childcare cost is logged we must divide the estimate by 100 to interpret the result. The model therefore shows that each percentage increase in childcare costs for the Study Child is associated with a reduction of 0.049 hours of paid work at Wave 3. This can also be interpreted to show that each 1 per cent decrease in childcare costs results in 0.049 hours more work. A 50 per cent decrease in weekly costs would result in 2.5 hours more work per week.

The estimate of effects of costs should be seen as conservative for two reasons. First, childcare costs are likely to have been factored into earlier employment

however we could not find an adequate instrumental variable, as region did not pass the tests of over-identification in these models.

[48] The paid childcare selection term is particularly large because it includes hours of paid work at Wave 2 as one of the predictors, which is clearly correlated with hours at Wave 3.

decisions so some of this effect is captured in the selection term. Second, the cost variable refers only to the cost for the Study Child, so the effect will be larger for parents with multiple children. Part of this effect is captured in the variable measuring the number of other children in the family.

While this estimate appears small, it should be seen in the context of other results in the analysis. Mothers who had a new baby between the two waves worked 3.6 hours less at Wave 3 compared to those without a new baby. Similarly, women with a chronic illness worked 1.7 hours less than those without a health problem (see Model 5).

TABLE 4.4 OLS REGRESSION MODEL OF HOURS OF PAID WORK AT WAVE 3

		3	4	5
			Selection Terms	IV and Selection Terms
Childcare cost Wave 2 (log weekly)		4.26***	0.87**	-4.91**
Personal characteristics	Migrant	0.24	1.03*	1.15#
	Chronic illness Wave 3	-2.50***	-1.73**	-1.67**
	Age	1.54***	-0.46	-0.38
	Age squared	-0.02***	0.01	0.01
Family Status: Ref: Partner employed	Partner not employed	1.51	4.38***	4.26***
	Lone parent	-2.35**	-1.18	-1.68#
Other family variables	No. children at Wave 2	-1.31***	0.51#	0.37
	New baby Wave 3	-2.98***	-3.32***	-3.63***
	Study Child at school Wave 3	-0.66	-0.84#	-0.66
Qualifications Ref: Less than Leaving Cert	Upper secondary	1.98	0.11	0.76
	Third level non-degree	3.67**	-1.40	-0.70
	Degree or higher	5.53***	-2.17	-1.10
Selection terms	Paid childcare Wave 2		-17.81***	-22.94***
	Employed Wave 2		-6.65***	-6.90***
	Constant	-18.63*	48.63***	74.66***
	Observations	3,152	3,115	3,115
	Adjusted R-squared	0.09	0.19	0.15

Source: *Growing Up in Ireland,* Infant Cohort.
Notes: *** p<0.01, ** p<0.05, # p<0.1. Restricted to those employed and using paid childcare in Wave 2.

4.4.2 Does the Effect of Childcare Cost Differ by Household Income?

The models so far do not include household income. To test whether childcare costs have a differential effect across income groups we run additional models that control for equivalised household income[49] at Wave 2 and then interact this with childcare costs. Focusing again on those in employment and using paid care at Wave 2 we find that all else being equal, women in high income households

[49] See Chapter 2 for measurement.

supply fewer hours at Wave 3, probably because the financial need to work longer hours is lower. In the interaction model (Appendix Table A4.8, Model 3), we test whether the effect of childcare cost differs by income level. The interaction term shows that the effect of childcare cost is reduced (becomes less negative) as household income increases. This is consistent with the expectation that the disincentive effects of childcare costs would be greater in lower income households, including lone parent households.

4.5 SUMMARY

Our analysis shows that the childcare costs have a negative influence on maternal labour supply. Our population estimate of this effect is that each percentage increase in weekly childcare costs is associated with a fall of 0.05 hours of paid work at the following wave, holding a wide range of relevant factors constant and correcting for selectivity and endogeneity.

This is likely to be a conservative estimate of the influence of childcare cost for a number of reasons. Firstly, the costs refer only to those associated with the Study Child. Additional children in the household, including new babies, are found to reduce working hours further. It is likely that some of this effect operates through the childcare costs associated with other children.

Secondly, the model is also confined to those employed and using paid childcare at Wave 2. While we include selection terms to adjust the model estimates to take account the selectivity of this group of mothers, the selection term is very likely to reflect in part the disincentive effects of childcare costs at this earlier time point. The instrumental variables approach adjusts for lack of independence between hours of paid employment and childcare costs but it is possible that some of the influence of childcare costs is already captured by the variables measuring women's employment history.

The results are limited by the fact that we only observe childcare costs at the point of each survey wave. We use childcare costs at Wave 2 to predict changes in hours of employment between Waves 2 and 3, but of course the costs of childcare will also change. We do not use childcare costs at Wave 3 as the problems of endogeneity and reverse causality become even greater. We make the assumption that the relativities in costs between GUI families found at Wave 2 will remain similar over the period (net of the changes that are controlled in the model), for example, all of the families benefit equally from the Free Preschool Year. This simplification of reality is necessary to estimate the impact of childcare costs, in the absence of any experimental or quasi-experimental data.

The results also highlight that childcare costs are only one factor in a complex, multifaceted decision about hours of work. Family characteristics, personal and

human capital factors all play an important role. The models do not include other relevant factors such as labour demand and attitudes. In addition to the constraints imposed by childcare costs illustrated here, women are also constrained by the jobs on offer. The period under consideration here (2011 to 2013), was one of high unemployment in Ireland and was also a period when rates of involuntary part-time work were significant. It cannot be assumed that, for example, exits from employment or reductions in hours were voluntary. Others may be working more hours than they would prefer, perhaps due to financial pressures. The data do not contain information on women's preferred working hours; further research on these issues would provide additional insights into this important social and economic question.

CHAPTER 5

Conclusion

5.1 CHILDCARE COST IN THE FIRST FIVE YEARS

This study examines the costs of childcare to parents in Ireland in the first five years of life. Studies by the OECD show that Ireland has relatively high costs of childcare to parents. However, while the OECD figures compare like with like across countries, they present costs only for certain 'ideal types' of households. In reality there are almost as many different childcare arrangements and costs as there are households with children. The OECD figures and information on fees charged by providers (e.g. Pobal, 2012) is restricted to formal centre-based care. The GUI study offers an excellent source to examine childcare costs for a very large representative sample of families with young children attending all forms of childcare. Information was collected about types of childcare, hours of care and costs when the children were nine months (2008), three years (2011) and five years (2013), which is not available in any other data source for Ireland. Throughout the study, costs refer to the out-of-pocket cost to parents at the time of the 2011 and 2013 survey waves. Evidence from other sources suggests that the fees charged for formal childcare showed a relatively modest increase since then at between 5 and 7 per cent (Pobal 2017; CSO Consumer Price Index). Since the timing of the surveys occurred just before and after the children attended the free pre-school year (ECCE), the costs to parents are not adjusted for this subsidy.

At three years (36 months), half of the GUI children were in non-parental care for at least eight hours a week. However, not all of this care was paid for; 15 per cent of families did not pay for the care the child received and in almost all cases this unpaid care was provided by relatives.

Our analysis focuses on paid care and includes all forms of paid care. At age three, parents used an average of 24 hours of childcare per week for the main care type, at a mean cost of €104.60 per week.[50] Costs of care were strongly linked to the type of care used. A childminder in the family's home was most expensive form of care on a weekly basis and an hourly basis, with parents paying an average of €153 per week.[51] The hourly costs of a childminder outside the home were close to those paid for centre-based care, though the mean weekly costs were somewhat higher for the former (€107) compared to the latter (€100), as weekly hours were higher for childminders outside the home.[52] Even excluding

[50] €112 at 2017 prices.
[51] €165 at 2017 prices.
[52] €115 and €118 at 2017 prices, respectively.

unpaid care, relative care was significantly lower in terms of weekly and hourly cost. Controlling for other factors, centre-based care cost 16 per cent more per hour than relative care, and a childminder outside the home cost 17 per cent more per hour. A childminder in the child's home cost 33 per cent more than relative care per hour.

The hourly costs of childcare vary across the country. Families in Dublin, the Mid-East and other urban areas face the highest costs. Households that have a higher disposable income, those in professional/managerial social class and households where the mother has higher education, pay most for childcare per hour. This suggests that higher costs partly reflect parental ability to pay more for childcare when they have greater resources. It is likely that parents see costs as a signal of childcare quality although it is unclear whether this is the case as we do not have measures of quality.

The weekly costs of childcare are influenced by the same factors, though in addition they are strongly linked to mothers' working hours. Weekly childcare costs are important as an indicator of the total burden of costs. An even better sense of the financial burden of childcare is provided by the calculation of the costs as a proportion of household income. We find that on average, families spend just under 12 per cent of their weekly disposable income on care for the Study Child when she/he is aged three. This rises to 16 per cent of income for lone parent households. The proportion of income increases as the household's position in the income distribution falls. Families in the bottom decile of equivalised income spend close to 20 per cent of their income on childcare for the Study Child, though it should be noted that few households in this decile use paid childcare.

These costs and the figures throughout the study refer only to the costs for the GUI Study Child. Where there are other young children, as in the majority of these households, the cost and the proportion of income spent will be even higher. Although we do not have the costs for other children, we do know the number and ages, and we include this information in the models of whether or not family use paid care at all, and in the models of mothers' employment.

Among children who are at school at age five, almost two-thirds of children are looked after by their parents (compared to around one-half at age three). Within the 36 per cent in non-parental care, home-based care now dominates; just over half of this group are looked after by childminders. Not surprisingly, the hours in paid childcare during term-time fall for children in school, from a mean of 24 hours per week at three years to 13 hours per week at age five years. Yet while the weekly costs for parents are lower at age five, hourly costs for those paying are actually higher; €6.50 per hour compared to €4.50 at age three. Higher hourly payments for school-age childcare compared to pre-school children are also

found using QNHS data. While ratios of children to carers are higher for this age group compared to pre-school children, making it cheaper to provide after-school care in principle, parents are clearly paying more per hour for after-school childcare than for pre-school childcare.

5.2 FACTORS INFLUENCING MATERNAL EMPLOYMENT

5.2.1 The effect of childcare

The second major issue addressed by the study is the influence of childcare costs on mothers' employment decisions. We address this question by examining the relationship between childcare costs for women in employment when the child was aged three (Wave 2) and their paid employment hours when the Study Child was aged five years (Wave 3). We use hours of paid work as the outcome as this includes participation in paid work and the intensity of this engagement. We use costs at age three because measuring hours of work and costs simultaneously creates problems of reverse causality and because exits from employment or changes to working hours can occur at any time between the interviews.

There is a considerable amount of fluidity in mothers' employment in the first five years after the birth of a child. Between Wave 1 (child aged nine months) and Wave 2 (child aged three years), 17 per cent of mothers entered employment, 8 per cent left and 7 per cent changed between full-time and part-time. Similarly between Wave 2 and Wave 3, 9 per cent entered employment, 7 per cent left and 9 per cent changed between full and part-time hours. Even this understates the level of change, because when we focus on hours almost half (49 per cent) of women recorded a change. Discussions that dichotomise women into one group comprised of full-time carers permanently outside the labour market, and another group comprised of permanently working full-time do not do justice to the range of experiences.

The positive relationship between costs and indicators of economic and social advantage found in the analysis needs to be taken into account when we examine the relationship between care costs and women's employment. If we do not do this, it would appear as if higher childcare costs lead to greater female employment. In order to do this we control for the selective characteristics of women who were in employment and paying for care in Wave 2 using two selection terms and we apply an instrumental variables approach. This requires that we have a measure related to childcare cost but not to hours of employment. We use region as the instrumental variable because it is strongly related to price but not to hours of employment.

Using these techniques we find that a 1 per cent increase in childcare costs is associated with a decrease of 0.05 employment hours per week. This implies that

a 10 per cent increase in childcare costs would be associated with working half an hour (0.5 hours) less per week. The results also show that the effect of childcare costs interacts with household income so that for households with lower income the negative effect is larger.

This is likely to be a conservative estimate of the effects of childcare costs for a number of reasons. Firstly, it applies only to the costs for the Study Child and we find that the number of other children in the household also reduces labour supply. Secondly, while the IV model adjusts for endogeneity, it is likely that some influence of childcare is also captured in other variables, particularly previous employment history, which is contained in the selection terms.

The effect size should also be interpreted in the context of the other results. The birth of a new baby is associated with a reduction of 3.6 hours and a chronic illness is associated with a reduction of 1.7 hours per week.

The size of the effect is also consistent with previous international research, which has attempted to quantify the effects of childcare costs on maternal labour supply. On average these studies find a very small negative effect of the cost of childcare on mothers' employment (see Akgunduz and Plantenga, 2017 for a review). Moreover, the studies also tend to find larger effects of childcare costs for low-income mothers (ibid, 2017).

5.2.2 Other influences on maternal labour supply

Childcare costs are only one element amongst a complex range of factors that influence maternal labour supply decisions. The GUI data provide a rich source of information about other influences and our analysis highlights their effects.

Amongst the strongest predictors of changes in women's labour supply were those relating to their skills and experiences, or 'human capital'. These are factors that strongly influence earning power, risk of unemployment and are also likely to influence commitment to employment.

Women with higher levels of education worked significantly more hours when the Study Child was aged five years; they are also significantly more likely to be employed when the child was aged three. Similarly, women with a stronger history of employment during pregnancy and the first three years of employment were working more hours when the Study Child was aged five years. These results demonstrate that prior labour market attachment is a strong predictor of future behaviour. Those with longer and more recent employment experience have higher levels of human capital, which will affect earning power.

Hours of work are also influenced by the number of children and partnership status. Lone mothers are employed for fewer hours than women with employed

partners. Having a chronic illness also reduces labour supply significantly. Older mothers are found to work somewhat longer hours than younger mothers, but this effect becomes insignificant when labour market behaviour in earlier waves is held constant. Similarly migrant status is associated with lower hours of work at five years before previous work experience is included.

There are also additional influences that are not included in our models. While the GUI data are very rich, we do not have information on women's gender role attitudes or preferences around work and care. These are likely to play an additional role on behaviour (Himmelweit and Sigala, 2004; Dex et al., 1998). Similarly while benefits are included in household income at Wave 2 when the child is three years old, we do not include controls for changes in receipt of benefits that will occur when employment status changes.

5.3 STRENGTHS, LIMITATIONS AND ISSUES FOR FURTHER RESEARCH

The GUI provides the largest nationally representative sample of families with young children in Ireland. The number of respondents far exceeds the number of households with pre-school children in any other national data source, including the QNHS or EU SILC. It therefore provides the best source of information on childcare use and costs for this age group. The GUI also collects rich information on maternal and family characteristics, including mothers' employment status, hours of work, and occupation at each survey wave. Nevertheless, as with all secondary analyses of large multi-purpose datasets, there is some information that is not collected that would have added to the analyses.

Firstly, while detailed information on childcare use and costs is collected at each survey wave, we do not have information on childcare arrangements between the waves. Similarly, we lack information on mothers' employment between the waves. Therefore, while the longitudinal nature of the data provides a distinct advantage over cross-sectional information, the extent of change in both dimensions is underestimated.

Secondly, while the GUI provides more details on different care types than most data sources there is limited information on the quality of care received. We therefore cannot establish if higher care costs are positively correlated with the quality of care.

There are also additional relevant issues that are not addressed in the study and require further research to fully understand maternal employment behaviour. Our study focuses on labour supply and does not model labour demand, for example employment opportunities and employer behaviour. The volatility of the labour market over the period of the survey data, 2008-2013, will undoubtedly

have influenced the employment patterns of mothers as it did for all other groups.

Other costs associated with employment, for example, costs of transport, are also not included. Taking up employment also has welfare implications, as cash and non-cash benefits (such as Medical Cards) are withdrawn when income rises above certain thresholds and households may become eligible for in-work supports. Modelling changes in receipt of social welfare, and the influence that this might have on employment decisions, is beyond the scope of the current analysis and is more suited to micro-simulation modelling techniques (see Callan et al., 2012). Further research using the GUI would be possible to compare the income of lone parent households or low-income households across waves and assess the net gains or losses in income for those who enter or leave employment.

A further issue for future research is the influence of childcare costs on fertility behaviour. As outlined in Chapter 1, decisions about employment and childcare are preceded by the decision to have children, and it is likely that the costs of care are factored into this decision. The GUI data could be further used to investigate the important question of whether childcare costs influence fertility behaviour in relation to subsequent births.

5.4 POLICY IMPLICATIONS

The study highlights the significant costs of childcare for pre-school children in Ireland, and the influence that this has on women's participation in paid employment. As outlined in Chapter 1, there have been significant policy developments in the childcare and early education sector over the past decade. The children in the GUI study were one of the first cohorts eligible for places under the Free Preschool Year scheme (officially the Early Childhood Care and Education scheme) and almost 96 per cent of the group availed of these places. For most of the analyses we present, the costs are measured at 36 months (in 2011) before the children took up the free pre-school year. The results therefore measure the costs before families become eligible for the scheme (the starting age has since been lowered to 32 months and the duration of the scheme has been extended to two years, see Chapter 1).

The free pre-school year is primarily an early education and care policy that is not linked to parental employment or household income. It nevertheless provides a subsidy to the parents of pre-school children and means they have to purchase fewer hours of childcare. As the scheme is universal and was taken up by such a high proportion of the families in the GUI sample, we assume that the relativities in costs between those with different characteristics remained the same over the period. Research on the impact of the ECCE scheme on mothers' employment

using a month of birth discontinuity analysis is currently underway (Keane and Logue, 2018). Similar analysis in the UK found that the introduction of a similar scheme providing 15 hours of free pre-school did not increase women's employment but the extension of the scheme to 30 hours per week did have an impact (Brewer et al., 2016).

Our analysis shows that the burden of childcare costs is particularly heavy for low income and lone parent families, amounting to between 16 and 20 per cent of household disposable income for a single child. Moreover, the disincentive effect of childcare costs on maternal labour supply decreased with household income. Research among lone parents in Ireland has highlighted childcare costs as one of the top barriers to participation in employment, education or training (e.g. Millar et al., 2012). Analyses in other contexts also show that the labour supply of lone parent and low income mothers is more sensitive to childcare costs (Akgunduz and Plantenga 2017; Morrissey, 2017) and therefore these groups are likely to be more responsive to subsidies for childcare costs. The Affordable Childcare Scheme was announced in October 2016 (see Box 1) and is designed to provide more targeted childcare cost supports for low-income families. While it is too early to assess the impact of this scheme, the principle of providing greater supports to low income families is supported by the current analysis.

Policies to address childcare costs are also important from a poverty perspective, as exclusion from the labour market due to childcare costs will increase poverty risks. A recent analysis of SILC data found that the chances of a lone parent experiencing consistent poverty fall by three-quarters when they take up employment (Indecon, 2017). Watson et al. (2012) show that even part-time maternal employment can have a substantial impact in reducing child-specific deprivation.

An increase in maternal employment hours also has a positive effect on the Exchequer through increased tax revenue (and reductions in welfare payments). Strengthening the tax and social security base is important in the light of demographic change, which research suggests will lead to fiscal stress in most European countries, including Ireland, over the next two decades (Dolls et al., 2017).

The strong relationship between employment experience and subsequent work hours suggests that supporting mothers who wish to combine paid work with caring are likely to strengthen their labour market attachment in the longer run, meaning that the labour supply returns will also accumulate over time.

While availability and cost of childcare are central for women's employment decisions, clearly other policies are also crucial for reconciling work and family life and in influencing the incentive to participate in employment.[53] These include statutory policies such as parental leave provisions and working hours regulation, and employer level policies such as access to flexible working arrangements. Tax and benefit systems also shape the relative costs and benefits of employment of parents with young children (Immervoll and Barber, 2006; Callan et al., 2012).

5.4.1 Types of childcare

The study reiterates the importance of informal childcare in the Irish system. Of those in childcare at age 3, just over half (54 per cent) were in formal centre-based care, the remaining groups were split almost evenly between care by relatives, at 22 per cent, and childminders, at 24 per cent. Informal care is even more important at age five.

The great majority of care provided outside childcare centres is not regulated or inspected. Childminders looking after fewer than four children are not required to register with the relevant government agency, Tusla, and the latest figures reported that only 112 childminders were registered (Tusla, 2016).

Under the Affordable Childcare Scheme subsidies will be paid directly to providers on the condition that they are registered centres/childminders. At present, a tiny fraction of childminders would be eligible for any subsidy. A recent working group report commissioned by the Minister for Children and Youth Affairs recommended a range of measures to bring more childminders into the scope of regulation (Working Group on Reforms and Supports for the Childminder Sector, 2018).

International analysis suggests that it is prudent to pay subsidies to providers and to make payments conditional upon reaching appropriate standards of care (Gambaro et al., 2014; OECD, 2006). Payments made For School-Going children directly to providers can also be designed to incentivise higher quality, as for example in the ECCE additional payments to centres with more highly qualified staff (McGinnity et al., 2015). General non-tied cash supports to parents as pursued in previous policies, especially in the period from the late 1990s to 2008, or tax relief to parents on childcare expenses, denies government an important leverage over supply and quality.

As childminders contribute significantly to the supply of care, effort is needed to bring this group into the regulatory system if there is not to be a significant loss in

[53] See Millar and Crosse (2016) for a review of the multifaceted range of policies that affect employment among lone parents.

care places. The costs are only one element in the care choice and therefore many parents may continue to use relatives and childminders as carers. Nevertheless, we would expect subsidies to lead to a shift especially in the case of childminders where the costs are similar to or higher than the costs of centre-based care.

REFERENCES

Akgunduz, Y.E. and J. Plantenga (2017). 'Child care prices and maternal employment: a meta-analysis', *Journal of Economic Surveys*, 32(1), pp. 118-133.

Allison, P.D. (1990). 'Change Scores as Dependent Variables in Regression Analysis', *Sociological Methodology*, 20, pp. 93-114.

Baker, M., J. Gruber and K. Milligan (2005). 'Universal Child Care, Maternal Labour Supply and Family Well-being', *Working Paper 11832*, NBER.

Barnardos (2017). *School Costs Survey 2017 Briefing Paper*. Available: www.barnardos.ie/what-we-do/campaign-and-lobby/the-issues/results-school-costs-2017.html: Accessed April 2018.

Barry, U. (2011). 'The provision of out-of-school care in Ireland', *UCD School of Social Justice Working Papers Series*, 11(2), pp 1-23.

Baxter, J. (2008). 'Is money the main reason mothers return to work after childbearing?', *Journal of Population Research*, 25(2), pp. 141-160.

Berlinski, S. and S. Galiani (2004). 'The Effect of a Large Expansion of Pre-Primary School Facilities on Preschool Attendance and Maternal Employment', *Working Paper 4/30*, The Institute for Fiscal Studies.

Billari, F.C. and D. Philipov (2004). 'Education and the Transition to Motherhood: a Comparative Analysis of Western Europe', *European Demographic Research Paper 3.*

Boden, J.M., D.M. Ferguson and L.J. Horwood (2008). 'Early Motherhood and Subsequent Life Outcomes', *The Journal of Child Psychology and Psychiatry*, Vol. 49(2), pp. 151-160.

Brewer, M. and G. Paull (2004). *Families and Children Strategic Analysis Programme (FACSAP): Reviewing approaches to understanding the link between childcare use and mothers' employment*. London: Her Majesty's Stationery Office (HMSO).

Brewer, M., S. Cattan, C. Crawford and B. Rabe (2016). 'Does free childcare help parents work?', *IFS Briefing Note BN189*.

Byrne, D. (2016). 'Determinants and Effects of School Age Childcare on Children's Cognitive and Socio-Emotional Outcomes at Age 13', *The Economic and Social Review*, 47(4), pp. 543-575.

Byrne, D. and C. O'Toole (2015). '*The Influence of Childcare Arrangements on Child Well Being from Infancy to Middle Childhood',* Dublin: TUSLA in association with Maynooth University.

Callan, T., C. Keane, M. Savage, J.R. Walsh and K. Timoney (2012). 'Work Incentives: New Evidence for Ireland', in Callan, T. (Ed.) *Budget Perspectives 2013*. Dublin: ESRI.

Cascio, E.U. (2006). 'Maternal Labor Supply and the Introduction of Kindergartens into American Public Schools', *The Journal of Human Resources*, 44 (1), pp. 140-170.

Cascio, E.U., S.J. Haider and H.S. Nielsen (2015). 'The effectiveness of policies that

promote labor force participation of women with children: A collection of national studies', *Labour Economics*, 36, pp. 64-71.

Cloïn, M. S. Keuzenkamp and J. Plantenga (2011). 'A matter of culture and cost? A comparison of the employment decisions made by mothers with a lower, intermediate and higher level of education in the Netherlands', *Work Employment and Society*, 25(3), pp. 468-486.

Connolly, S. and M. Gregory (2008). 'Moving Down: Women's Part-Time Work and Occupational Change in Britain 1991-2001', *The Economic Journal*, 118, pp. 52-76.

CPA (2005). *Ending Child Poverty: Combat Poverty Agency Policy Statement*. Dublin: Combat Poverty Agency.

CSO (2017). CSO Statbank: Population Estimates (Persons in April) (Thousand) by Sex, Age Group and Year. Table PEA01.

CSO (2018). CSO Statbank: Consumer Price Index by Detailed Sub-Indices, Month and Statistic. Table CPM16.

Department of Children and Youth Affairs (2016). 'Policy Paper on the Development of a new Single Affordable Childcare Scheme', DCYA.

Department of Children and Youth Affairs (2017). 'Action Plan on School Age Childcare', DCYA and DES: Dublin.

Department of Education and Science (2009). *Developing the workforce in the early childhood care and education sector: Background discussion paper*. Dublin: DES.

Dex, S., H. Joshi, A. McCulloch and S. Macran (1998). 'Women's employment transitions around childbearing', *Oxford Bulletin of Economics and Statistics*, 60(1), pp. 79-98.

Dolls, M., K. Doorley, A. Paulus, H. Schneider, S. Siegloch and E. Sommer (2017). 'Fiscal sustainability and demographic change: a micro-approach for 27 EU countries', *International Tax and Public Finance*, Vol. 24(4), pp. 575-615.

Doorley, K. (2018). 'Taxation, work and gender equality in Ireland', Barrington Lecture, Dublin. Available: www.ssisi.ie/Taxation_work_and_gender_equality_in_Ireland_DOORLEY.PDF (Accessed February 2018).

Doris, A. (2011). 'The Changing Responsiveness of Labour Supply during the 1990s', *Quarterly Economic Commentary*, December 2011.

Drasch, K. (2013). 'Educational Attainment and Family-Related Employment Interruptions in Germany: Do Changing Institutional Settings Matter?', *European Sociological Review*, 29(5), pp. 981-995.

EU Commission (July 2016). *Council Recommendation of 12 July 2016 on the 2016 National Reform Programme of Ireland and delivering a Council opinion on the 2016 Stability Programme of Ireland*. C 299/16.

EU Commission (May 2017). *Recommendation for a Council Recommendation on the 2017 National Reform Programme of Ireland and delivering a Council opinion on the 2017 Stability Programme of Ireland*. Com(2017) 507.

Fletcher J.M. and B.L. Wolfe (2008). 'Education and Labor Market Consequences of Teenage Childbearing: Evidence Using the Timing of Pregnancy Outcomes and Community Fixed Effects', *The Journal of Human Resources*, Vol. 44(2), pp. 303-325.

Gambaro, L., K. Stewart and J. Waldfogel (eds.) (2014). *An Equal Start? Providing quality early education and care for disadvantaged children*. Bristol: Policy Press.

Gangl, M. (2010). 'Causal Inference in Sociological Research', *Annual Review of Sociol*ogy, 36, pp. 21-47.

Haan, P. and K. Wrohlich (2011). 'Can child care policy encourage employment and fertility? Evidence from a structural model', *Labour Economics*, 18, pp. 498-512.

Hakim, C. (2004). 'Lifestyle preferences versus patriarchal values: causal and non-causal attitudes', in J.Z. Giele and E. Holst (eds.) *Changing Life Patterns in Western Industrial Societies*. Oxford: Elsevier.

Halvorsen, R. and R. Palmquist (1980). 'The Interpretation of Dummy Variables in Semilogarithmic Equations', *American Economic Review,* 70(3), pp. 474-475.

Han, W. and J. Waldfogel (2001). 'Child Care Costs and Women's Employment: A Comparison of Single and Married Mothers With Pre-School-Aged Children', *Social Science Quarterly*, 82(3), pp. 552-568.

Han, W., C.J. Ruhm, J. Waldfogel and E. Washbrook (2008). 'The timing of mothers' employment after childbirth', *Monthly Labor Review*, 131(6), pp. 15-27.

Hayes, N. (2006). *A Decade of Reflection – Childhood Care and Education in Ireland: 1996-2006*. Dublin: Centre for Social and Educational Research.

Hayes, N. and S. Bradley (2009). *Right by Children: Children's Rights and Rights Based Approaches to Policy Making in Early Childhood Education and Care: the Case of Ireland*. Irish Research Council Humanities and the Social Sciences.

Heckman, J.J. (1974). 'Effects of Child-Care Programs on Women's Work Effort', *Journal of Political Economy*, 82(2), pp. 136-163.

Himmelweit, S. and M. Sigala (2004). 'Choice and the Relationship between Identities and Behaviour for Mothers with Pre-School Children', *Journal of Social Policy*, 33(3), pp. 455-478.

IDG (2015). *Report of Inter-Departmental Working Group: Future Investment in Childcare in Ireland*. DCYA. Available (online) www.dcya.gov.ie/viewdoc.asp?fn=/documents/earlyyears/20150722IDGReportonEarlyYrsInvestmentReport.pdf.

Immervoll, H. and D. Barber (2006). *Can Parents Afford to Work? Childcare Costs, Tax-benefit Policies and Work Incentives*. Paris: OECD

Indecon (2017). *Indecon Independent Review of the Amendments to the One-parent Family Payment since January 2012*. Dublin: DEASP and Indecon.

Keane, C. and C. Logue (2018). 'The impact of free childcare policy on childcare and maternal supply decisions: Evidence from a regression discontinuity design', 6th Annual NERI Labour Market Conference, Galway.

Konietzka, D. and M. Kreyenfeld (2010). 'The growing educational divide in mothers'

employment: an investigation based on the German micro-censuses 1976-2004', *Work Employment and Society*, 24(2), pp. 260-278.

Kravdal, Ø. (1994). 'The importance of economic activity, economic potential and economic resources for the timing of first birth in Norway', *Population Studie*s 48: 249-267.

La Valle, I., E. Clery and M.C. Huerta (2008). *Maternity Rights and Mothers' Employment Decisions.* UK Department of Work and Pensions.

Lundin, D., E. Mörk and B. Öckert (2007). 'Do reduced child care prices make parents work more?', *Working Paper 2007:2.* Uppsala, Sweden: The Institute for Labour Market Policy Evaluation.

McGinnity, F., A. Murray and S. McNally (2013). *Mothers' Return to Work and Childcare Choices for Infants in Ireland*. Dublin: The Stationery Office.

McGinnity, F., E. Quinn, G. Kingston and P.J. O'Connell (2014). *Annual Monitoring Report on Integration 2013*. Dublin: ESRI.

McGinnity, F., H. Russell and A. Murray (2015). *Non-Parental Childcare and Child Cognitive Outcomes at Age 5.* Dublin: The Stationery Office.

Millar, M. and R. Crosse (2016). *Lone Parents and Activation, What Works and Why: A Review of the International Evidence in the Irish Context*. The UNESCO Child and Family Research Centre, National University of Ireland, Galway.

Millar, M., L. Coen, C. Bradley and H. Rau (2012). 'Doing the Job as a Parent: Parenting Alone, Work, and Family Policy in Ireland', *Journal of Family Issues*, Vol. 33(1), pp. 29-51.

Morris, L. (1990). *The Workings of the Household: A US-UK Comparison*. Cambridge: Polity.

Morrissey, T. W. (2017). 'Child care and parent labor force participation: a review of the research literature', *Review of Economics of the Household.* 15(1), pp. 1-24.

Moss, P. (2015). *11th International Review of Leave Policies and Related Research*. International Network on Leave Policies and Research.

Murray, A., F. McGinnity and H. Russell (2016). 'Inequalities in access to early care and education in Ireland', in J. Williams, E. Nixon, E. Smyth and D. Watson. *Cherishing all the children equally?* Dublin: Oaktree Press.

Neels, K., M. Murphy, M. Ní Bhrolcháin and E. Beaujouan (2017). 'Rising Educational Participation and the Trend to Later Childbearing', *Population and Development Review*, Vol. 43(4), pp. 667-693.

Newhouse, J.P. and M. McClellan (1998). 'Econometrics in Outcomes Research: The Use of Instrumental Variables', *Annual Review of Public Health*, 19, pp. 17-34.

Nollenberger, N. and N. Rodríguez-Planas (2015). 'Full-time universal childcare in a context of low maternal employment: Quasi-experimental evidence from Spain', *Labour Economics*, 36, pp. 124-136.

OECD (2006). *Starting Strong II: Early Childhood Education and Care*. Paris: OECD.

OECD (2007). *Babies and Bosses: Reconciling Work and Family Life. A Synthesis of*

Findings for OECD Countries. Paris: OECD.

OECD (2011). *Doing Better for Families*. Paris: OECD.

OECD (2014). *OECD Family Database Charts PF3.4.B and PF3.4.C*, Available: www.oecd.org/els/family/database.htm (Accessed August 2017).

OECD (2015). *Network on Early Childhood Education and Care (ECEC) Early Learning and Development: Common Understanding.* Paris: OECD.

OECD (2016). *OECD Family Database: LMF1.2: Maternal employment rates.* Available: www.oecd.org/els/family/database.htm (Accessed April 2018).

OECD (2017). *Faces of joblessness in Ireland: Main Results and Policy Inventory.* Available (online) www.oecd.org/els/soc/faces-of-joblessness.htm.

Pedersen, L., H. Weise, S. Jacobs and M. White (2000). *Lone Mothers' Poverty and Employment*, Oxford: Oxford University Press.

Pfau-Effinger, B. (2004). 'Socio-historical paths of the male breadwinner model – an explanation of cross-national differences', *The British Journal of Sociology*, 55(3), pp. 377-399.

Plantenga, J. and C. Remery (2013). *Childcare services for school age children: A comparative review of 33 countries*. Luxembourg: European Commission.

Pobal (2012). *Annual Survey of the Early Years Sector 2011.* Dublin: Pobal and the Department of Children and Youth Affairs.

Pobal (2015). *Annual Survey of the Early Years Sector 2014.* Dublin: Pobal and the Department of Children and Youth Affairs.

Pobal (2016). *Early Years Sector Profile 2015-2016.* Dublin: Pobal and the Department of Children and Youth Affairs.

Pobal (2017). *Early Years Sector Profile 2016-2017*. Dublin: Pobal and the Department of Children and Youth Affairs.

Pungello, E.P. and B. Kurtz-Costes (1999). 'Why and How Working Women Choose Child Care: A Review with a Focus on Infancy', *Developmental Review*, 19(1), pp. 31-96.

Röder, A., M. Ward and C.A. Frese (2017). 'From labour migrant to stay-at-home mother? Childcare and return to work among migrant mothers from the EU Accession countries in Ireland', *Work, Employment and Society*, DOI: 10.1177/0950017017713953.

Russell, H and J. Banks (2011). *Pregnancy Discrimination in the Workplace: Legal Framework and Review of Legal Decisions 1999 to 2008.* Dublin: ESRI.

Russell, H. F. McGinnity and P.J. O'Connell (2017). 'Gender equality in the Irish labour market 1966-2016: unfinished business?', *The Economic and Social Review*, 48(4), pp. 393-418.

Russell, H., B. Halpin, M. Strandh and A. Zielfe (2006). 'Comparing the Labour Market Effects of Childbirth in Ireland, Sweden, the UK and Germany', *ESRI Working Paper,* 170.

Russell, H., D. Watson and J. Banks (2011). *Pregnancy and Work: A National Survey.* Dublin: Equality Authority.

Russell, H., F. McGinnity and G. Kingston (2014). *Gender and the Quality of Work: From boom to recession.* Dublin: Equality Authority/ESRI.

Russell, H., F. McGinnity, T. Callan and C. Keane (2009). *A Woman's Place?: Female Participation in the Irish Labour Market.* Dublin: Equality Authority and ESRI.

Russell, H., O. Kenny and F. McGinnity (2016). *Childcare and socio-emotional outcomes at Age 5.* Dublin: ESRI.

Smeaton, D. (2006). 'Work return rates after childbirth in the UK – trends, determinants and implications: a comparison of cohorts born in 1958 and 1970', *Work, Employment and Society*, 20(1), pp. 5-25.

Smyth, E. (forthcoming 2018). *The Transition to Primary education: Insights from the Growing Up in Ireland Study*. Dublin: ESRI and NCCA.

Start Strong (2012). *Policy Brief: Childminding: Regulation and Recognition.* Available: www.startstrong.ie/policy-briefs (Accessed April 2018).

Start Strong (2014). *Childcare: Business or Profession.* Available: www.startstrong.ie/contents/565 (Accessed April 2018).

Sylva, K., A. Stein, P. Leach, J. Barnes, L.E. Malmberg and the FCCC-team (2007). 'Family and child factors related to the use of non-maternal infant care: An English study', *Early Childhood Research Quarterly*, 22, pp. 118-136.

Tekin, E. (2007). 'Childcare Subsidies, Wages, and Employment of Single Mothers', *The Journal of Human Resources*, 42(2), pp. 453-487.

Thornton, M., J. Williams, C. McCrory, A. Murray and A. Quail (2013). *Design, Instrumentation and Procedures for the Infant Cohort at Wave One (9 Months). Growing Up in Ireland Technical Report Number 2*. Dublin: ESRI.

Tusla (2016). *Tusla Annual Report 2016 of Tusla Child and Family Agency's Early Years Inspectorate*. Dublin: Tusla.

Waldfogel, J., Y. Higuchi and M. Abe (1999). 'Family leave policies and women's retention after childbirth: Evidence from the United States, Britain, and Japan', *Journal of Population Economics*, 12, pp. 523-545.

Watson, D., B. Maître and C.T. Whelan (2012). *Understanding Childhood Deprivation in Ireland*. Social Inclusion Report No. 2. Dublin: ESRI

Williams, J., A. Murray, C. McCrory and S. McNally (2013). *Development from birth to three years. Growing Up in Ireland, Report 5.* Dublin: The Stationery Office.

Wolfe, T., N. Hayes and B. O'Donoghue-Hynes (2013). 'Rapid Change without Transformation: The Dominance of a National Policy Paradigm over International Influences on ECEC Development in Ireland 1995-2012', *International Journal of Early Childhood*, 45(2), pp. 191-205.

Working Group on Reforms and Supports for the Childminder Sector (2018). *Pathway to a quality support and assurance system for childminding*. Volume 1: 'Summary report of the Working Group on reforms and supports for the childminding sector'.

APPENDICES

Chapter 1 Appendix

TABLE A1.1 POBAL EARLY YEARS SURVEY AVERAGE WEEKLY CHILDCARE FEES

	2011	2012	2013	2014	2015/16	2016/17
Full-time	165.64	167.27	166.63	167.19	167.03	174.16
Part-time	84.64	95.78	94.88	95.36	99.18	98.58
Sessional	58.75	66.18	65.18	65.61	66.51	68.64

Source: Pobal Early Years surveys.

Chapter 3 Appendix

TABLE A3.1 AVERAGE WEEKLY FEES FROM 2011 POBAL SURVEY OF EARLY YEARS SERVICES

	Community -Based	Private Provider	Urban	Rural	All	Per Hour*
Full-time babies	€161.34	€178.89			€173.04	
Full-time aged 1+	€156.21	€170.62	175.57	163.36	€165.54	€4.73
Part-time place	€72.56	€93.53			€84.64	€4.23
Sessional care (1 session)	€49.65	€62.53	63.64	55.44	€58.75	€3.92
Breakfast club	€21.17	€29.50			€26.66	
After-school	€49.65	€71.37			€62.76	
Drop in/Occasional	€13.23	€13.42			€13.35	

Source: Pobal 2012, Annual Survey of the Early Years Sector 2011, Table 4.1, with additional information on urban and rural costs from p.29.

Note: *Hourly costs derived, see text below.

As a check on the accuracy of the information on childcare cost provided by the Primary Caregiver, we compare the hourly rates for centre-based care to data that comes from childcare providers, namely the Pobal survey of providers. We use data for the year 2011, which was the year the three-year GUI survey was carried out. The providers report information on how much they charge for a full-time place, a part-time place or a sessional place for children of different ages. The fees are reported on a weekly basis therefore the hours were not recorded, and indeed would vary for different clients, but the following cut-off points were defined:

- Full-time = greater than five hours per day
- Part-time = 3hrs 31 mins to five hrs per day
- 1 session = less than or equal to 3.5 hrs per day

To calculate hourly costs we divided the weekly costs for full-time care by 35 hours, part-time costs by 20 hours and sessional care by 15 hours. The final column in Table A3.1 shows that the average hourly cost for children aged older than one was €4.73 for a full-time place and €4.23 for a part-time place. This compares to an average of around €4.50 for three-year-olds in the GUI data for centre-based care, which includes both full and part-time use.

TABLE A3.2 CHILDCARE COSTS ADJUSTED FOR INFLATION (2017 PRICES)

	Hourly costs CPI adjusted	Mean weekly CPI adjusted
Relative	€4.13	€96.47
Childminder in child's home	€6.13	€164.88
Childminder in their home	€4.76	€115.22
Centre-based care	€4.82	€107.59
Total	€4.84	€112.43

Source: CSO Statbank (2018) Table CPM16, Consumer Price Index by Detailed Sub-Indices, Month and Statistic.
Note: Using CSO Consumer Price Index, Childcare component.

TABLE A3.3 CHILDCARE COSTS BY CARE TYPE USED AT THREE YEARS OF AGE FOR ONLY CHILDREN (MAIN CARE)

Care type	Mean hourly cost excluding unpaid	Difference to total (Table 3.2)
Relative	€3.29	-€0.55 (-14%)
Childminder in child's home	€5.11	-€0.59 (-10%)
Childminder in their home	€4.35	-€0.08 (-2%)
Centre-based care	€4.46	-€0.02 (-<1%)
Overall	€4.28	-€0.22
N of cases	1,039	

Source: *Growing Up in Ireland*, Infant Cohort, Wave 2 (2011).
Note: Due to small sample size, the estimated cost for a childminder in the child's home may be unreliable (N<50).

TABLE A3.4 COSTS OF TOTAL CARE (MAIN AND SECONDARY CARE)

Variables	Mean Value
Weekly hours	25
Weekly Cost (paid only)	€106.64
Cost as % of income	11.8%
N	4,243

Source: *Growing Up in Ireland*, Infant Cohort, Wave 2.

TABLE A3.5 TOTAL CARE COST AS PERCENTAGE OF WEEKLY DISPOSABLE INCOME BY FAMILY TYPE

Family Type	%	N
Lone parent	16.0	521
Partner not employed	13.5	315
Partner employed	11.0	3,200
Total	11.8	4,036

Source: *Growing Up in Ireland,* Infant Cohort, Wave 2.
Note: Excludes cases where there is no payment, though not all care hours may be paid for.

TABLE A3.6 COMPARISON OF CHILDCARE COSTS: GUI AND QNHS

Mean Hourly Cost of Care (paid only)			
	GUI	QNHS	Difference (GUI-QNHS)
Pre-school	€4.50 (4,103)	€4.20 (571)	€ 0.30
After-school/primary school age	€6.47 (1,487)	€5.30 (629)	€ 1.14
Difference (After-pre-school)	€1.97	€1.10	

Sources: *Growing Up in Ireland,* Infant Cohort, Waves 2 and 3. QNHS Q3 2016, Module on Childcare.

Chapter 4 Appendix

TABLE A4.1 LOGISTIC REGRESSION MODEL OF EMPLOYMENT AT WAVE 3

		Odds Ratio	Odds Ratio
Personal characteristics	Age (years)	1.31***	0.97
	Age squared	1.00***	1.00
	Migrant	0.58***	0.95
	Chronic Illness Wave 3	0.62***	0.69***
Partner Ref: Partner Employed	Partner not employed Wave 3	0.65***	0.75**
	Lone parent Wave 3	0.64***	0.83
Other family variables	No. children Wave 2	0.68***	0.86***
	New baby Wave 3	0.63***	0.47***
	Study Child in school	0.98	0.93
Highest Qualifications Ref: Less than upper secondary	Upper secondary	1.91***	1.29
	Third level non-degree	3.19***	1.62***
	Degree or higher	5.96***	2.61***
Work Experience	Employed Wave 2		16.21***
	Employed Wave 1		1.79***
	Employed when pregnant		2.00***
	Constant	0.01***	0.26
	Observations	8,663	8,663

Sources: *Growing Up in Ireland,* Infant Cohort.
Notes: *** p<0.01, ** p<0.05, * p<0.1. For logistic model the results are presented as odds ratios. Values greater than 1 indicate that the group in question are more likely than the reference group to be in employment at Wave 3. Values less than 1 indicate the group is less likely to be employed than the reference group.

TABLE A4.2 OLS REGRESSION MODEL OF HOURS OF WORK AT WAVE 3 AMONG EMPLOYED

		Model 1	Model 2
Personal characteristics	Age (years)	1.30***	0.82*
	Age squared	-0.02***	-0.01*
	Migrant	-0.05	0.56
	Chronic illness at Wave 3	-0.81	-0.53
Partner Ref: Partner Employed	Partner not employed	-0.05	-0.04
	Lone parent	-3.10***	-2.53***
Other family variables	No. children at Wave 2	-1.87***	-1.60***
	New baby at Wave 3	-1.08**	-1.45***
	Study Child in school	0.14	0.08
Qualifications. Ref: Less than upper secondary	Upper secondary	1.85*	1.30
	Third Level non-degree	3.62***	2.67**
	Degree or higher	6.20***	5.10***
Work Experience	Employed Wave 2		4.30***
	Employed Wave 1		2.05**
	Employed when pregnant		2.48***
	Constant	6.48	8.04
	Observations	5,193	5,193
	R-squared	0.06	0.10

Sources: *Growing Up in Ireland,* Infant Cohort.
Note: Restricted to women employed in Wave 3. *** p<0.001, ** p<0.01, * p<0.05.

TESTS OF INSTRUMENTAL VARIABLE

The instrumental variable (region) is associated with childcare costs (Table A4.3). Compared to the Border region which forms the reference category, childcare costs are significantly higher in Dublin (city and county), the Mid-East and in the West, and are marginally higher in the Midland and Mid-West regions. Childcare costs are significantly lower in the South-East region. Overall region explains 5 per cent of variance in costs.

TABLE A4.3 OLS REGRESSION MODEL OF LOG WEEKLY COST WITH REGION AT WAVE 2

	Coef.	Std. Err.	P>t
Ref=Border			
Dublin	0.332	0.04	0.000
Mid-East	0.232	0.04	0.000
Midland	0.040	0.05	0.450
Mid-West	0.044	0.04	0.307
South-East	-0.149	0.04	0.000
South-West	0.066	0.04	0.105
West	0.126	0.04	0.004
Constant	4.353	0.03	0.000
N	4,251		
Adjusted R-Squared	0.0538		

Sources: *Growing Up in Ireland,* Infant Cohort.

Table A4.4 shows that the instrumental variable, region, is not directly associated with hours of work in Wave 3. The adjusted R-square shows that region explains less than 0.04 per cent of variance in hours worked for the selected sample.[54]

TABLE A4.4 OLS REGRESSION MODEL OF HOURS OF WORK AT WAVE 3

Region	Coef.
Ref: Border	
Dublin	0.06
Mid-East	0.41
Midland	-0.25
Mid-West	0.22
South-East	-1.88#
South-West	-0.07
West	0.87
Constant	28.19***
Observations	3,156
Adjusted R-Squared	.0004

Sources: *Growing Up in Ireland,* Infant Cohort.
Note: *** p<0.01, ** p<0.05, # p<0.1. Selecting those who were employed and using paid care in Wave 2.

The tests of endogeneity suggest that 'care costs' is indeed endogenous in the model of hours of work at Wave 3:

- Durbin (score) $chi^2(1) = 9.4395$ ($p = 0.0021$)
- Wu-Hausman $F(1,3098) = 9.41652$ ($p = 0.0022$)

[54] Further analysis shows that region remains insignificant if the regression is run on the whole sample.

Test of bias – the test statistic based on the minimum eigenvalue (32.1) is greater than all the critical values (Table A4.5), even at 5 per cent; therefore we can conclude that our instruments are not weak.

TABLE A4.5 CRITICAL VALUES

	5%	10%	20%	30%
2SLS relative bias	19.86	11.29	6.73	5.07
	10%	15%	20%	25%
2SLS Size of nominal 5% Wald test	31.5	17.38	12.48	9.93
LIML Size of nominal 5% Wald test	4.18	3.18	2.73	2.49

Note: These test values relate to Model 5 in Table 4.3, Chapter 4.

The model is not over-identified:

- Sargan (score) $chi^2(6) = 4.2398$ ($p = 0.6443$)
- Basmann $chi^2(6) = 4.2156$ ($p = 0.6475$)

A statistically significant test statistic indicates that the instruments may not be valid; neither test is significant for our model.

TABLE A4.6 SELECTION MODEL, USE OF PAID CHILDCARE AT WAVE 2

Selection into paid care Wave 2		
Education. Ref: Less than upper secondary	Upper secondary	-0.05
	Third level non-degree	0.06
	Degree or higher	0.18***
	New baby Wave 2	-0.06*
	No. other children Wave 2	-0.05***
Family status. Ref: Partner employed	Lone parent Wave 2	0.13**
	Partner not employed Wave 2	-0.40***
Household Income Wave 2. Ref: Bottom quintile	Quintile 2	-0.02
	Quintile 3	0.04
	Quintile 4	0.33***
	Quintile 5	0.77***
	Income missing	0.11
Working hours Wave 2. Ref: 0	1-15	0.47***
	16-29	0.92***
	30-39	1.05***
	40+	1.15***
	Crèche nearby Wave 1	0.05
	Family nearby Wave 1	-0.08**
	Constant	-0.99***
	Uncensored observations	3,796
	Censored observations	5,420

Sources: *Growing Up in Ireland,* Infant Cohort.
Note: *** p<0.01, ** p<0.05, * p<0.1.

TABLE A4.7 SELECTION MODEL, EMPLOYMENT AT WAVE 2

Selection into employment Wave 2		
Education. Ref: Less than upper secondary	Upper secondary	0.30***
	Third level non-degree	0.63***
	Degree or higher	0.88***
	New baby Wave 2	-0.21***
	No. other children Wave 2	-0.07***
Family status. Ref: Not lone parent	Lone parent Wave 2	-0.17***
Time out of employment at Wave 1. Ref: GT 5yrs or never employed	Employed Wave 1	2.14***
	1-10 months	1.17***
	11-18 months	0.93***
	19-24 months	0.38**
	25-60 months	0.14
Age. Ref: 18-24	25-29	0.16**
	30-34	0.34***
	35-39	0.39***
	40+	0.35***
	Chronic Illness Wave 2	-0.26***
	Constant	-1.96***
	Uncensored observations	5,056
	Censored observations	4,192

Sources: *Growing Up in Ireland,* Infant Cohort.
Note: *** p<0.01, ** p<0.05, * p<0.1.

TABLE A4.8 OLS REGRESSION MODEL OF MATERNAL WORK HOURS WAVE 3 WITH INCOME CONTROLS

		Model 1	Model 2	Model 3
			Add income	Add income*cost
	Childcare cost (IV) Wave 2	-4.96**	-3.71*	-41.76**
Family circumstances. Ref: Partner employed Wave 3	Partner not employed Wave 3	3.32***	3.37***	3.21***
	Lone parent Wave 3	-2.07**	-2.88***	-3.24***
Socio-demographic Variables	Migrant	1.17*	0.87	0.92
	No. children at Wave 2	-0.12	-0.10	-0.11
	New baby Wave 3	-3.66***	-3.54***	-3.61***
	Study Child at school	-0.52	-0.58	-0.57
	Chronic illness Wave 3	-1.67**	-1.70**	-1.67**
	Age	0.09	0.23	0.49
	Age squared	-0.00	-0.00	-0.01
Qualifications. Ref: Less than upper secondary	Upper secondary	0.54	0.76	1.33
	Third level non-degree	-0.19	-0.38	0.21
	Degree or higher	-0.12	-0.35	0.14
Selection Terms	Paid care Wave 2	-20.33***	-25.13***	-26.80***
	Employment Wave 2	-7.92***	-7.49***	-7.68***
Income	Log equivalised income Wave 2		-4.45***	-21.86***
	Income*childcare costs			3.72**
	Constant	65.22***	103.75***	276.95***
	Observations	3,010	3,010	3,010
	R-squared	0.14	0.15	0.15

Sources: *Growing Up in Ireland,* Infant Cohort.
Note: *** p<0.01, ** p<0.05, * p<0.1. The N is slightly lower than in Table 4.4 because some respondents did not report income.