Analysis of the Rate of Surplus for Early Learning and Care and School-Age Childcare Services in Ireland

Prepared for the Department of Children, Equality, Disability, Integration and Youth

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Gillian Paull

020 7031 7035

Gillian.Paull@frontier-economics.com

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Executive Summary

Introduction

Building on the Independent Review of Cost undertaken by Crowe in association with Apteilegen,[1] this report analyses the rate of surplus for Early Learning and Care and School-Age Childcare (ELC/SAC) services in Ireland. It describes the variation in the surplus rate across different types of services and uses regression analysis to identify the key drivers. It also compares the characteristics of services in deficit with those roughly breaking even or in surplus.

Data

The analysis uses data from the survey undertaken by Crowe/Apteilegen during March and April 2018 for the analysis of cost. As described in the cost report, this data was cleaned by Crowe/Apteilegen and the profile of the sample was shown to be reasonably matched with the population of services for a number of key characteristics, indicating that the sample is nationally representative. This report uses a subsample of services (534 services) where adequate data was available for both cost and income. As data for geographical variables (urbanity, region and deprivation) could not be shared to ensure that individual services could not be identified, Crowe/Apteilegen provided some statistics for these variables, which are reported in chapters 4 and 5.

Income-to-cost ratio (ICR)

The analysis uses the ICR as the measure of the rate of surplus.[2] The ICR is simply total income divided by total (operational) delivery cost.[3] If total income equals total cost, the ICR equals one. The ICR is greater than one if total income exceeds total cost and is less than one if total cost exceeds total income.

The rate of surplus is normally presented as the amount of surplus expressed as a percentage of total cost, capturing the return for each € of cost invested. The ICR has a direct correspondence to this. For example, a service with total income of 120 and total cost of 100 would have an ICR of 1.20, corresponding to a rate of surplus of 20%. Alternatively, a service with total income of 95 and total cost of 100 would have an ICR of 0.95, corresponding to a rate of surplus of -5% (more typically described as a rate of deficit of 5%).

[1] Crowe/Apteilegen (2020), *Review of the Cost of Providing Quality Childcare Services in Ireland*, Department of Children and Youth Affairs, March https://www.gov.ie/en/publication/1fbfe-crowe-report-review-of-the-cost-of-providing-quality-childcare-services-in-ireland-march-2020/

[2] As used in analysis for England in Cattoretti, G., Paull, G. and Marshall, L., (2019), *Providers' Finances: Evidence from the Survey of Childcare and Early Years Providers 2018*, Department for Education Research Report DFE-RR896, March https://www.gov.uk/government/publications/provider-finances-evidence-from-early-years-providers and in Paull, G. and Wilson, C., (2020), *Providers' Finances: Evidence from the Survey of Childcare and Early Years Providers 2019*, Department for Education Research Report DFE-RR1008, October https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929325/SCEYP_2019_Finance_Report.pdf.

[3] Total income includes parent-paid fees, government funding and any other income sources such as charitable donations. Total (operational) delivery costs include all outgoings except investments into the business which contribute to the accumulation of assets and payments for returns on previous investments.

The mean value of the ICR in the survey data is 1.14. On average, for every €1 of cost, providers receive €1.14 in income. This is equivalent to a surplus rate of 14%.[4] The mean ICR for private providers is 1.19 (a surplus rate of 19%) and the mean ICR for community providers is 1.03 (a surplus rate of 3%).

The median value for the ICR is 1.04, indicating that half of providers receive €1.04 or less in income for each €1 of cost (equivalently, have a surplus rate of 4% or less), while the other half receive €1.04 or more (equivalently, have a surplus rate of 4% or more). When all providers are ranked from lowest to highest, the middle provider ICR receives €1.04. The fact that the median is lower than the mean shows that the distribution is right-skewed with a longer tail towards higher (surplus) values around the peak of the distribution.

Findings for types of services with a higher mean ICR

Some types of services have a higher mean ICR, indicating that provision generates a higher rate of surplus for these services:

- Regarding organisation type, the mean ICR is higher for sole traders[5] than limited companies or partnerships and community services and is higher for limited companies or partnerships than community services.
- Regarding service type, the mean ICR is higher for services which do not offer full day or wrap-around care, are open exactly 38 weeks each year (rather than more than 38 weeks) and do not have any children under the age of two.
- Regarding factors which may drive the cost part of the ICR, the mean ICR is higher for services with high occupancy, medium (rather than low or high) levels of average group size and low total numbers of childcare hours. The mean ICR is also higher for services which are single site (rather than multisite) and which do not pay staff benefits.[6]
- Regarding government funding, the mean ICR is higher for services whose only income source is from the Early Childhood Care and Education (ECCE) programme.
- Regarding quality measures, the mean ICR is higher for services with medium (rather than low or high) levels of staff qualifications.

These findings do not indicate that these characteristics directly drive the higher ICR, only that, for whatever reason, these kinds of services tend to have higher ICRs. Indeed, many of these characteristics tend to overlap and some services will have similar bundles all associated with a higher ICR. The following set of findings seeks to identify which characteristics are the key ones within these bundles for the association with a higher ICR.

[4] The average surplus reported as a proportion of income (6.9%) is lower because the ICR implicitly measures average surplus as a proportion of cost which, on average, is a smaller base than income.

[5] It should be noted that the total cost measure includes a salary for sole traders, which means that the ICR for sole traders is calculated after the salary has been extracted.

[6] The precise definitions for these characteristics are presented in table 1 in chapter 2.

Findings for the drivers of the ICR

Estimations of regression models allow the key driving characteristics in these bundles to be identified by controlling for the mix of characteristics of services which have higher ICRs. This analysis suggests that there are a small number of direct drivers of the ICR which underpin the patterns across different types of services. These key drivers are:

- Being a sole trader is associated with a higher ICR than being a limited company or partnership or a community provider, while being a limited company or partnership is associated with a higher ICR than being a community provider. Given that community providers tend to be specifically not-for-profit, the association with the lowest rate of surplus is not surprising. There are several possible reasons why sole traders appear to have a higher rate of surplus than limited companies, including differences in how staff salary is measured; compensation for greater financial risk; compensation for higher tax liabilities; and lower delivery costs due to less regulatory burden or greater efficiency in delivery.
- Having no children under the age of two is associated with a higher ICR than having a child under age two. Given that younger children have higher delivery costs due to the need for higher levels of staffing, a lower surplus rate for services catering for the youngest group is not surprising.
- Offering types of services other than childcare[7] is associated with a higher ICR. This may be due to economies of scale reducing delivery costs or could arise from higher income from parents or government for the broader range of services.
- Having average staff qualifications at the middle level is associated with a higher ICR than having low or high average qualifications. The highest mean ICR for the middle group may be explained by different dynamics for the delivery cost and income: raising qualifications from the low to the middle category may increase income sources (from parents and government) to a relatively greater extent than the increase in delivery cost due to the need for higher staff salaries to pay more qualified staff, while raising qualifications from the middle to high group may have greater impacts on delivery costs than income.

This suggests that although other types of services (those not offering full day or wrap-around care; those open exactly 38 weeks each year; those with high occupancy, medium levels of average group size or low total numbers of childcare hours; single-site services; those not paying staff benefits; and those whose only income source is ECCE funding) have higher levels of ICR, this is only because they also have one or more of the key drivers.[8]

[7] Examples of these other services were given in an open-ended question in the survey and included renting rooms for counselling, Irish dancing classes and local organisation meetings; adult education for Childcare Courses; English classes for new communities; mother and baby yoga; parent and toddler; Family Support Worker; Mental Health Worker; a Hub & Youth Café; and primary school.

[8] The high proportions of sole traders among services with high occupancy or average group size or which are single site and have ECCE as their only income source partly explain why these services have a higher mean ICR, but other key drivers are also part of the explanation.

Findings for the profile of services in deficit, breakeven and surplus

Services were classified into three groups of being in deficit (ICR less than or equal to 0.950), breakeven (ICR greater than 0.95 and less than 1.1) and surplus (ICR equal to 1.1 or greater).[9] Some 17% of the sample were in deficit, 46% in breakeven and 37% in surplus. The characteristics for services in deficit are broadly similar to those for services in breakeven and in surplus, indicating that services in deficit and surplus do not have distinctive profiles from all services. Although this suggests that the likelihood of being in deficit, breakeven or surplus does not vary substantially across service types, the analysis of the mean ICR showed that there are important variations across service types which are not captured in the three broad groups defined as deficit, breakeven and surplus.

Implications

These findings are robust to the extent that they are drawn from a large representative sample and the relationships have been thoroughly tested. The findings are also broadly consistent with similar analysis for ELC/SAC provision in England, notwithstanding the differences in the nature of the sector between the countries and the differences in datasets and modelling approaches.

This analysis has shown that the rate of surplus varies across different types of ELC/SAC services. However, very little is known about how this surplus is used and the consequences of this variation despite increasing levels of public funding being spent in this sector. The collection of robust data on the use of any surplus faces formidable challenges in obtaining financially sensitive information from providers in a competitive market sector. While public discussion focuses on the need for a surplus to maintain, improve and expand services, there is the possibility that some surplus may accrue to service owners at above-normal levels of investment returns.

[9] The asymmetric cut-offs of 0.95 and 1.1 were selected to ensure a sufficiently high number in the deficit group and a sufficiently small number in the surplus group (as symmetric cut-offs around 1 generated either very small deficit groups or very large surplus groups). An examination of the profiles using alternative cut-offs generated very similar profiles to those for the selected cut-offs.

1. Introduction

Building on the Independent Review of Cost undertaken by Crowe in association with Apteilegen,[10] this report analyses the rate of surplus for Early Learning and Care and School-Age Childcare (ELC/SAC) services in Ireland. It describes the variation in the surplus rate across different types of services and uses regression analysis to identify the key drivers. It also compares the characteristics of services in deficit with those roughly breaking even or in surplus.

The analysis in this report uses data from the survey undertaken by Crowe/Apteilegen during March and April 2018 for the analysis of cost. As described in the cost report, this data was cleaned by Crowe/Apteilegen and the profile of the sample was shown to be reasonably matched with the population of services for a number of key characteristics, indicating that the sample is nationally representative.[11] This report uses a subsample of services (534 services) where adequate data was available for both cost and income. In addition, data for geographical variables (urbanity, region and deprivation) could not be shared for this analysis to ensure that individual services could not be identified.

The remainder of the report is arranged as follows:

- Chapter 2 discusses the potential influences on the surplus rate for ELC/SAC services in Ireland.
- Chapter 3 introduces the income-to-cost ratio (ICR) and presents background information on the ICR.
- Chapter 4 analyses differences in the ICR across service characteristics and presents the findings on the key drivers from regression models.
- Chapter 5 examines the profile of characteristics for services in deficit, in breakeven and in surplus.
- Chapter 6 summarises the findings, drawing comparisons with other work, and discusses some implications of the findings.

As data for the geographical variables could not be shared, Crowe/Apteilegen provided some statistics for these variables for mean ICRs in chapter 4 and the service profiles in chapter 5. However, it was not possible to include these variables in the regression analysis for chapter 4.

[10] Crowe/Apteilegen (2020), *Review of the Cost of Providing Quality Childcare Services in Ireland*, Department of Children and Youth Affairs, March https://www.gov.ie/en/publication/1fbfe-crowe-report-review-of-the-cost-of-providing-quality-childcare-services-in-ireland-march-2020/

[11] This meant that weighting of the data to match population statistics was not required.

2. Potential Influences on the Surplus Rate

This chapter describes the service characteristics which may influence the surplus rate for ELC/SAC services in Ireland and the possible mechanisms of influence.

Table 1 provides a description of the potential influences that were available in the survey data for consideration in this report. These have been grouped into six categories which might influence the surplus rate in a similar manner.

It should be noted that the surplus rate will be influenced via hourly delivery cost or hourly income or a mix of both. For example, a characteristic could push up the cost of delivery but at the same time increase income because parents or government are willing to pay more for that characteristic. In some cases, therefore, the characteristic may have an ambiguous theoretical impact on the surplus rate because this will depend upon the sizes of the impacts on cost and income.

The first two characteristics in table 1 (private or community and whether a sole trader) are described as **organisation type**. These capture the underlying motivations and organisational efficiency of the provider which can affect a large range of delivery choices which feed into the surplus rate. A priori, it might be expected that private providers would have a higher surplus rate than community ones because private providers may have greater pressures to deliver a return to investments while community providers are typically not-for-profit. There may also be differences between sole traders and other types of services due to differences in business organisation or regulation for sole traders.

The second set of characteristics, called **service type,** captures a range of characteristics related to the nature of the service, covering the hours of ELC/SAC and age of children catered for. These service type characteristics can have cost implications. More hours per day or week or year could be more costly because they require more complex staffing arrangements or could be less costly because there are economies of scale from delivering more hours (such as a constant venue rent regardless of hours or weeks used). Younger children tend to be more costly due to greater staffing requirements. Delivery of other types of services[12] may also affect costs if there is cross-subsidisation or if they affect the quality of ELC/SAC service. However, the service type will also influence income via the prices parents are willing to pay for different hours or age of child and whether government funding covers some hours or age of children. The potential overall impacts on the surplus rate are therefore ambiguous.

[12] Examples of these other services were given in an open-ended question in the survey and included renting rooms for counselling, Irish dancing classes and local organisation meetings; adult education for Childcare Courses; English classes for new communities; mother and baby yoga; parent and toddler; Family Support Worker; Mental Health Worker; a Hub & Youth Café; and primary school.

Table 1: Potential influences on the surplus rate

Characteristic	Description
Organisation type	
Private or community	Indicator for community provider (rather than private provider)
Sole trader	Indicator for sole trader (rather than limited company or partnership)
Service type	
Offers full day	Indicator for full day care (with or without other types of sessions)
Offers wrap-around care	Indicator for breakfast club and/or after school care (with or without other types of sessions)
Open more than 38 weeks	Indicator for open more than 38 weeks each year (rather than exactly 38 weeks)
Age of youngest child	Four groups of under-age two, age two, age three or four preschool children and school age
Offers other types of services	Indicator for offering services other than ELC/SAC
Factors influencing delivery cost	
Occupancy	Proportion of places that are filled, analysed as three groups of low (less than 0.8), medium (0.8 to 0.95) and high (greater than 0.95) Also analysed as a continuous variable
Average group size	Average number of children in each session, analysed as three groups of low (fewer than 12), medium (12 to 17) and high (greater than 17). Also analysed as a continuous variable
Number of hours of ELC/SAC	Total number of hours of ELC/SAC per year, analysed as three groups of small (fewer than 15,000 hours), medium (15,000 to fewer than 50,000 hours) and large (50,000 or more) Continuous variable not available for analysis
Multisite (part of chain)	Indicator for service being part of a chain which operates on multiple sites

Characteristic	Description
Staff benefits	Availability of benefits for at least some staff, analysed as three groups of none, only sick pay, and some other combination of pensions, sick pay and top-up maternity leave pay
Premises type	Premises type analysed as three categories of owned (commercial or domestic building), formal lease (commercial or non-commercial lease) and neither
Government funding	
Only ECCE income	Indicator that all income is government funding for the Early Childhood Care and Education (ECCE) scheme, which provides free places for children from age two years and eight months
Higher capitation for ECCE	Indicator that ECCE funding is paid at a higher rate when staff delivering the ECCE hours hold higher qualifications
Quality	
Paid time for CPD	Indicator that there is paid Continuing Professional Development (CPD) time (either as leave or overtime) rather than CPD which is provided outside work hours or as unpaid leave
Graduate led	Indicator that at least one member of frontline staff holds a bachelor's degree in ELC/SAC/ early education
Average staff qualification level	Average highest staff qualification level (using Ireland NFQ range of 1 to 10), analysed as three groups of low (less than 6), medium (6 to 6.5) and high (greater than 6.5) Also analysed as a continuous variable
Geographic area	
Rural	Indicator variable for rural area (rather than urban area)
Region	Eight regions

Characteristic	Description
Deprivation index	Local deprivation index, analysed as five groups of affluent, marginally above average, average, marginally below average and disadvantaged

The third set of characteristics called **factors influencing delivery cost** contains a more eclectic set with a common element that they are most likely to only influence the efficiency of delivery[13] (rather than the nature of delivery) and therefore primarily affect the surplus rate through cost alone. These include:

- Occupancy and average group size: higher occupancy and higher group size increase the number of ELC/SAC hours delivered for a given amount of resources and reduce the hourly delivery cost. Hence, higher occupancy and larger groups should be associated with a higher surplus rate.
- Total number of hours of ELC/SAC per year and being part of a multisite chain could reduce cost through economies of scale, whereby for a larger organisation fixed costs or the cost of core functions (such as administration) can be spread over more hours. However, it should be noted that *dis*economies of scale can occur when an organisation becomes so large that additional fixed costs to organise the larger enterprise (such as requiring staff to manage communications) can increase hourly costs. Hence, these factors may increase the surplus rate, but may reduce it at the higher end of scale.
- Staff benefits and premises type can have an impact on cost through the prices paid for resources. Staff benefits increase the price of staffing, while ownership or leasing of premises can have systematically different financial costs[14] and rent-free premises unambiguously have lower costs. Hence, payment of staff benefits is likely to be associated with a lower surplus rate,[15] while different premises types may be associated with other differences.

The fourth set of characteristics, called **government funding,** captures the extent to which providers rely on government funding for income (only ECCE income) and whether they are paid a higher rate for government funding for using more qualified staff. As the income source (who pays for the ELC/SAC) should not affect costs, whether only having income from ECCE will increase or decrease the surplus rate will depend upon whether the ECCE hourly funding rate is higher or lower than the hourly amount that would otherwise have been paid by parents. Whether the higher funding rate for higher staff qualifications has a positive or negative effect on the surplus rate will depend upon whether the additional funding outweighs any

[13] Higher efficiency means that the same output (number of childcare hours) is obtained using fewer resources or can mean that resources are obtained for lower cost.

[14] The term "financial" is used here because the economic cost (including foregone rent on owned premises) may be closer than financial payments. However, the cost data used here is based only on financial costs.

[15] It could be the case that staff benefits attract better quality staff, which means that the service can command a higher price for its services, which could offset the higher cost (similarly to higher staff qualifications discussed below). However, these links are more tenuous than those for staff qualifications and so staff benefits are listed here as primarily a cost push factor.

additional costs of using more qualified staff. Hence, for both factors, the impact on the surplus rate is a priori ambiguous.

The fifth set of characteristics, called **quality,** captures measures which are considered to improve staffing quality (paid CPD time, graduate leadership and average staff qualifications). Although these factors push up cost, they may also increase income if parents and government pay more for better quality and the overall impact on the surplus rate is a priori ambiguous.

The final set of characteristics captures local **geographic area**. For urbanity and region, costs may vary due to differences in local prices for staffing and resources, but demand affecting income can also vary across rural and urban areas and across regions. More affluent areas are sometimes considered to have higher delivery costs, but parents may also be able to pay higher prices, raising income. Hence, the balance in impacts on cost and income across areas will determine the overall variation in the surplus rate across areas.

3. Description of the Income-to-Cost Ratio

This chapter provides background information on the income-to-cost ratio (ICR). The first section defines the ICR and the second presents the distribution of the ICR for ELC/SAC services in Ireland. The remaining three sections provide an overview of the relationships between the ICR and total cost, average wages and average fees.

3.1 What is the income-to-cost ratio (ICR)?

The analysis uses the ICR as the measure of the rate of surplus.[16] The ICR is simply total income divided by total (operational) delivery cost.[17] If total income equals total cost, the ICR equals one. The ICR is greater than one if total income exceeds total cost and is less than one if total cost exceeds total income.

The ICR has several advantages over other measures of surplus:

- It informs on the rate of return (the income for each € of cost), whereas a measure of the absolute amount of surplus would largely capture the size of the service.
- It avoids the need to use dual terms of profit (for profit-making services) and surplus (for non-profit services).
- It accurately reflects the description of the measure, whereas the rate of surplus (or profit) can be variously used to describe pre- or post-tax profits, with or without allowance for asset depreciation, or before or after debt servicing.[18]
- It has a parsimonious interpretation by being defined over a strictly positive range. The surplus rate (defined as the difference between total income and total cost, divided by the total cost) has a range over negative and positive values and requires use of the terms “lower deficit or higher surplus” or “higher deficit or lower surplus” when describing relationships or patterns across different types of services.
- It can be compared to analysis of the ICR for ELC/SAC services in other countries.

[16] As used in analysis for England in Cattoretti, G., Paull, G. and Marshall, L., (2019), *Providers' Finances: Evidence from the Survey of Childcare and Early Years Providers 2018*, Department for Education Research Report DFE-RR896, March https://www.gov.uk/government/publications/provider-finances-evidence-from-early-years-providers and in Paull, G. and Wilson, C., (2020), *Providers' Finances: Evidence from the Survey of Childcare and Early Years Providers 2019*, Department for Education Research Report DFE-RR1008, October https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929325/SCEYP_2019_Finance_Report.pdf.

[17] Total income includes parent-paid fees, government funding and any other income sources such as charitable donations. Total (operational) delivery costs include all outgoings except investments into the business which contribute to the accumulation of assets and payments for returns on previous investments.

[18] The information required to use these more specific definitions is not available in the data source and is typically not available for large-scale data collection for childcare services.

3.2 The average ICR

The mean value of the ICR in the survey data is 1.14. On average, for every €1 of cost, providers receive €1.14 in income.[19] This is equivalent to a rate of surplus of 14%.[20] The mean ICR for private providers is 1.19 (a surplus rate of 19%) and the mean ICR for community providers is 1.03 (a surplus rate of 3%).

In the Crowe/Apteilegen report, the mean rate of profit reported as a proportion of income is 10.0% for private enterprises and 0.1% for community organisations. The mean rate for all services is 6.9% (not reported in the Crowe/Apteilegen report). This means that for every €1.07 of income, €0.07 is surplus. As described in the previous section, these rates are lower than for the ICR measure because they are measured as a proportion of income which, on average, is higher than cost.

The median value for the ICR is 1.04, indicating that half of providers receive €1.04 or less in income for each €1 of cost (equivalently, have a surplus rate of 4% or less), while the other half receive €1.04 or more (equivalently have a surplus rate of 4% or more). When all providers are ranked from lowest to highest ICR, the middle provider receives €1.04. The fact that the median is lower than the mean shows that the distribution is right-skewed with a longer tail towards higher (surplus) values around the peak of the distribution.

Table 2: Mean and median ICR in Ireland and England

	Mean ICR	Median ICR	Number of providers
Private providers:			
- Ireland 2018	1.19	1.06	368
- England 2018	1.70	1.17	423
- England 2019	1.58	1.15	548
Community/voluntary providers:			
- Ireland 2018	1.03	1.01	166
- England 2018	1.34	1.04	411
- England 2019	1.27	1.03	527

Source: Statistics for England are from table 13, Paull and Wilson (2020).[21]

[19] To note, this is the mean of the ICR for each provider and not the ratio of total income for all providers divided by total cost for all providers. The measure used gives equal weight to the ICR for all providers, while the total income divided by total cost would give more weight to the ICR for larger providers. The two measures could be quite different.

[20] The average surplus reported as a proportion of income (6.9%) is lower because the ICR implicitly measures average surplus as a proportion of cost which, on average, is a smaller base than income.

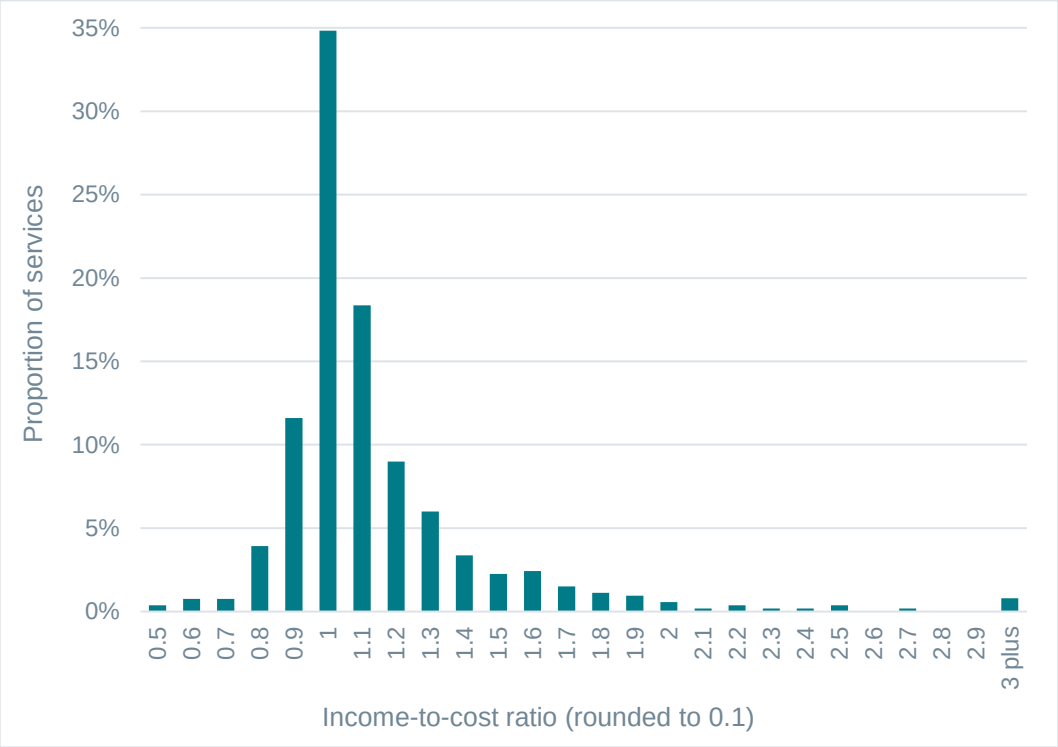
[21] Paull, G. and Wilson, C., (2020), *Providers' Finances: Evidence from the Survey of Childcare and Early Years Providers 2019*, Department for Education Research Report DFE-RR1008, October https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929325/SCEYP_2019_Finance_Report.pdf

The mean and median values for the ICR in Ireland in 2018 can be compared with statistics from England for 2018 and 2019 (table 2). The mean ICR in Ireland is substantially lower than that for England for both private and voluntary providers, while the median is higher in England than in Ireland for private providers and at a similar level in both countries for community (voluntary) providers. This limited comparison of only two countries suggests that the surplus rate is not unusually high in Ireland.

3.3 The distribution of the ICR

Figure 1 presents the distribution of the ICR for Ireland, showing the percentage of providers with an ICR rounded to the nearest 0.1. Just under 35% of providers have an ICR within the range of 0.95 to 1.05 (shown as the rounded value 1) and a further 18% have an ICR in the range of 1.05 to 1.15. Just over 17% have ICRs below 0.95, while the remaining 30% have ICRs in excess of 1.15. The substantial proportion around and just above the breakeven point of 1 is consistent with the view that the sector does not earn high profits. The relatively low proportion with ICRs below 0.95 would also be expected as providers should not be able to sustain a deficit for prolonged periods.

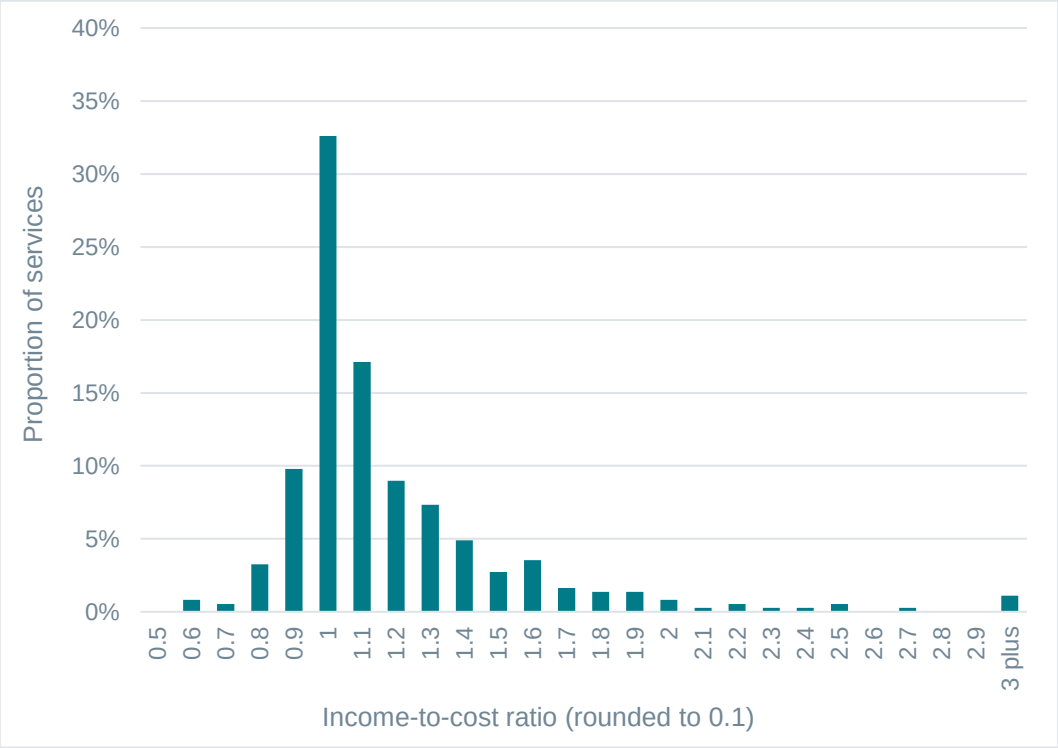
Figure 1: Distribution of the ICR



Notes: Sample size is 534 providers.

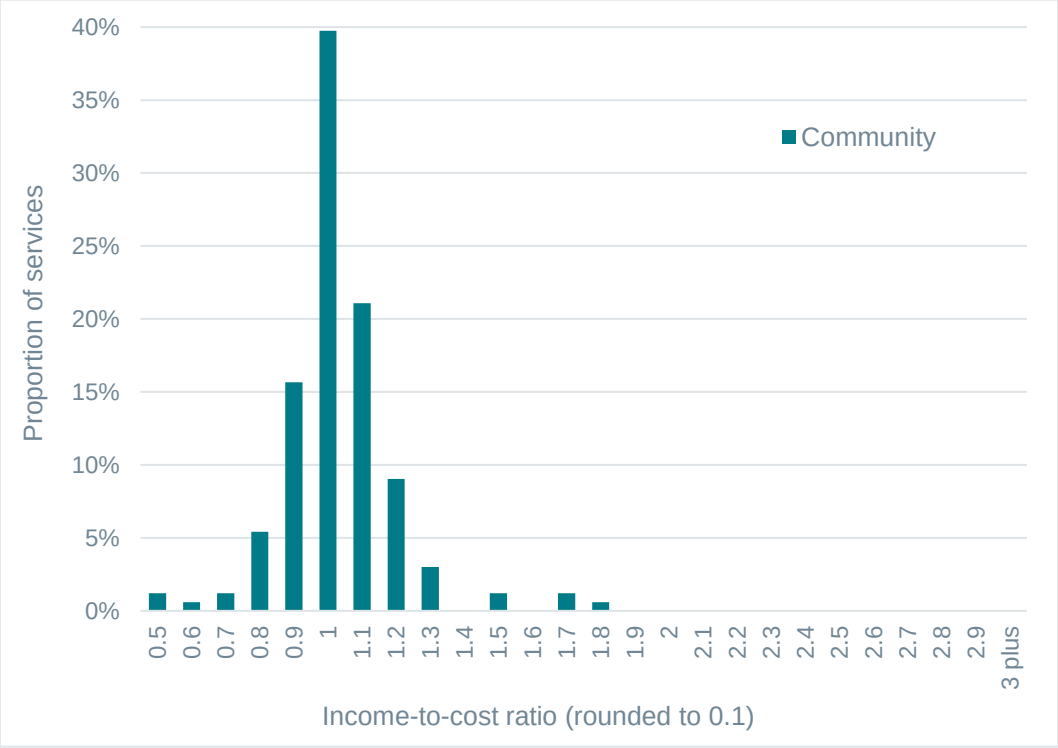
Figures 2 and 3 show the distributions for private and community providers. While there is some greater tendency for community providers to be towards the lower end of the distribution, the difference with private providers is perhaps not as marked as might be expected given the difference in profit objectives.

Figure 2: Distribution of the ICR for private providers



Notes: Sample size is 368 private providers.

Figure 3: Distribution of the ICR for community providers

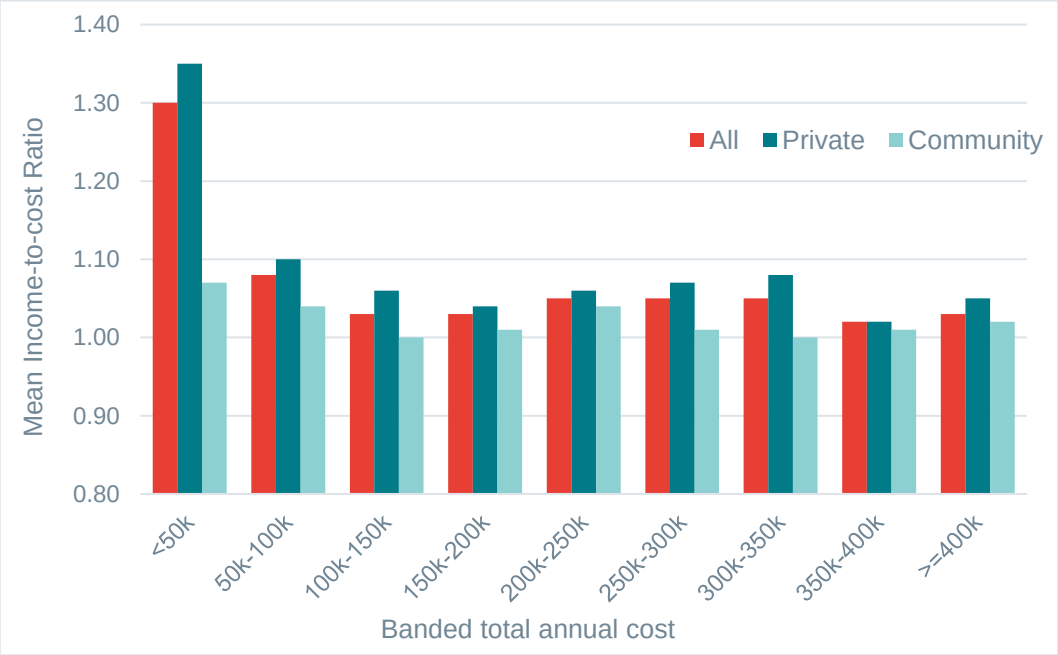


Notes: Sample size is 166 community providers.

3.4 ICR and total cost

Figure 4 presents the average ICR by banded total annual cost. The blocks in red for all providers show that the ICR is substantially higher for providers in the lowest cost band (1.3 compared to between 1.2 and 1.8 for all other cost bands).[22] This pattern is primarily driven by private providers (shown in the dark blue blocks) rather than community providers (shown in the light blue blocks). The pattern is somewhat surprising as a smoother relationship with provider size (as captured in total cost) might have been expected. In addition, figure 4 shows that the mean ICR is lower for community providers than private ones at every level of total cost, which would have been expected.

Figure 4: Mean ICR by total annual cost



Notes: Sample sizes are 534 for all providers, 368 for private providers and 166 for community providers.

3.5 ICR and average wages

Figure 5 presents the average ICR by banded[23] average wages for all staff and for three different levels of staff.[24]

[22] There are 179 providers in the lowest cost band, indicating that this pattern is not being driven by a small number of providers in the lowest band.

[23] The data was analysed for three bands (tertiles) and five bands (quintiles), but the quartile bands had the greatest explanatory power.

[24] Average wages were collected in the survey for eight types of staff. The averages for owner-manager (owner-operator) and manager employed by service were combined in managers; the averages for ECCE room leader and non-ECCE room leader were combined in room leaders; and the averages for childcare/early education assistants, other childcare/early years staff and childcare/early years work placement staff were combined in assistants (and Aim Level 7 support staff were not used). This data was trimmed in 12 cases for managers with an hourly wage in excess of €100, in three cases for room leaders with an hourly wage in excess of €30, and in two cases for assistants with an hourly wage in excess of €30. For all staff, a weighted average was calculated across the three staff types with weights of 18% for managers, 32% for room leaders and 50% for assistants, reflecting the proportions of staff in these categories reported in Pobal (2019), *Annual Early Years Sector Profile Report 2018/2019*, December, https://www.pobal.ie/app/uploads/2019/12/Annual-Early-Years-Sector-Profile-Report-AEYSPR-2018-19.pdf, page 126.

Figure 5: Mean ICR by average wages

Notes: Sample sizes are 458 for all staff, 501 for managers, 390 for room leads and 384 for assistants. The wage groups divide each sample into four roughly equal quartiles. For all staff, the mean ICR was statistically significantly higher for services with average to high wages than for services with low to average wages (at the 90% level). For room leaders, the mean ICR was statistically significantly lower for services with high wages than for services with low wages (at the 90% level), services with low to average wages (at the 99% level) and services with average to high wages (at the 95% level). There were no statistically significant differences for managers and for assistants.

For all staff, the mean ICR is slightly lower for services with average wages in the low to average group and the difference with the average to high wage group is statistically significant. However, there is no consistent pattern across the wage distribution.[25] For managers, the mean ICR is highest for the lowest wage group, but there are no statistically significant differences in the ICR across the wage groups.[26] For room leads, the high wage group has a substantially lower (and statistically significantly different) mean ICR than all other groups. In addition, regression analysis shows that, on average, every €1 higher mean wage is associated with a decrease in the ICR of 0.01.[27] The pattern for assistants shows a slight increases in the mean ICR at higher wage levels for the first three groups, although the differences are not statistically significant. Regression analysis indicates that, on average, the ICR increases with the wage for assistants.[28] The contrasting relationships across the three staff types underpins the lack of a clear pattern for all staff.

[25] Linear and quadratic regression models for all staff did not identify any statistically significant relationship between the ICR and the average wage.

[26] Linear and quadratic regression models for managers did not identify any statistically significant relationship between the ICR and the average wage.

[27] The coefficient in the linear regression for room leaders was -0.010 (statistically significant at the 95% level).

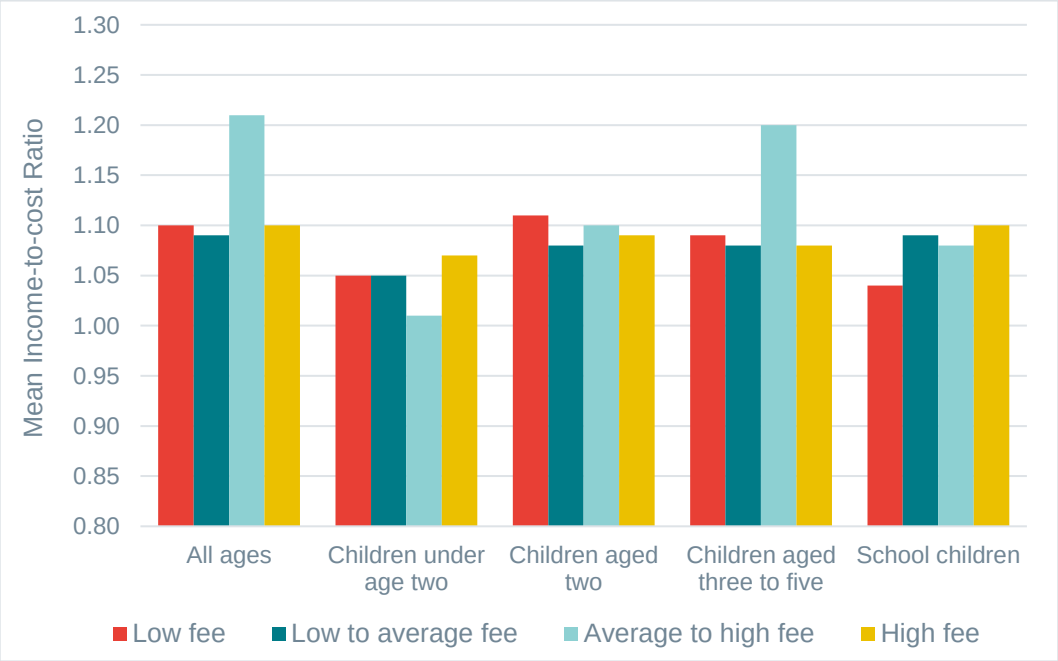
[28] The coefficient in the linear regression for assistants was not statistically significant, but the coefficient for the linear term in the quadratic regression was 0.051 (significant at the 95% level) and the coefficient for the quadratic term was -0.002 (significant at the 99% level). This indicates that, on average, the mean ICR increases with rises in the wage for wages below €25.50 and decreases with rises in the wage for wages above €25.50. As almost all of the distribution (382 of the 384 observations in the data) lies below this turning point, the ICR broadly increases with the wage level for assistants.

Overall, this suggests that lower pay for some types of staff (managers and room leaders) and higher pay for other types of staff (assistants) tends to be associated with a higher ICR. The first (and slightly stronger) of these two patterns is consistent with the hypothesis that services can generate a higher surplus by paying lower wages. But the combination of the two patterns may indicate some underlying relationships with the mix of staff employed and the pay inequality across different staff within services.

3.6 ICR and average fees

Figure 6 presents the average ICR by banded[29] average fees for all children and for four different ages of children.[30]

Figure 6: Mean ICR by average fees



Notes: Sample sizes are 424 for all ages, 133 for children under age two, 210 for children aged two, 356 for children aged three to five and 176 for school children. The four fee groups divide each sample into four roughly equal quartiles. For all ages, the mean ICR was statistically significantly higher for services with average to high fees than for services with low fees (at the 95% level), services with low to average fees (at the 99% level) and for services with high fees (at the 95% level). For children under age two, the mean ICR was statistically significantly lower for services with average to high fees than for services with low to average fees (at the 90% level) and for services with high fees (at the 90% level). For children aged three to five, the mean ICR was statistically significantly higher for services with average to high fees than for services with low fees (at the 95% level), services with low to average fees (at the 99% level) and for services with high fees (at the 99% level). There were no statistically significant differences for children aged two and for school children.

[29] As with the average wage, the data was analysed for three bands (tertiles) and five bands (quintiles), but the quartile bands had the greatest explanatory power.

[30] Average fees were collected in the survey for five ages of children and the average fee for children under age one and for children aged one to two were combined to provide an average fee for children under age two. For preschool ages, the average fee was calculated as the average across full day, part day and sessional care and for school children, the average fee was calculated as the average across breakfast clubs and after-school care. The data was trimmed in four cases where the hourly fee exceeded €20. Of the 426 services reporting fee data, 109 (26%) did not have data on hours and the hourly rate was estimated using the average hours for the same session type in other services. These imputed hourly fees did not substantively change the findings but enhanced the precision of the significance tests. In addition, because the fees were reported without reference to the period that they covered (that is, whether they were per day/session or per week), some were adjusted to obtain a reasonable hourly value.

For children of all ages, services with fees in the average to high group have a substantially higher (and statistically significantly different) mean ICR than each of the other three fee groups. This mirrors the pattern for fees for children aged three to five, partly because the pattern is so strong for this age group and partly because fees for this age group make the greatest contribution to the average fee for all ages of children.[31] The opposite pattern exists for fees for children under age two (those with average fees in the average to high fee group have the lowest mean ICR), although the pattern is weaker. For school children, there is some tendency for the mean ICR to be higher for higher fee groups, but there were no statistically significant differences (and there is little pattern for fees for children aged two).[32]

While the pattern for school children is consistent with the hypothesis that services can make a higher surplus by charging higher fees, the dominating pattern for all ages of children is that services with fees somewhat above average (but not the highest) can make the higher surplus.

[31] Specifically, of the 424 services with an hourly fee, 356 had an hourly fee for children aged three to five compared to 133 for children under age two, 210 for children aged two and 176 for school-age children.

[32] Linear and quadratic regression models for fees for all ages and for each age group did not identify any statistically significant relationship between the ICR and the average fee.

4. Drivers of the Income-to-Cost Ratio

This chapter analyses the drivers of the ICR by examining how the ICR varies across service characteristics. The first section describes the definition of services in deficit, breakeven and surplus, while the second describes the analysis methodology and how to interpret the results. The following six sections present the analysis findings for organisation type, service type, characteristics potentially related to cost, government funding, quality measures and geographic area.

4.1 Definition of deficit, breakeven and surplus

The tables in this chapter present the mean ICR and the proportions of providers which are in deficit, breakeven and deficit, defined as:

- Deficit: ICR is less than or equal to 0.95
- Breakeven: ICR is greater than 0.95 and less than 1.1
- Surplus: ICR is 1.1 or greater

The breakeven category is defined as a range around the value of 1 (where total income exactly equals total cost) to capture whether services are approximately breaking even. The asymmetric cut-offs of 0.95 and 1.1 were selected to ensure a sufficiently high number in the deficit group and a sufficiently small number in the surplus group (as symmetric cut-offs around 1 generated either very small deficit groups or very large surplus groups).[33] The breakeven group therefore includes those slightly below and slightly above breakeven. The selected cut-offs generated groups of 93 providers (17% of the sample) in deficit, 244 (46%) in breakeven and 197 (37%) in surplus.[34]

4.2 Analysis methodology

In each section below, the initial table presents the mean ICR for services with each category of characteristic and the proportions of services which are in deficit, breakeven and surplus (using the definition described in section 4.1). Hence, these three proportions in each row sum to 100% (or approximately 100% due to rounding). The mean ICR provides a simple comparative statistic to compare the average values across categories, while the proportions in deficit and surplus provide additional information on the distribution of the ICR for services with a given category of characteristic. For example, two categories could have identical mean ICRs but one could have higher proportions in deficit and in surplus, indicating greater variation in the ICR category.

[33] An examination of the profiles using alternative cut-offs generated very similar profiles to those for the selected cut-offs.

[34] The proportion in deficit corresponds to the 17% with a rounded ICR at 0.9 or below in figure 3; the proportion in breakeven contains those rounded to 1.0 (35%) and a proportion of those rounded to 1.1 (11% of the 18%) in figure 3; and the proportion in surplus contains the remaining proportion of those rounded to 1.1 (7% of the 18%) and those with a rounded ICR at 1.2 or above (30%).

The second table in each section presents findings from tests of the statistical significance of the differences across the categories for "raw differences" and for "regression models":

- The "raw differences" are simple tests for the single characteristics and the tests indicate whether there is reasonable confidence (at the 90%, 95% and 99% levels) that the differences observed in the sample reflect true differences in the entire population of all services.
- The "regression models" similarly test whether there is reasonable confidence that the characteristics are associated with a true difference in the ICR, but the models control for other related characteristics which may be driving the differences.

Hence, while the raw differences indicate which types of services have higher ICRs (whatever the reason for the differences), the regression models indicate which characteristics actually drive variation in the ICR. Both offer useful information for policy design. On the one hand, understanding the drivers rather than just raw differences can enable more efficient design or targeting of policy. On the other hand, if it is not possible to design policy which targets the driving characteristics, the raw differences across characteristics can provide a proxy targeting approach.

It should be noted that all the statistical significance tests consider whether there is any difference (that is, whether the difference is not zero). They do not test whether the observed size of the difference is likely to be true in the population of all services. Hence, the second table presents only whether one category has a statistically significant higher ICR than another category. Changes in the "point estimates" of the size of the differences are sometimes described in the text, but there is no degree of confidence that these are true attached to these.

Four sets of test results are presented in each table:

- Tests for raw differences across the single characteristic.
- A "group" regression model which includes all the characteristics presented in the section to identify the drivers within the group.
- A "complete" regression model which includes all characteristics (except urbanity, region and deprivation level[35]) to identify the drivers across all characteristics.
- A "preferred" regression model which includes all characteristics (except urbanity, region and deprivation level) but excludes the indicators for paid CPD and graduate led to identify the drivers in a model with the highest explanatory power.[36]

Findings for the three regression models are presented to help understanding of the relationships between the drivers.

[35] As described in the introduction, these variables could not be provided with the data and only limited analysis could be undertaken for urbanity, region and deprivation.

[36] The preferred model had a higher R-squared value than the complete model and all other variants that were tested, as described in Annex A.

Statistical tests and the estimation of the regression models were only applied to the continuous ICR variable and not to the three-category variable of in deficit, breakeven and surplus. This was for several reasons:

- Using the three-category variable ignores a large part of the information in the variation in the ICR within the three categories.
- Estimating regression models for a three-category variable is substantially more demanding statistically than for a single continuous variable: either a multinomial probability model must be used or two single probability models for the likelihood of being in deficit and the likelihood of being in surplus.
- Interpretation of findings from probability models are more complicated: because the models are non-linear, the results are generated in the form of odds-ratios and the absolute size of differences or impacts depend upon the values of all other variables in the model.

4.3 Organisation type

Table 3 presents the mean ICR and proportions of services in deficit, breakeven and surplus by organisation type. Private services have been divided into sole traders and limited companies or partnerships to capture the potential impacts of the differences in business structure and regulation.[37] Table 4 presents the statistical significance of differences across organisation type for the raw differences and the regression models.[38]

Table 3: Mean ICR and proportions of services in deficit, breakeven and surplus: organisation type

Organisation type	Mean ICR	Proportion of services in:			Number of services
		Deficit	Break-even	Surplus	
Sole trader	1.23	16%	36%	47%	255
Limited company/partnership	1.09	11%	59%	30%	108
Community	1.03	24%	50%	26%	166

Notes: The proportions across deficit, breakeven and surplus columns within each row sum to 100% (or approximately 100% due to rounding). The number of services does not sum to 534 due to missing data on organisation type.

[37] A sole trader is a business that is run by an individual who must register with Revenue as a self-employed person and is authorised to retain all profits once tax payment is complete. Sole traders are often the only employee in the business, but they can have employees once they are registered for employer PAYE. A partnership is similar to a sole trader in that it is a business with no legal entity but is run by two or more people. A limited company is a separate legal entity which is detached from the shareholders and directors and can be a private limited company (does not trade shares on public exchanges) or a public limited company (does trade shares). Limited companies must have at least one director (who must be on the payroll if taking a salary from the company).

[38] As the organisation characteristics have been combined into a single variable, there is no group model in this section.

Table 4: Statistically significant differences in the mean ICR: organisation type

	Raw differences	Complete model	Preferred model
Organisation type	sole trader > limited company/ partnership ***	sole trader > limited company/ partnership **	sole trader > limited company/ partnership ***
	sole trader > community ***	sole trader > community ***	sole trader > community ***
	limited company/ partnership > community **	limited company/ partnership > community **	limited company/ partnership > community **

Notes: *** / ** / * indicate statistical significance at the 99% / 95% / 90% levels respectively. The complete model includes all characteristics except urbanity, region and deprivation level. The preferred model includes all characteristics except urbanity, region and deprivation level and excludes the indicators for paid time for CPD and graduate led. See section 5.1 and Annex A for further details on the modelling.

Sole traders have a substantially higher mean ICR (1.23) than limited companies and partnerships (1.09) and community providers (1.03). The differences between all three types are statistically significant, both in the raw differences and in the regression models controlling for other related factors. This suggests that provider type in itself is an important driver of the rate of surplus and that sole traders, regardless of their other characteristics, have a substantially higher surplus rate than the other two organisation types, while community providers have the lowest surplus rate. Interestingly, sole traders have the lowest proportion in the breakeven group, indicating greater variation in the ICR than for the other two organisation types.

Given that community providers tend to be not-for-profit, the lower mean ICR for community providers is not surprising, but there are several possible reasons why sole traders have a higher surplus rate:

- The total cost measure includes a salary for sole traders, which means that the ICR for sole traders is calculated after this salary has been extracted. However, there may be some arbitrariness in how sole traders report this salary, which means it is lower (and the ICR correspondingly) higher than for comparable staff input for other types of organisation.
- The risks involved could be considered greater for sole traders, partly because of the lower likelihood of the ICR being in the breakeven range (as shown in table 4) and partly because sole traders do not have limited liability. If the business fails, sole traders are obliged to use personal income to cover debts or expenses incurred, while the liability for company members is limited to what they have invested in the company. Hence, a higher expected return for sole traders may be required to compensate for the greater financial risk.
- The higher ICR for sole traders would reflect higher tax liabilities on the surplus: while limited companies qualify for corporation tax at 12.5%, sole

traders can be taxed between the standard rate of 20% and 52% of their income.

- Sole traders may have lower costs than limited companies because set-up costs and ongoing regulatory requirements are lower.[39] In addition, delivery costs could be lower if sole traders are able to deliver provision more efficiently than other organisation types.

4.4 Service type

Table 5 presents the mean ICR and proportions of services in deficit, breakeven and surplus for the range of service type characteristics. Table 6 presents the statistical significance of differences across service types for the raw differences and the regression models.

Table 5: Mean ICR and proportions of services in deficit, breakeven and surplus: service type

Service type	Mean ICR	Proportion of services in:			Number of services
		Deficit	Break-even	Surplus	
Does not offer full day	1.17	19%	39%	42%	377
Offers full day	1.05	13%	62%	25%	157
No wrap-around care	1.16	20%	40%	40%	334
Wrap-around care	1.1	14%	55%	32%	200
Open exactly 38 weeks	1.19	19%	39%	42%	339
Open more than 38 weeks	1.05	15%	57%	28%	195
Age of youngest child:					
- under age two	1.04	15%	64%	22%	129
- age two	1.12	21%	38%	42%	72
- age three or four	1.18	18%	39%	43%	294
- school age	1.33	19%	33%	48%	21
No other services	1.14	18%	46%	37%	518
Other types of services	1.14	13%	50%	38%	16

Notes: The proportions across deficit, breakeven and surplus columns within each row sum to 100% (or approximately 100% due to rounding). The number of services do not always sum to 534 due to missing data on service type.

[39] Sole traders face much lower costs to register as a self-employed person than limited companies, which must be registered with the Companies Registration Office (CRO). Sole traders are responsible for keeping their own accounts (but end-of-year accounts are not made public), while limited companies must submit company accounts and reports to the CRO each year and face more demanding tax returns and higher accountancy fees.

Table 6: Statistically significant differences in the mean ICR: service type

Service type	Raw differences	Group model	Complete model	Preferred model
Full day care	no full day > full day ***	none	none	none
Wrap-around care	no wrap-around > wrap- around **	none	none	none
Annual opening	38 weeks > more than 38 weeks ***	38 weeks > more than 38 weeks ***	none	none
Age of youngest child	age 2 > under age 2 ** age 3 or 4 > under age 2 *** school age > under age 2 *	age 3 or 4 > under age 2 **	age 3 or 4 > under age 2 *	age 2 > under age 2 * age 3 or 4 > under age 2 ** school age > under age 2 *
Other services	none	none	other services > no other services **	other services > no other services ***

Notes: *** / ** / * indicate statistical significance at the 99% / 95% / 90% levels respectively. The group model includes all characteristics listed in the table. The complete model includes all characteristics except urbanity, region and deprivation level. The preferred model includes all characteristics except urbanity, region and deprivation level and excludes the indicators for paid time for CPD and graduate led. See section 5.1 and Annex A for further details on the modelling.

Services which do not offer full day or wrap-around care and are open exactly 38 weeks each year have a higher mean ICR than those which do offer full day or wrap-around care and are open for more than 38 weeks each year. The raw differences are statistically significant, but only the annual weeks is a statistically significant driver in the model with controls for other elements of service type. Moreover, none are statistically significant in the complete or preferred model, indicating that the higher ICRs are not due to the service type characteristic per se but because these types of services have other characteristics related to the ICR. Interestingly, the service types with higher mean ICRs are also those with the lowest proportions in the breakeven range, again suggesting a possible trade-off between the expected ICR and the risk.

The ICR varies substantially by the age of youngest child: the mean value is substantially lower (1.04) for providers with child under the age of two, while the small number of providers with a youngest child of school age have a mean ICR of 1.33. However, the only statistically significant differences are that the mean ICR

for services with children under the age of two is lower than the mean ICR for all three other categories.[40] These differences remain significant in the preferred regression model, indicating that the age of youngest child is a driver of differences in the ICR. Similar to other findings, the group with the lowest mean ICR is also the one with the highest proportion in the breakeven range.

The mean ICR is identical (1.14) for services which do and do not offer types of services other than ELC/SAC. However, in the complete and preferred regression models controlling for all other characteristics, those offering other types of services have a statistically significantly higher mean ICR. This indicates that, while offering other types of services is a driver of a higher ICR, services which have this broader service remit have other related characteristics which reduce the ICR.[41] These other characteristics offset the effects of offering other services so that impact cannot be seen in the raw differences.

4.5 Characteristics related to delivery cost

Table 7 presents the mean ICR and proportions of services in deficit, breakeven and surplus for the characteristics potentially related to delivery cost. Table 8 presents the statistical significance of differences across these characteristics for the raw differences and the regression models.

The mean ICR is very similar across the categories of premises type and there are no statistically significant raw differences. However, the ICR is statistically significantly higher for services with a formal lease than for services which own their premises in the complete model, but there is no significant difference in the preferred model.[42]

As would be expected, services with a high level of occupancy have a higher mean ICR (1.18) than the mean ICR (1.11) for other services. Somewhat surprisingly, while the raw differences are statistically significant, the differences are not significant in the regression models, indicating that the pattern for occupancy is driven by other related factors.

The mean ICR is lower for services with average group size in the middle group than for those with average group size in the low or high groups. Interestingly, the higher mean ICR for low group sizes over medium group sizes is statistically significant in the preferred regression model, suggesting that higher income for lower group sizes may outweigh the higher costs in determining the ICR.

[40] The absence of any significant difference for school-age children reflects that there are only 21 services in this category and small samples make it less likely that significant differences will be identified.

[41] Indeed, of the 16 services which offer other types of services, 14 are community providers, 12 offer full day care, 11 offer wrap-around care, 12 are open more than 38 weeks each year, 12 have children under the age of two, 13 are large in terms of number of childcare hours, 13 have income other than ECCE and 10 are in the low average staff qualification category.

[42] The preferred model has 18 additional observations due to the exclusion of paid CPD time and graduate led (for which 18 services had a missing value for at least one). The mean ICR for the 11 of these 18 additional observations which have the owned category of premises type is high (1.63), which explains why the statistically significant difference in the complete model is not present in the preferred model.

Table 7: Mean ICR and proportions of services in deficit, breakeven and surplus: characteristics related to cost

Characteristics potentially related to delivery cost	Mean ICR	Proportion of services in:			Number of services
		Deficit	Break-even	Surplus	
Occupancy:					
- low (<0.8)	1.11	18%	47%	35%	188
- medium (0.8 to 0.95)	1.11	18%	48%	34%	149
- high (>0.95)	1.18	16%	43%	41%	197
Average group size:					
- low (<12)	1.16	24%	38%	38%	164
- medium (12 to 17)	1.09	14%	53%	33%	180
- high (>17)	1.18	16%	42%	42%	172
Number of hours of ELC/SAC:					
- small (<15k)	1.23	21%	34%	45%	163
- medium (15k & <50k)	1.13	19%	43%	37%	182
- large (50k plus)	1.06	12%	58%	30%	189
Single site	1.14	18%	46%	37%	489
Multisite (part of chain)	1.07	13%	47%	40%	45
Staff benefits:					
- none	1.17	19%	40%	40%	324
- only sick pay	1.11	11%	55%	34%	132
- mix of pensions, sick pay or top-up maternity leave pay	1.06	22%	51%	27%	78
Premises type:					
- owned	1.15	19%	42%	38%	234
- formal lease	1.13	14%	46%	39%	173
- neither owned nor formal lease	1.14	18%	50%	32%	111

Notes: The proportions across deficit, breakeven and surplus columns within each row sum to 100% (or approximately 100% due to rounding). The number of services do not always sum to 534 due to missing data on the characteristics potentially related to delivery cost.

Table 8: Statistically significant differences in the mean ICR: factors related to cost

Factor related to cost	Raw differences	Group model	Complete model	Preferred model
Occupancy	high > low * high > medium **	none	none	none
Average group size	low > medium * high > medium ***	none	none	low > medium *
Number of hours of ELC/SAC	low > medium ** low > high *** medium > high ***	low > medium * low > high *** medium > high *	none	none
Multisite (chain)	single site > multisite **	none	none	none
Staff benefits	none > only sick pay * none > mix *** only sick pay > mix *	none > mix **	none	none
Premises type	none	none	formal lease > owned **	none

Notes: *** / ** / * indicate statistical significance at the 99% / 95% / 90% levels respectively. The group model includes all characteristics listed in the table. The complete model includes all characteristics except urbanity, region and deprivation level. The preferred model includes all characteristics except urbanity, region and deprivation level and excludes the indicators for paid time for CPD and graduate led. See section 5.1 and Annex A for further details on the modelling.

The pattern for number of hours of ELC/SAC is quite surprising: small services have a statistically significantly higher mean ICR than medium or large ones, and medium ones have a statistically significantly higher mean ICR than large ones (even when controlling for other characteristics related to cost in the group model). However, there are no statistically significant differences in the complete or preferred models which control for all characteristics. The reason for this is most likely that the number of hours of ELC/SAC is an annual total and will reflect the service type characteristics of offering full day and wrap-around care and being open for more than 38 weeks each year. They will also reflect the size of the service, including whether the service is a sole trader. Controlling for these other factors indicates that the number of ELC/SAC hours is not a direct driver of the ICR.

The mean ICR for single-site providers (1.14) is statistically significantly higher than that for multisite providers (1.07). However, the difference is not statistically significant in any of the regression models, indicating that multisite is not a driver in itself. The raw difference is partly explained by the fact that all sole traders (which have a substantially higher ICR) are single site.[43]

As would be expected, services which do not offer any staff benefits have a higher mean ICR (1.17) than those which offer only sick pay (1.11) or a different mix of pension, sick pay and top-up maternity leave pay (1.06). The raw differences are statistically significant, but the differences are not significant in the complete or preferred regression models, indicating that staff benefits are not a direct driver of the ICR.[44]

4.6 Government funding

Table 9 presents the mean ICR and proportions of services in deficit, breakeven and surplus for the government funding characteristics. Table 10 presents the statistical significance of differences across these characteristics for the raw differences and the regression models.

Table 9: Mean ICR and proportions of services in deficit, breakeven and surplus: government funding

Government funding	Mean ICR	Proportion of services in:			Number of services
		Deficit	Break-even	Surplus	
ECCE and other income	1.11	17%	50%	33%	334
Only ECCE income	1.19	18%	39%	44%	200
No ECCE higher capitation	1.15	21%	43%	35%	279
ECCE higher capitation	1.12	13%	48%	38%	255

Notes: The proportions across deficit, breakeven and surplus columns within each row sum to 100% (or approximately 100% due to rounding).

[43] Allowing for organisation type was sufficient alone to explain the higher ICR for single-site providers but allowing for all other characteristics other than organisation type was also sufficient to explain the higher ICR for single-site settings. This indicates that while all sole traders being single site is part of the explanation for the higher mean ICR for single-site settings, other factors are also part of the explanation.

[44] Interestingly, there is no strong correlation between staff benefits and the average staff qualification which might explain this: the average staff qualification is 6.24 for services with no benefits, 6.19 for services with only sick pay and 6.17 for services with another mix of benefits.

Table 10: Statistically significant differences in the mean ICR: government funding

Government funding	Raw differences	Group model	Complete model	Preferred model
ECCE only income	ECCE only > other income sources	ECCE only > other income sources	none	none
ECCE higher capitation	none	none	higher capitation > no higher capitation **	none

Notes: *** / ** / * indicate statistical significance at the 99% / 95% / 90% levels respectively. The group model includes all characteristics listed in the table. The complete model includes all characteristics except urbanity, region and deprivation level. The preferred model includes all characteristics except urbanity, region and deprivation level and excludes the indicators for paid time for CPD and graduate led. See section 5.1 and Annex A for further details on the modelling.

Services which only receive income from ECCE funding have a higher mean ICR (1.19) than the mean ICR (1.11) for those which have other income from other sources. Although the raw difference is statistically significant, the difference is not significant in the complete or preferred regression models, indicating that having income sources other than ECCE funding are not a driver of the ICR.

In contrast, there are no significant differences in the mean ICR between services which receive the higher capitation rate for ECCE funding and those which do not. Although those with higher capitation rates do have a higher ICR than those without in the complete model, there is no statistically significant difference in the preferred model.[45]

4.7 Quality

Table 11 presents the mean ICR and proportions of services in deficit, breakeven and surplus for the quality measures. Table 12 presents the statistical significance of differences across these characteristics for the raw differences and the regression models.

The mean ICRs for services with and without paid CPD are very close and there are no statistically significant differences for the raw differences or in the group or complete regression models. There is the same pattern for services with and without graduate leadership. For this reason, both characteristics were excluded from the preferred model, with the conclusion that these two characteristics are not related to the ICR in any way. This finding is not surprising: the additional costs are relatively minor (paid CPD time is an occasional expense and having a graduate leader may only impact on cost for one staff member) and paid CPD time or graduate leadership are not usually seen as reasons for higher income.

[45] There is a high level of correlation between being graduate led and receiving the higher capitation rate, as would be expected. Graduate led with a negative (but insignificant) coefficient in the complete model and its exclusion from the preferred model may explain why the coefficient on higher capitation changes from being positive and significant in the complete model to being much smaller and insignificant in the preferred model.

Table 11: Mean ICR and proportions of services in deficit, breakeven and surplus: quality measures

Quality measures	Mean ICR	Proportion of services in:			Number of services
		Deficit	Break-even	Surplus	
No paid time for CPD	1.13	19%	45%	36%	346
Paid time for CPD	1.11	14%	50%	36%	168
Not graduate led	1.15	20%	42%	38%	214
Graduate led	1.13	16%	48%	36%	320
Average staff qualification level:					
- low (<6)	1.10	16%	50%	34%	165
- medium (6 to 6.5)	1.18	18%	39%	43%	235
- high (>6.5)	1.12	18%	52%	30%	133

Notes: The proportions across deficit, breakeven and surplus columns within each row sum to 100% (or approximately 100% due to rounding). The number of services do not always sum to 534 due to missing data for the quality measures.

Table 12: Statistically significant differences in the mean ICR: quality measures

Quality measures	Raw differences	Group model	Complete model	Preferred model
Paid CPD time	none	none	none	excluded
Graduate led	none	none	none	excluded
Average staff qualifications	medium > low ***	medium > low ** medium > high **	medium > high ***	medium > low * medium > high *

Notes: *** / ** / * indicate statistical significance at the 99% / 95% / 90% levels respectively. The group model includes all characteristics listed in the table. The complete model includes all characteristics except urbanity, region and deprivation level. The preferred model includes all characteristics except urbanity, region and deprivation level and excludes the indicators for paid time for CPD and graduate led. See section 5.1 and Annex A for further details on the modelling.

In contrast, the average staff qualification level does have statistically significant relationships with the ICR, both in the raw differences and in the regression models. The mean ICR is substantially higher for the middle average qualification group (1.18) than for both the low group (1.10) and the high group (1.12). The highest mean ICR for the middle group may be explained by different dynamics for the delivery cost and income: raising qualifications from the low to the middle

category may increase income sources (from parents and government) to a relatively greater extent than the increase in delivery cost due to the need for higher staff salaries to pay more qualified staff, while raising qualifications from the middle to high group may have greater impacts on delivery costs than income.

4.8 Geographic area

Table 13 presents the mean ICR and proportions of services in deficit, breakeven and surplus for the geographic area characteristics. Tests of the statistical significance of differences across these characteristics were not available.

Table 13: Mean ICR and proportions of services in deficit, breakeven and surplus: geographic area

Geographic area	Mean ICR	Proportion of services in:			Number of services
		Deficit	Break-even	Surplus	
Urban	1.13	17%	47%	36%	310
Rural	1.15	18%	44%	38%	223
Region:					
- border	1.12	21%	49%	30%	43
- Dublin	1.12	18%	49%	33%	133
- mid-east	1.14	23%	41%	36%	83
- mid-west	1.18	11%	44%	45%	62
- midlands	1.20	9%	47%	44%	32
- south-east	1.13	19%	35%	46%	48
- south-west	1.14	17%	49%	34%	77
- west	1.11	16%	48%	36%	56
Deprivation index:					
- affluent	1.13	18%	51%	31%	39
- marginally above average	1.15	19%	46%	36%	232
- marginally below average	1.13	16%	44%	40%	225
- disadvantaged	1.09	17%	50%	33%	36

Source: Additional statistics provided by Crowe/Apteilegen.

Notes: The proportions across deficit, breakeven and surplus columns within each row sum to 100% (or approximately 100% due to rounding). The number of services do not always sum to 534 due to missing data for geographic area. Additional statistics were provided by Crowe/Apteilegen because the geographic variables could not be shared to ensure that individual services could not be identified.

The mean ICR is slightly higher for services in rural areas than in urban areas, but the difference is small and the proportions in deficit, breakeven and surplus

are similar. The mean ICRs for services in the mid-west and midlands are both notably higher than those for all other regions, and the proportions in deficit are also notably lower in these two regions than in all other regions. However, the number of services in the sample in these two regions is quite low and no strong conclusion should be drawn from this regional pattern. The mean ICR for services in disadvantaged areas is notably lower than the mean ICRs for services in the three other categories of affluence although, again, this difference is based on a small number of services (36) in the disadvantaged category and no strong conclusion can be drawn from this.[46]

[46] The small subsample sizes mean that tests of statistical significance are unlikely to identify that the differences are statistically significant, but it is possible the differences could be statistically significant.

5. Profile of Services in Deficit, Breakeven and Surplus

This chapter presents the profiles of the characteristics of services which are in deficit, in breakeven and in surplus. The first section explains how to interpret the profile tables, while the remaining six sections present the profiles in terms of organisation type, service type, characteristics potentially related to delivery cost, government funding, quality measures and geographic area.

5.1 Interpreting the profile tables

In each profile table presented below, the cell columns sum to 100%, showing the breakdown of providers in deficit, breakeven and surplus across the characteristic under consideration. The profiles for providers in deficit and in surplus are discussed, but the profile for the breakeven group highlights whether providers in these two extreme categories are substantially different from all providers.

5.2 Organisation type

Table 14 presents the profiles for organisation type. As only private providers can be sole traders, the private/community and sole trader indicators have been combined into three mutually exclusive categories as shown in the table.

Very few services (13%) in deficit are limited companies or partnerships, while the remainder are split between sole traders (44%) and community services (43%). In contrast, most (62%) of the services in surplus are sole traders, while smaller proportions are limited companies or partnerships (16%) and community services (22%).

Table 14: Profile of services in deficit, breakeven and surplus: organisation type

Organisation type	Services in deficit	Services in breakeven	Services in surplus
Sole trader	44%	39%	62%
Limited company/partnership	13%	27%	16%
Community	43%	35%	22%
Total	100%	100%	100%

Notes: Sample sizes are 93 for providers in deficit, 244 for providers in breakeven and 197 for providers in surplus. The columns within each cell sum to 100% (or approximately 100% due to rounding).

5.3 Service type

Table 15 presents the profiles for service type characteristics. As these characteristics tend to be closely related, the bottom panel of the table presents

the most common combinations (defined as those where the combination constitutes 5% or more for any of the three profiles).

Table 15: Profile of services in deficit, breakeven and surplus: service type

Service type	Services in deficit	Services in breakeven	Services in surplus
Does not offer full day	78%	60%	80%
Offers full day	22%	40%	20%
No wrap-around care	71%	55%	68%
Wrap-around care	29%	45%	32%
Open exactly 38 weeks	68%	55%	73%
Open more than 38 weeks	32%	45%	27%
Age of youngest child:			
- under age two	21%	35%	15%
- age two	16%	12%	16%
- age three or four	58%	50%	65%
- school age	4%	3%	5%
Does not offer other services	98%	97%	97%
Offers other types of services	2%	3%	3%
Most common combinations:			
No full day, no wrap-around, 38 weeks			
- youngest aged 3 or four	47%	37%	51%
- youngest aged 2	8%	4%	6%
Youngest aged under two, full day, holidays			
- wrap-around	7%	22%	9%
- no wrap-around	5%	6%	3%
Wrap-around, no full day, 38 weeks			
- youngest aged 3 or four	3%	6%	6%
- youngest aged 4	4%	3%	5%

Notes: Sample sizes are 93 for providers in deficit, 244 for providers in breakeven and 197 for providers in surplus. The columns within each cell sum to 100% (or approximately 100% due to rounding).

Most (78%) services in deficit do not offer full day provision, most (71%) do not offer wrap-around care and just over two-thirds (68%) are open for exactly 38 weeks each year. The majority (58%) have a youngest child aged three or four and almost none (2%) offer other types of services. In combination, 47% of services in deficit have all these service type characteristics.

However, services in surplus have a very similar (and slightly stronger) profile: 80% do not offer full day provision, 68% do not offer wrap-around care, 73% are open for exactly 38 weeks each year, 65% have a youngest child aged three or four and only 3% offer other types of services. In combination, 51% of services in surplus have all these service type characteristics.

Interestingly, it is services in breakeven which have a slightly different profile: closer to half offer full day care and wrap-around care and are open more than 38 weeks, while more than a third offer care for children under age two. Although the same combination is the most common for services in deficit and in surplus (reflecting the dominant profile for all services), some 28% have an alternative combination of offering full day care, operating for more than 38 weeks and catering for children under the age of two.

5.4 Characteristics related to delivery cost

Table 16 presents the profiles for characteristics potentially related to cost.

The first three characteristics in table 16 (occupancy, average group size and number of hours of ELC/SAC) contain categories specifically defined to split the sample into three roughly equal sized categories. However, a slightly higher proportion of services in deficit are in the low average group size category and a slightly lower proportion are in the large group for number of hours of ELC/SAC. A slightly higher proportion of services in surplus are in the high occupancy group.

Almost all (94%) services in deficit are single site, two-thirds (67%) do not offer any staff benefits and half (50%) own their premises. The profile for services in surplus is very similar: 91% are single site, 66% do not offer any staff benefits and 47% own their own premises.

Table 16: Profile of services in deficit, breakeven and surplus: characteristics related to cost

Characteristic potentially related to delivery cost	Services in deficit	Services in breakeven	Services in surplus
Occupancy:			
- low (<0.8)	37%	36%	34%
- medium (0.8 to 0.95)	29%	29%	26%
- high (>0.95)	34%	35%	41%
Average group size:			
- low (<12)	43%	27%	32%
- medium (12 to 17)	27%	41%	31%
- high (>17)	30%	31%	37%
Number of hours of ELC/SAC:			
- small (<15k)	38%	23%	37%
- medium (15k & <50k)	38%	32%	35%
- large (50k plus)	25%	45%	28%
Single site	94%	91%	91%
Multisite (part of chain)	6%	9%	9%
Staff benefits:			
- none	67%	54%	66%
- only sick pay	15%	30%	23%
- mix of pensions, sick pay or top-up maternity leave pay	18%	16%	11%
Premises type:			
- owned	50%	42%	47%
- formal lease	28%	34%	35%
- neither owned nor formal lease	22%	24%	18%

Notes: Sample sizes are 93 for providers in deficit, 244 for providers in breakeven and 197 for providers in surplus. The columns within each cell sum to 100% (or approximately 100% due to rounding).

5.5 Government funding

Table 17 presents the profiles for the government funding characteristics. The bottom panel of the table presents the combinations of ECCE only funding and higher capitation rates for ECCE.

Table 17: Profile of services in deficit, breakeven and surplus: government funding

Government funding	Services in deficit	Services in breakeven	Services in surplus
ECCE income and other income	62%	68%	55%
Only ECCE income	38%	32%	45%
No higher capitation for ECCE	63%	50%	50%
Higher capitation for ECCE	37%	50%	50%
Combinations:			
- other income, no higher capitation	40%	30%	23%
- other income, higher capitation	23%	38%	32%
- ECCE only, no higher capitation	24%	19%	27%
- ECCE only, higher capitation	14%	12%	18%

Notes: Sample sizes are 93 for providers in deficit, 244 for providers in breakeven and 197 for providers in surplus. The columns within each cell sum to 100% (or approximately 100% due to rounding).

Just under two-thirds (62%) of services in deficit have income from sources[47] other than ECCE funding and a similar proportion (63%) do not receive the higher capitation rate for ECCE funding. Some 40% both receive income from sources other than ECCE funding and have no higher capitation rate.

Just over half (55%) of services in surplus have income from sources other than ECCE funding and exactly half (50%) do not receive the higher capitation rate for ECCE funding. The most common combination (32%) receive income from sources other than ECCE funding but do receive the higher capitation rate for ECCE funding.

5.6 Quality measures

Table 18 presents the profiles for quality measures. As these characteristics tend to be closely related, the bottom panel of the table again presents the most common combinations (this time defined as those where the combination constitutes 10% or more for any of the three profiles).

Just under three-quarters (73%) of services in deficit do not have paid CPD time, but over half (55%) are graduate led[48] and 46% have an average staff qualification level in the middle category.[49] The most common combinations are low average

[47] Other income can include DCEDIY funding, parental fees and other sources.

[48] Services in deficit tend to not receive the higher ECCE capitation rate but also tend to be graduate led. This reflects the profile for all services: 52% do not receive the higher capitation and 60% are graduate led: 72 of the 534 services are graduate led but do not receive ECCE higher capitation.

[49] Rather than evenly dividing the sample, the cut-offs for the groups for average staff qualification level reflected distinct breaks in the distribution: 31% of all services in the low group, 44% in the medium group and 25% in the high group.

qualifications and not graduate led and medium or high average qualifications and graduate led (and no paid CPD in all three cases).

The profile for services in surplus is quite similar: 68% of services in surplus do not have paid CPD time, 58% are graduate led and 51% have an average staff qualification level in the middle category. The most common combinations are low and medium average qualifications and not graduate led and medium average qualifications and graduate led (and no paid CPD in all three cases).

Table 18: Profile of services in deficit, breakeven and surplus: quality measures

Quality measures	Services in deficit	Services in breakeven	Services in surplus
No paid time for CPD	73%	65%	68%
Paid time for CPD	27%	35%	32%
Not graduate led	45%	37%	42%
Graduate led	55%	63%	58%
Average staff qualification level:			
- low (<6)	28%	34%	28%
- medium (6 to 6.5)	46%	38%	51%
- high (>6.5)	26%	28%	20%
Most common combinations:			
Low average qualifications:			
- no paid CPD, not graduate led	20%	16%	15%
Medium average qualifications:			
- no paid CPD, not graduate led	12%	8%	17%
- no paid CPD, graduate led	17%	17%	20%
- paid CPD, graduate led	8%	9%	12%
High average qualifications:			
- no paid CPD, graduate led	18%	18%	11%
- paid CPD, graduate led	7%	10%	7%

Notes: Sample sizes are 93 for providers in deficit, 244 for providers in breakeven and 197 for providers in surplus. The columns within each cell sum to 100% (or approximately 100% due to rounding).

5.7 Geographic area

Table 19 presents the profiles for local geographic characteristics. Just over half (56%) of services in deficit are located in urban areas, while over a quarter (26%) are in the Dublin region and a fifth (20%) in the mid-east region. Almost half (46%) of these services are in areas which are slightly above average in terms of affluence, while most of the remainder (a further 40%) are in areas marginally below average in terms of affluence.

The profile of services in surplus is very similar for urbanity and deprivation. For region, slightly lower proportions of services in surplus are in the Dublin and mid-east regions, while slightly higher proportions are in the mid-west and midlands regions than the proportions for services in deficit.

Table 19: Profile of services in deficit, breakeven and surplus: geographic area

Geographic area	Services in deficit	Services in breakeven	Services in surplus
Urban	56%	60%	57%
Rural	44%	40%	43%
Region:			
- border	10%	9%	7%
- Dublin	26%	27%	22%
- mid-east	20%	14%	15%
- mid-west	8%	11%	14%
- midlands	3%	6%	7%
- south-east	10%	7%	11%
- south-west	14%	16%	13%
- west	10%	11%	10%
Deprivation index:			
- affluent	8%	8%	6%
- marginally above average	46%	44%	42%
- marginally below average	40%	41%	45%
- disadvantaged	6%	7%	6%

Source: Additional statistics provided by Crowe/Apteilegen.

Notes: Sample sizes are 93 for providers in deficit, 244 for providers in breakeven and 197 for providers in surplus. The columns within each cell sum to 100% (or approximately 100% due to rounding). Additional analysis was provided by Crowe/Apteilegen because the geographic variables could not be shared to ensure that individual services could not be identified

6. Summary and Discussion

This chapter discusses the findings. The first section summarises the findings and the second considers their robustness. The third section compares the findings with other research on the ICR for ELC/SAC services, while the final section considers some implications of the findings.

6.1 Summary of findings

The mean value of the ICR in the survey data is 1.14 and the median value is 1.04, indicating that the distribution is right-skewed with a longer tail towards higher values. A substantial proportion of the sample are clustered around and just above the breakeven point of an ICR of one: 53% have an ICR within the range of 0.95 to 1.15.

Some types of services have a higher mean ICR, indicating that provision generates a higher rate of surplus for these services:

- Regarding organisation type, the mean ICR is higher for private sole traders than private limited companies or partnerships and community services and is higher for private limited companies or partnerships than community services.
- Regarding service type, the mean ICR is higher for services which do not offer full day or wrap-around care, are open exactly 38 weeks each year (rather than more than 38 weeks) and do not have any children under the age of two.
- Regarding factors which may drive the cost part of the ICR, the mean ICR is higher for services with high occupancy, medium (rather than low or high) levels of average group size and low total numbers of ELC/SAC hours. The mean ICR is also higher for services which are single site (rather than multisite) and which do not pay staff benefits.
- Regarding government funding, the mean ICR is higher for services whose only income source is ECCE funding.
- Regarding quality measures, the mean ICR is higher for services with medium (rather than low or high) levels of staff qualifications.

These findings do not indicate that these characteristics directly drive the higher ICR, only that, for whatever reason, these kinds of services tend to have higher ICRs. Indeed, many of these characteristics tend to overlap and some services will have similar bundles all associated with a higher ICR.

Estimations of regression models allow the key driving characteristics in these bundles to be identified by controlling for the mix of characteristics of services which have higher ICRs. This analysis suggests that there are a small number of direct drivers of the ICR which underpin the patterns across different types of services.[50] These key drivers are:

[50] Average group size is not included as a key driver because it was on the border of statistical significance in the preferred model (a p-value of exactly 0.100) and was not statistically significant in the complete model.

- Being a sole trader is associated with a higher ICR than being a limited company or partnership or a community provider, while being a limited company or partnership is associated with a higher ICR than being a community provider. Given that community providers tend to be specifically not-for-profit, the association with the lowest rate of surplus is not surprising. There are several possible reasons why sole traders appear to have a higher rate of surplus than limited companies, including differences in how staff salary is measured; compensation for greater financial risk; compensation for higher tax liabilities; and lower delivery costs due to less regulatory burden or greater efficiency in delivery.
- Having no children under the age of two is associated with a higher ICR than having a child under age two. Given that younger children have higher delivery costs due to the need for higher levels of staffing, a lower surplus rate for services catering for the youngest group is not surprising.
- Offering types of services other than ELC/SAC is associated with a higher ICR. This may be due to economies of scale reducing delivery costs or could arise from higher income from parents or government for the broader range of services.
- Having average staff qualifications at the middle level is associated with a higher ICR than having low or high average qualifications. The highest mean ICR for the middle group may be explained by different dynamics for the delivery cost and income: raising qualifications from the low to the middle category may increase income sources (from parents and government) to a relatively greater extent than the increase in delivery cost due to the need for higher staff salaries to pay more qualified staff, while raising qualifications from the middle to high group may have greater impacts on delivery costs than income.

This suggests that, although other types of services (those not offering full day or wrap-around care; those open exactly 38 weeks each year; those with high occupancy, medium levels of average group size or low total numbers of childcare hours; single-site services; those not paying staff benefits; and those whose only income source is ECCE funding) have higher levels of ICR, this is only because they also have one or more of the key drivers.[51]

Services were classified into three groups of being in deficit (ICR less than or equal to 0.950), breakeven (ICR greater than 0.95 and less than 1.1) and surplus (ICR equal to 1.1 or greater). Some 17% of the sample were in deficit, 46% in breakeven and 37% in surplus. The characteristics for services in deficit are broadly similar to those for services in breakeven and in surplus, indicating that services in deficit and surplus do not have distinctive profiles from all services. Although this suggests that the likelihood of being in deficit, breakeven or surplus does not vary substantially across service types, the analysis of the mean ICR showed that there

[51] For occupancy, average group size, single site and ECCE as the only income source, allowing for organisation type was sufficient alone to explain the higher ICR, but (with the exception of average group size), allowing for all other characteristics other than organisation type was also sufficient to explain the higher ICR. This indicates that while the higher proportions of sole traders in the categories with higher ICR for these characteristics are part of the explanation for the differences in the mean ICR, other key drivers are also part of the explanation.

are important variations across service types which are not captured in the three broad groups defined as deficit, breakeven and surplus.

6.2 Robustness of findings

These findings are robust to the extent that they are drawn from a large representative sample (the profile of the sample was reasonably matched with the population of services for a number of key characteristics as shown in the Crowe/Apteilegen Cost Report[52]) and the relationships have been thoroughly tested. However, there are some caveats to the findings:

- The sample size for the data is reasonable, but not large. Hence, some associations between the ICR and the characteristics may not have been identified, particularly where the associations are weaker.
- It was not possible to include the geographical area characteristics (urbanity, region and deprivation) in the regression analysis and the effects their inclusion might have cannot be estimated.
- It has been assumed that the service characteristics drive the ICR. It is possible that causation could be in the other direction, that is, having a higher surplus rate allows providers to make certain delivery choices.
- The data was collected prior to the current Covid pandemic and it is possible that the pandemic and associated lockdown may have affected the levels of surplus and patterns in the surplus rate.

6.3 Comparisons with other research

The findings can be compared with analysis of the ICR for ELC settings in England[53] using a similar data set collected at around the same time as the data used here.

Comparisons with the analysis for England must be treated with a high degree of caution as the sector has a fundamentally different structure (there is substantial public provision and childminders are included in the analysis[54]) and the regression models contained a very different set of characteristics. Nevertheless, some comparisons can be drawn:

- As in Ireland, private providers have a higher ICR than community (voluntary) providers (although the difference is not statistically significant in models with controls for related factors).
- In contrast to Ireland, full day care has a higher ICR than providers offering only sessional care (although the difference is not statistically significant in models with controls for related factors).

[52] Crowe/Apteilegen (2020), *Review of the Cost of Providing Quality Childcare Services in Ireland*, Department of Children and Youth Affairs, March https://www.gov.ie/en/publication/1fbfe-crowe-report-review-of-the-cost-of-providing-quality-childcare-services-in-ireland-march-2020/

[53] Cattoretti, G., Paull, G. and Marshall, L., (2019), *Providers' Finances: Evidence from the Survey of Childcare and Early Years Providers 2018*, Department for Education Research Report DFE-RR896, March https://www.gov.uk/government/publications/provider-finances-evidence-from-early-years-providers

[54] In addition, the analysis for England does not consider services which only offer school-age childcare without any provision for younger children.

- In contrast to Ireland, a middle level of annual opening weeks (40 to 48) is associated with a higher ICR than the low level of fewer than 40 weeks.[55]
- As in Ireland, having no children under age two is associated with a higher ICR.
- In contrast to Ireland, providers delivering additional specialist child services have a higher ICR, but this delivery is not a driver of a higher ICR.[56]
- In contrast to Ireland, being of medium or large size is associated with a higher ICR. However, the measurement of size in England is capacity at a point in time, while the size measure used for Ireland conflates opening hours and weeks with capacity at a point in time. In addition, the analysis for England includes childminders in the small group.
- As in Ireland, greater government funding is associated with a higher ICR (although this is identified only for two of the four policy measures).
- In contrast to Ireland, average highest staff qualification has no association with the ICR.
- As in Ireland, providers in urban areas have a higher ICR than those in rural areas.
- Similarly to Ireland, providers in the second most-deprived areas (slightly lower than average affluence) have the highest ICR.

6.4 Implications

This analysis has shown that the rate of surplus varies across different types of ELC/SAC services. However, very little is known about how this surplus is used and the consequences of this variation despite increasing levels of public funding being spent in this sector. The collection of robust data on the use of any surplus faces formidable challenges in obtaining financially sensitive information from providers in a competitive market sector. While public discussion focuses on the need for a surplus to maintain, improve and expand services, there is the possibility that some surplus may accrue to service owners at above-normal levels of investment returns.

[55] This differences is not directly driven by the ECCE being a 38-week programme because England also has free hours for 38 weeks each year (although these can be and sometimes are spread over 52 weeks).

[56] In Ireland, the mean ICR for providers delivering other services is no different from those not delivering other services because delivering other services is a driver of a higher ICR which is offset by other characteristics of these services. In England, providers delivering other services have a higher ICR only because of their other characteristics and not because of the other services per se.

Annex A: Regression Analysis

This annex presents the regression analysis results which underly the findings presented in chapter 5.

The regression analysis followed several steps:

- The statistical significance of differences was tested for each individual characteristic and for group models containing all characteristics within the groups of organisation type, service type, characteristics related to cost, government funding and quality measures. A complete model containing all characteristics was also estimated.
- Two characteristics which were not significant in any of the models (indicators for paid CPD and graduate led) were excluded from the complete model. Subsequent variants of this model were then estimated sequentially, excluding characteristics which had only been significant in the raw differences (full day, wrap-around care, occupancy and multisite); which had only been significant in the raw differences and group models (open more than 38 weeks, total number of ELC/SAC hours, staff benefits and ECCE only income) and which were no longer significant among the remaining characteristics (group size, premises type and higher ECCE capitation). The final, most constrained model contained organisation type, age of youngest child, other services and average staff qualification.
- The preferred model (the complete model with indicators for paid CPD and graduate led excluded) was selected as the one with the maximum explanatory power in the form of the highest R-squared.
- Tests for multicollinearity indicated that there were no high levels of multicollinearity in any of the models.

Other variants of the model which did not improve the R-squared value or have any qualitative impact on the results were also tested:

- Various combinations of full day, age of youngest child and group size were tested as there were low levels of multicollinearity between these three characteristics.
- Linear specifications (with and without quadratic terms) for occupancy, group size and average staff qualification were tested but these were poorer specifications than the discrete categories.

In order to understand the role of organisation type (particularly sole traders), further regression models were estimated for the characteristics with statistically significant raw differences in the ICR across categories which were absent in the preferred model:

- The addition of organisation type to the raw difference tests to identify whether organisation type alone explained the raw differences.
- Estimation of the preferred model without organisation type to identify whether a combination of other factors could explain the raw differences.

The combination of raw differences and the grouped, complete and preferred regression models were presented as best capturing all the drivers of the ICR with varying degrees of controls. The results from the complete and preferred regression models are presented in table 20.

The R^2 values (a measure of how well the variation explained by the characteristics) is quite high in both models (0.129 for the complete model and 0.134 for the preferred model). In the comparable work for England, the preferred model had an R^2 value of 0.08.

Table 20: Results for regression models

Dependent variable: ICR	Complete model		Preferred model	
Explanatory variables:	Coefficient	(Standard error)	Coefficient	(Standard error)
Sole trader	omitted		omitted	
Limited company/partnership	-0.099**	(0.042)	-0.114***	(0.042)
Community	-0.180***	(0.031)	-0.205***	(0.036)
Does not offer full day	omitted		omitted	
Offers full day	0.043	(0.050)	0.061	(0.050)
No wrap-around care	omitted		omitted	
Wrap-around care	0.003	(0.032)	0.012	(0.036)
Open exactly 38 weeks	omitted		omitted	
Open more than 38 weeks	-0.033	(0.042)	-0.048	(0.044)
Age of youngest child:				
- under age two	omitted		omitted	
- age two	0.077	(0.049)	0.091*	(0.049)
- age three or four	0.084*	(0.047)	0.099**	(0.047)
- school age	0.218	(0.140)	0.335*	(0.175)
No other services	omitted		omitted	
Other types of services	0.171**	(0.071)	0.174***	(0.066)
Occupancy:				
- low (<0.8)	omitted		omitted	
- medium (0.8 to 0.95)	-0.008	(0.032)	-0.007	(0.034)
- high (>0.95)	0.022	(0.032)	0.020	(0.035)
Average group size:				
- low (<12)	omitted		omitted	
- medium (12 to 17)	-0.044	(0.033)	-0.056*	(0.034)
- high (>17)	0.006	(0.047)	-0.024	(0.049)
Number of hours of ELC/SAC:				
- small (<15k)	omitted		omitted	
- medium (15k & <50k)	0.001	(0.045)	-0.050	(0.050)
- large (50k plus)	-0.017	(0.054)	-0.056	(0.062)

Dependent variable: ICR	Complete model		Preferred model	
Explanatory variables:	Coefficient	(Standard error)	Coefficient	(Standard error)
Single site	omitted		omitted	
Multisite (part of chain)	-0.026	(0.043)	-0.031	(0.044)
Staff benefits:				
- none	omitted		omitted	
- only sick pay	0.016	(0.027)	0.003	(0.028)
- other mix	-0.029	(0.031)	-0.043	(0.032)
Premises type:				
- owned	omitted		omitted	
- formal lease	0.063**	(0.032)	0.052	(0.032)
- neither owned nor formal lease	0.036	(0.037)	0.043	(0.047)
ECCE and other income	omitted		omitted	
Only ECCE income	-0.027	(0.049)	-0.037	(0.051)
No ECCE higher capitation	omitted		omitted	
ECCE higher capitation	0.081**	(0.034)	0.006	(0.037)
No paid time for CPD	omitted		excluded	
Paid time for CPD	0.013	(0.028)		
Not graduate led	omitted		excluded	
Graduate led	-0.062	(0.044)		
Average staff qualification level:				
- low (<6)	omitted		omitted	
- medium (6 to 6.5)	0.051	(0.040)	0.059*	(0.034)
- high (>6.5)	-0.056	(0.043)	-0.018	(0.046)
Constant	1.114***	(0.082)	1.167***	(0.083)
Number of observations	481		499	
R-squared	0.129		0.134	

Notes: *** / ** / * indicate statistical significance at the 99% / 95% / 90% levels respectively. The coefficients for private limited company and partnership and community are statistically significantly different at the 95% level in both models. The coefficients on medium and high average staff qualifications are statistically significantly different at the 99% level in the complete model and at the 90% level in the preferred model. No other pairs of coefficients were statistically significantly different.

Annex B: Sample Statistics for Cost, Income and Surplus

Table 21 presents the sample mean values for total cost, total income, total absolute surplus and the ICR across each of the service characteristics.

Table 21: Mean total cost, total income, total surplus and ICR: organisation and service types

Characteristic	Number of services	Sample means			
		Total annual cost	Total annual income	Total absolute surplus	ICR
Sole trader	255	€73,224	€82,109	€8,886	1.23
Limited company/ partnership	108	€253,945	€267,376	€13,431	1.09
Community	166	€192,462	€196,730	€4,268	1.03
Does not offer full day	377	€65,983	€71,781	€5,799	1.17
Offers full day	157	€348,220	€362,539	€14,319	1.05
No wrap-around care	334	€87,910	€94,267	€6,356	1.16
Wrap-around care	200	€250,919	€262,476	€11,556	1.1
Open exactly 38 weeks	339	€64,740	€71,335	€6,595	1.19
Open more than 38 weeks	195	€295,381	€306,655	€11,274	1.05
Age of youngest child:					
- under age two	129	€368,913	€381,408	€12,494	1.04
- age two	72	€119,430	€127,255	€7,824	1.12
- age three or four	294	€65,249	€71,923	€6,674	1.18
- school age	21	€73,051	€79,334	€6,283	1.33
No other services	518	€143,191	€151,407	€8,216	1.14
Other types of services	16	€335,826	€346,967	€11,141	1.14
Occupancy:					
- low (<0.8)	188	€149,275	€157,506	€8,231	1.11
- medium (0.8 to 0.95)	149	€176,217	€183,331	€7,114	1.11
- high (>0.95)	197	€128,050	€137,323	€9,273	1.18

Characteristic	Number of services	Sample means			
		Total annual cost	Total annual income	Total absolute surplus	ICR
Average group size:					
- low (<12)	164	€152,677	€157,538	€4,861	1.16
- medium (12 to 17)	180	€194,300	€205,227	€10,927	1.09
- high (>17)	172	€98,216	€106,967	€8,751	1.18
Number of hours of ELC/SAC:					
- small (<15k)	163	€37,691	€42,008	€4,316	1.23
- medium (15k & <50k)	182	€75,096	€81,485	€6,389	1.13
- large (50k plus)	189	€316,057	€329,644	€13,587	1.06
Single site	489	€134,092	€141,469	€7,377	1.14
Multisite (part of chain)	45	€310,558	€328,933	€18,375	1.07
Staff benefits:					
- none	324	€107,226	€115,496	€8,270	1.17
- only sick pay	132	€187,741	€196,803	€9,062	1.11
- other mix	78	€256,705	€263,866	€7,161	1.06
Premises type:					
- owned	234	€139,032	€146,959	€7,928	1.15
- formal lease	173	€178,953	€189,911	€10,958	1.13
- neither owned nor formal lease	111	€118,904	€124,662	€5,758	1.14
ECCE and other income	334	€207,664	€217,154	€9,490	1.11
Only ECCE income	200	€50,931	€57,254	€6,323	1.19
No ECCE higher capitation	279	€120,672	€125,780	€5,108	1.15
ECCE higher capitation	255	€179,915	€191,716	€11,801	1.12
No paid time for CPD	346	€125,692	€132,458	€6,766	1.13
Paid time for CPD	168	€204,049	€214,789	€10,740	1.11
Not graduate led	214	€90,922	€96,137	€5,215	1.15
Graduate led	320	€187,777	€198,146	€10,369	1.13

Characteristic	Number of services	Sample means			
		Total annual cost	Total annual income	Total absolute surplus	ICR
Average staff qualification level:					
- low (<6)	165	€167,956	€175,735	€7,779	1.1
- medium (6 to 6.5)	235	€138,440	€147,719	€9,278	1.18
- high (>6.5)	133	€144,837	€152,262	€7,425	1.12
Urban	310	€175,964	€185,538	€9,574	1.13
Rural	223	€111,982	€118,542	€6,560	1.15
Region:					
- border	43	€154,799	€168,940	€14,142	1.12
- Dublin	133	€179,289	€186,800	€7,511	1.12
- mid-east	83	€147,198	€152,325	€5,127	1.14
- mid-west	62	€162,446	€173,792	€11,346	1.18
- midlands	32	€159,590	€174,651	€15,061	1.20
- south-east	48	€109,003	€115,191	€6,189	1.13
- south-west	77	€130,653	€137,476	€6,823	1.14
- west	56	€113,496	€120,529	€7,033	1.11
Deprivation index:					
- affluent	39	€177,477	€185,951	€8,473	1.13
- marginally above average	232	€138,968	€146,289	€7,321	1.15
- marginally below average	225	€144,306	€153,393	€9,087	1.13
- disadvantaged	36	€218,941	€228,856	€9,914	1.09

Notes: Statistics for the geographic area variables (urbanity, region and deprivation) were provided by Crowe/Apteilegen because the geographic variables could not be shared to ensure that individual services could not be identified

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