

Estimates of the Cost of a Child in Ireland

Eoghan Garvey, Eithne Murphy and Paul Osikoya

Combat Poverty Agency
Working Paper Series 11/0
ISBN: 978-0-9565661-0-2

August 2011



Abstract

The cost of a child is estimated using information from the household budget surveys from 1987 to 2004. We use an Engel method, where the share of household expenditure on food and a broader basket of necessities both act as proxies for the material standard of living. The cost of a child is also disaggregated according to age, gender and the income status of the family. We find that older children are more costly than younger children and that children cost proportionately more in lower income households. The gap between the cost of children for lower and higher income households has increased over time. Our findings on the cost of children according to age are consistent with international findings and previous results for Ireland. Our results on the cost of children according to the income status of their families are consistent with the results of international studies using comparable methods.

Key words

Cost of children, equivalence scale, age of child, gender of child, household expenditure level

Disclaimer

This report was co-funded by the Combat Poverty Agency under its Poverty Research Initiative. Funding was also provided by the Department of the Environment, Heritage and Local Government and by Pobal. The views, opinions, findings, conclusions and/or recommendations expressed here are strictly those of the author(s). They do not necessarily reflect the views of the Combat Poverty Agency, which takes no responsibility for any errors or omissions in, or for the accuracy of, the information contained in this Working Paper. It is presented to inform and stimulate wider debate among the policy community and among academics and practitioners in the field.

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Acknowledgements

This work was initiated by Dr Eoghan Garvey. Tragically, Eoghan died before the completion of the study. The study is poorer as a result and the remaining authors accept responsibility for any errors or shortcomings which Eoghan would have undoubtedly spotted if he had seen this study through to its conclusion.

1 Introduction

This study aims to empirically estimate the financial cost associated with having children. We believe that this is an important social datum, for a number of reasons. It can help inform the design of income support systems, be they universal child benefit or the adjustment of other targeted social welfare payments when children are present in the household. It is useful information in separation and divorce cases in terms of trying to establish suitable levels of child support. Finally, such information can be used to measure poverty and inequality across households, including establishing the percentage of children at risk of poverty.

Some social analysts would assert that having children is a private decision made by rational individuals, who would only choose to do so if, costs notwithstanding, they deem it to be in their own interests. As a consequence they would argue that any costs associated with children should be wholly borne by parents. This is a contestable position that is open to a range of challenges, including the obvious economic ones that the benefit to society of having children exceeds the private benefit to their parents and/or that capital market failures exist that would result in insufficient private investment in children. Nevertheless, even if it were fully conceded that the State has no role to play in subsidising the cost of children, it would still not negate the case for attempting to calculate the cost of children and using that information for some of the other reasons alluded to above.

Consensus on the importance of knowing the cost of children (regardless of who bears the burden) does not eliminate disagreement. This is because there are different ways of defining child costs and different methods of estimating such costs. This has led some economists to assert that there are no true costs of a

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child and that in the end it is a matter of judgement (Citro and Michael, 1995).¹ While we concur with this view, we also believe that from a policy perspective it is useful for these judgements to be informed by empirical estimates, varied and all as they may be.

Child cost studies can be categorised into two broad camps: the Budget standards approach and Expenditure approaches. The Budget standards approach defines what a household needs in order to achieve a reference material standard of living at a given time and place. By comparing the cost of achieving that standard of living for a household with and without children, it is possible to estimate the cost of children. This approach can in theory be applied to achieve any standard of living, from very basic to more generous. It is an explicitly prescriptive approach insofar as judgement is required as to the goods and services that need to be consumed (and in what quantity) in order to achieve a particular standard. It is a method whose roots lie in the assumption that poverty is deprivation of an absolute sort, i.e. the failure to achieve an adequate standard of living. However, it has evolved from its Victorian origins to encompass living standards that reflect median societal norms. So in its modern guise it embraces a more relative view of poverty, to the extent that a household's situation is assessed against what is normal for the society in which it finds itself.

The Expenditure approaches utilise data on the actual spending patterns of diverse households to determine how much income a family with children needs in order to be as well off as they would be if they had no children. These approaches more obviously resonate with the notion that poverty is relative since the broad basis for the judgement on living standards is the expenditure pattern

¹ Even when family income is **known** measuring inequality and poverty still requires judgement, namely what weight to give to extra household members and where to draw the poverty line.

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of the childless household. All expenditure procedures involve the application of statistical methods to the data, differing only in terms of precise expenditure that is deemed to be representative of the living standards of the family. The commonly used expenditure techniques are classified as: Engel, Rothbarth and Demand systems. The Engel slant is to assume that the share of the household budget spent on food (or necessities) reflects the family's standard of living, while for Rothbarth, it is absolute expenditure on adult goods. Demand systems (the most computationally complex of Expenditure approaches) assume that all goods consumed by a household impact on its welfare in some distinct way (given the preferences of the family) and attempt indirectly, through an analysis of expenditure on all goods, to retrieve that relationship.

Studies done to date on the Cost of Children in Ireland have employed a range of methodologies. Carney et al (1994) was the first to undertake a study of the financial costs of children using a Budget standards approach. An updated (using the Consumer Price Index) version of the Carney results for 2003 is contained in Corrigan (2004). A more spatially and socially specific application of the Budget standards method was conducted by the Vincentian Partnership for Social Justice (VPSJ), who in 2004 developed a low cost but acceptable budget standard for different household types, including those with children. In 2006 the VPSJ expanded this work to include a broader range of households and budgets, based on the shopping patterns of Irish families (unlike the 2004 study, where the budget was developed in the UK and applied to Ireland). Studies utilising an Expenditure methodology include Conniffe and Keogh (1988), who estimated an equivalence scale for the cost of children (the extra income a household with children would need to be as well off as the childless household) with 1980 household budget survey (HBS) data and, more recently, Bargain et al (2010) did likewise with 2004-05 HBS data. While Conniffe and Keogh (1988) derived their equivalence indices from the estimation of a Demand system, the indices

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calculated by Bargain et al (2010) were derived from a variant of Rothbarth estimations.

This study also adopts an Expenditure approach, using individualised HBS data. Moreover, it does so for four time periods – 1987, 1994, 1999 and 2004-05. This allows us to track the cost of children in Ireland over time. Another difference between this and the aforementioned studies is that we derive our equivalence indices from Engel estimations, where the proxy for the household's standard of living is, in one instance, the share of food in total household expenditure and, in another, a broader basket of goods deemed to be necessities. We also produced estimates according to the gender of the child, the age of the child and the income status of the household. An index is also calculated for the single adult household, which allows us to calculate the equivalent weight for extra adults in a household as well as children. This is interesting as it facilitates comparison between the cost of children (especially older children) and adults and, also, it allows us to compare our results with officially employed weights used to calculate equivalised household income and employed for the purposes of, inter-alia, estimating those families at risk of poverty. Officially employed weights are 0.66 for an additional adult (where an adult includes children over 14 years of age) and 0.33 for children.

Given the sensitivity of indices to the method of estimation used, we believe that our approach complements the limited number of studies that have already been conducted for Ireland. Furthermore, we would defend an Engel-based approach on the grounds of its intuitive plausibility and empirical realism; that is to say, since better off families spend proportionally less on food and necessities than less well off families, expenditure on the latter is a reasonable proxy for a family's standard of living.

In Section 2 we explain the equivalence scale approach to making inter-household welfare comparisons. Section 3 critically evaluates the varying bases according to which equivalence scales are estimated. Section 4 describes the estimation method(s) used and the data employed. In Section 5 we report on the revealed expenditure patterns of different family types differentiated according to the number of children in the family and where the family is located in the national income distribution. In Section 6, we present our results on the cost of children in Ireland for four distinct time periods between 1987 and 2004. Section 7 concludes.

2 Equivalence scales

2.1 Definitions, use and importance

Studies of welfare and poverty measurement rely on certain methods for finding individual consumption within a household. One method of converting from a household to an individual basis is by dividing total household expenditure by the number of people in a household, and then using total household expenditure per capita as a measure of welfare for each member of the household (Deaton, 1997). The problem with this method is two-fold. First, it fails to capture economies of scale that arise from living together and from which larger households will benefit more than smaller households. Second, it fails to recognise that not everyone in the household is the same or has the same needs. Children, for example, generally consume less than adults and children of different ages and gender have differing consumption needs. As a result it becomes obvious that simply dividing household consumption by the number of household members is a crude proxy for measuring welfare.

One way of dealing with economies of scale and differing needs among household members is to calculate a system of weights, whereby additional adults and children in a household count as some fraction of the principal adult. Two adults living under the same roof are not assumed to require double the

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level of expenditure of a single adult in order to enjoy the same material standard of living as their single compatriot. This is due to the joint consumption of certain goods (rent, heating, lighting, tv, etc). These goods are essentially local public goods, which means that an extra household member consuming these goods does not diminish the consumption (or wellbeing) that the first individual derives from these goods. Regarding the differential needs of individual household members, children are usually assumed to have lesser material needs than adults, so generally they are allocated lower weights than are additional adult household members. By allocating weights to additional household members, the effective size of the house is then the sum of the weighted members and not the sum of the number of persons in that household.

What are called 'equivalence scales', in turn, directly employ these weights to provide estimates of the income needed to equalise welfare among households of different types. For example, if our reference household is the childless couple then an equivalence scale of 0.7 for the single person household is saying that the single person needs 0.7 times the income of the couple to be as (materially) well off as that couple. Or a household of 2 adults and 2 children may have an equivalence scale of 1.6, meaning that it requires 1.6 times the income of the childless couple to have the same level of welfare. It may be that the weights attributed to the first and second child differ due to economies of scale in child costs (for example .35 could be the weight for the first child and .25 the weight of the second) or they may differ if the children are of different ages or gender and therefore weighted differently.

The choice of equivalence scales has important implications. Myriad policy decisions depend explicitly or implicitly on equivalence scales. Their use is now standard practice when comparing the welfare of different households and when evaluating poverty and inequality within a country and between countries (Atkinson, 1992; Buhmann, 1988; Burkhauser et al, 1996; de Vos and Zaidi, 1997; Duclos and Mercader, 1999). In addition, redistributive policies such as

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income support measures ranging from social welfare to child benefit implicitly employ equivalent scales that reflect judgements as to the relative needs of different types of households. So, assumptions about the relative needs of different households are reflected both in policy and in evaluating the outcome of policies on income distribution.

However, importance notwithstanding, the measurement and assessment of income distribution and poverty across different household types is sensitive (to some extent) to the equivalent scales employed. So for example, the lower the weight given to an additional household member, the higher will be the calculated equivalised income index, since household income will be divided by a smaller equivalised household size. All other things being equal, this will reduce the likelihood that households of more than one person will be seen to experience income poverty. Similarly, how older children are evaluated relative to additional adults or younger children will impact on measured equivalised household income. Treating children aged 14 and over as adults and giving them a higher weight will result in lower equivalised household income than if they were treated as children and weighted accordingly.

The Survey on Income and Living Conditions in Ireland (SILC) is the official source of data on household income that measures key social indicators such as consistent poverty and risk of poverty. When calculating equivalised income for households, the national scale gives a weight of 1 to the first adult, 0.66 to each subsequent adult (aged 14+ and living in the household) and 0.33 to each child aged less than 14. This is different to the weights used by Eurostat which employ a modified OECD scale, where an additional adult is given a value of 0.5 and an additional child a value of 0.3. So, larger households are deemed to do less well in the scale employed by the Central Statistics Office than that employed by Eurostat, although the real gap is between estimated household income of a single adult compared to a two or more adult household as opposed to the gap between a childless couple and a couple with children. However, while the

relative wellbeing of different households is sensitive to the choice of equivalence scale, the trend over time of different groups is not.

2.2 Methodological challenges

As alluded to above, despite the policy and welfare importance of equivalence scales, their application is fraught with difficulty since results may not be robust to the choice of scale (see Coulter et al, 1992a-c; Banks and Johnson, 1994; Jenkins and Cowell, 1994; Cowell and Mercader, 1997 and 1999). For example, the poverty rate of children will be higher when using scales that give greater weight to each additional household member. Another example can be seen in the comparison of poverty across different groups. A comparison of children and the elderly that uses equivalence scales incorporating large economies of scale or attributing low needs to children will find relatively few children in poverty, but a relatively high number of the elderly (Deaton, 1997). As a result this can make international comparisons of poverty rates in various socio-economic and age groups difficult.

The unit of analysis is also contentious. According to Nelson (1993), while older economic theory and most policy applications defined household welfare as the material standard of living of every individual in the household, more recent academic literature tends to conflate household welfare with the material welfare of the adults (or parents). The earliest example of this was Rothbarth (1943) who substituted parental welfare for household welfare and who proposed that excess income be adopted as the criterion of the standard of living of the parents. (Practical applications of Rothbarth's concept of excess income have been expenditure on exclusively adult goods.) Most likely, Rothbarth's focus on adult wellbeing as an indicator of household wellbeing presumed that there would be a broad correspondence between the standard of living attained by parents and the standard of living of the children in that household. Even many of the utility-based models of household welfare (which find such favour with economists because of

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their microeconomic theoretical underpinnings) focus on the utility of the adult (see Barten, 1964; Gorman, 1976; Deaton and Muellbauer, 1986). The problem with models that focus on adult utility is that, when incorporated with other standard economic assumptions, they give rise to counterintuitive results. So an increase in household income should not lead to an increase in children's consumption since the decision maker is presumed to only get utility from his/her own consumption. Moreover, having children increases the relative price of goods that are consumed by both children and adults and so leads to a substitution away from such goods towards exclusively adult goods. As Nelson (1993) indicates, if households really behave this way, then policy questions informed by analysis that equates household and adult welfare need radical reformulation. On the other hand, if adults when making expenditure decisions consider the welfare of their children directly, these models can hardly be a good guide for policy.

A more fundamental question that research on inter-household welfare comparisons raises is what is meant by welfare and whether all forms of welfare disparities are suitable for redress through policy measures. So, for example, is welfare determined by physiological need or does it have a subjective element to it? Economic theories of welfare post-1940 emphasise the subjective nature of welfare (a form of preference satisfaction). The policy challenge posed by this perspective is that it renders welfare incapable of observation and makes it impossible to make interpersonal comparisons of welfare. While most contemporary economists for reasons of pragmatism would not subscribe to the policy impotence implied by *pure* economic theory, their preferences as to choice of scale tend to be influenced by a subjective utility framework. Hence economists tend to favour deriving equivalence scales from revealed expenditure of households on commodities. Their demand patterns are assumed to give insight into underlying utility that is derived from such spending. However, according to Pollak and Wales (1979), such scales are really *conditional* (as

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opposed to unconditional or true) welfare measures, since they fail to control for the effect that household composition has directly on welfare as opposed to indirectly through commodity demand.

An earlier (pre-1940) economic tradition with its emphasis on material wellbeing and cardinal welfare had no such measurability issues and hence assumed that interpersonal comparisons of welfare could be made among households. More recently, Sen (1987) distinguished between the broader subjective conception of welfare and the more objective standard of living. The latter he interpreted in a materialistic (capability) sense that related to one's capacity to satisfy needs. This, it can be argued, is the proper domain of distributional and policy issues that aim to address and redress social inequities. Examples of equivalence scales derived from some explicit normative notion of need are those that are based on Budget standards or those that proxy some good or combination of goods as best indicators of a household's standard of living. The former represent the relative cost between different households of a basket of goods considered necessary to achieve a reference standard of living. The latter (proxy) identifies some good(s) and treats the level or share of expenditure on same as indicating a household's standard of living. These scales are in contrast to those derived from household demand for all goods which are used to determine underlying household preferences. Such commodity preferences are deemed to reflect a household's material welfare.

Since equivalence scales can be calculated according to any of the aforementioned assumptions as to what constitutes household material welfare and, given the sensitivity of the scales to the underlying assumptions, it is important to look at the strengths and weaknesses of the different approaches. It is to this that we now turn.

3. Review of the literature on different bases for equivalent scales

3.1 The Budget standards method

The first application of the budget standards approach can be traced back to the pioneering work of Seebohm Rowntree who attempted to estimate the extent of poverty in England by identifying what different families needed in order to maintain physical efficiency and then costing the basket of goods that was sufficient to meet those needs (Rowntree, 1901). This is also known as the basket of goods approach. It is an explicitly normative approach in that it requires judgement and values to determine what goods should be selected.

The budget standards approach received little attention in the UK until the 1970s. According to Bradshaw (1993), this was due to its association with the unpopular notion of minimum subsistence levels. By contrast, this type of research continued to be conducted in the US. Work done by the US Bureau of Labour Statistics (BLS) used two standards of living, a *basic minimum* and a *modest but adequate*. The latter was what was considered sufficient to satisfy prevailing standards of what is necessary for health, efficiency, the nurture of children and participation in community activities (US Bureau of Labour Statistics 1948). Since the early 1980s, the budget standards approach has been widely deployed in Canada, Australia, the UK and Europe according to the two standards of living identified above. By not focusing exclusively on physical necessities but also including social needs, modern variants of budget standards need to draw on judgements that are based on both scientific and behavioural evidence. The fact that the budget standards approach can be made correspond to any standard of living is widely viewed as showing the strength of this method. The *modest but adequate* benchmark measures the cost of a basket of goods deemed necessary to enjoy a standard of living equal to the median in society, whereas the *basic minimum or low cost* aspires to a standard of living which is more modest but would still enable the individual to participate in society in a way that is consistent

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with community standards (see Piachaud, 1979; Bradshaw, 1993; Saunders, 1998a; Parker, 1998; Henman, 2001, 2005).

Variants on the budget standards approach are the *itemised* method and the *difference* method. The *itemised* approach involves identifying those goods (or part of them) that are associated with children and costing them. Some studies (of the itemised variety) focus only on those goods that can be clearly ascribed to children such as their food, clothing, health, personal care, schooling and leisure needs (see Piachaud, 1979). This approach has been criticised for producing at best partial estimates of the cost of children but this limitation is seen by others as its strength, in that it removes the uncertainty regarding the allocation of shared household costs and it keeps estimated costs to a minimum. Including child costs items that are shared in the household has the advantage of a more comprehensive coverage of relevant goods and services but inevitably requires additional normative judgements as to how to allocate shared costs. The *difference* method estimates the costs of children by taking the difference in the budget standard of a household with children (or varying numbers) and those without children. The advantage of this method is its simplicity and the fact that it does not include those items of household expenditure that would have been there anyway in the absence of children.

According to Corrigan (2004), the clear advantages of the budget standards approach are its transparency, flexibility and general comprehensibility. It also explicitly addresses the issue of need, be it basic needs narrowly defined, such as food, clothing and housing or what is actually needed to participate actively in society, such as good health, access to transport and leisure activities as well as a range of personal items and household goods. Corrigan also highlights that it is an approach that involves a range of validation processes, such as the input of experts in different fields, the use of expenditure surveys and focused interviews. However, as Bradshaw (2001) indicates, these aforementioned qualities are

really double edged. Any explicitly normative element when it comes to defining need is bound to be contentious and the fact that the estimation method is so transparent renders it more subject to critical attention than other harder to understand more opaque methods. Bradshaw further highlights the fall from political grace of this approach in the fact that while the most detailed work on budget standards has been done in the UK and Australia, the results of this work have not been adopted as standards by governments in these countries. It is an open and intriguing question as to why this has happened.

3.2 The Engel method

The Engel method of estimating equivalence scales assumes that the welfare of a household is accurately reflected in the share of household expenditure on food. Engel (1895) proposed this method after observing that there existed a negative relationship between the expenditure share on food and total household expenditure; that is to say, as households got richer they spent proportionately less of the household budget on food. Engel also observed that the expenditure share on food increased with household size. This led him to conclude that if two disparate households (one with children and one without) spent the same share of their expenditure on food, members of those two households must be equally well off. Equivalent scales based on an Engel methodology are the additional income required to restore the food share of a household with a particular composition (with children) to what it would be if there were no children in that household.

Dawson (2001) calls the equivalence scales based on an Engel methodology objective scales as they are based on observable household behaviour (as revealed in budget surveys). However, their use does involve a normative element insofar as expenditure on food (or more recently, a broader range of goods deemed necessities) is considered to be a reasonable indicator of how well off a family is. While this method does have intuitive appeal (it is clear in the

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real world that richer families spend less of their budget on food than poorer families), it has been criticised as observation without theory and its critics have also claimed that it is likely to overestimate the real cost of children (Deaton and Muellbauer, 1986). Regarding the first charge about lack of theoretical foundations, it must be borne in mind that what many economists mean by this is a lack of *neoclassical* theoretical foundations, where all behaviour is assumed to be capable of explanation through the correct specification of a utility function and economic constraints. As pointed out by Dawson (2001), an alternative theoretical framework (such as an institutional one) would give rise to a different rule as to how decision makers in households allocate expenditure. For example, if we assume that financially constrained households allocate expenditure lexicographically according to prioritised need; this could certainly justify the use of an Engel standard for welfare for these households.²

A propos the second claim that Engel estimates overstate the cost of children, this is based on the premise that food is a high proportion of total child costs. Therefore, the presence of the child results in the marginal consumption on food exceeding its average, which leads to a rise in the food share even if the share of food for adults is constant. However, as Bradbury (1994) has pointed out, this criticism may be more appropriate to developing countries and not to developed countries where children may be intensive users of other goods and so the direction of the bias is less clear. One reason why food share could legitimately be deemed insufficient as a measure of the cost of children is because there are fewer economies of scale in food consumption compared to other goods and services that children also consume. This is easily rectified by extending the basket of goods beyond food to include other necessities (such as housing and

² Lexicographic preferences depart from the standard neoclassical assumption that all goods are substitutable in the preferences of the individual. Instead, certain goods are absolutely more important than others and scarce resources will be spent on these goods first, before being spent on less essential goods. So expenditure on such necessities can be a reasonable proxy for assessing the material wellbeing of a household.

clothing) which are more likely to exhibit economies of scale. This would correct any upward bias that food might impart with a downward bias from these other goods. It would also satisfy the perspective mentioned above that basic needs have first claim to household expenditure.

In fact Engel's estimation (both with food or with a basket of goods deemed necessities) has remained popular in applied studies (see Tran Nam and Whiteford, 1990; Tsakloglou, 1991; Phipps and Garner, 1994; Lancaster and Ray, 1998; Percival and Harding, 2000, 2005). This is partly on computational grounds as it can be estimated using single equation techniques on cross section data.

3.3 The Rothbarth method

Rothbarth (1943) proposed using the level of excess income as a criterion for the standard of living of parents in a household. In applications, expenditure on adult goods has been taken as a representation of the Rothbarth method as originally popularised by Nicholson (1949) and Henderson (1949, 1950). According to this view, the presence of children will adversely affect parents' consumption of adult goods. To be as well off as they were before they had children, it is necessary to restore their level of consumption on adult goods to what it was when they were childless. Most applications proceed by identifying goods that only adults will consume. Commonly used goods are alcohol and tobacco or adult clothing. Computationally it is similar to Engel's but differs in that the share of food (necessities) is replaced as the dependent variable by the level of expenditure on adult goods. For some economists an equivalence scale calculated from a Rothbarth estimation is preferable to one based on an Engel estimation. This may be because it is easier to reconcile with the utility function approach of neoclassical economics. Deaton and Muellbauer (1986) assert that adult expenditure is a sensible, albeit narrow measure of adults' living standards. As long as parents' preferences are separable between their own and their

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children's consumption, then their demand for adult goods can be used to infer underlying adult utility. Gronau (1988) and Lazear and Michael (1988) also show that separability of parental and child utility and constant adult preferences provide acceptable theoretical underpinning for using the Rothbarth model to proxy household welfare. Yet most economists would also accept that if the presence of children alters the effective price of adult goods, then equivalence scales based on Rothbarth will underestimate the cost of children.³ That notwithstanding, Deaton and Muellbauer (1986), who estimate both Engel and Rothbarth equivalence scales for Sri Lanka and Indonesia, claim that the latter is superior to the former provided that substitution effects are corrected. In general, Rothbarth-based equivalence scales tend to be lower than Engel's.

Other applications of the Rothbarth method can be found in Tsakloglou (1991) who applied it to Cyprus, Bradbury (1994) who used it on Australian data and Bargain et al (2010) who applied an extension of the Rothbarth approach to Ireland. The real disadvantages of the Rothbarth method are practical, i.e. the difficulty in finding a suitable exclusively adult good, estimation difficulties and data accuracy. For estimation errors to be small the income elasticity of demand for the good has to be sufficiently high. This is not the case with tobacco and alcohol. Alcohol and tobacco also tend to be subject to reporting inaccuracies. Adult clothing (often the preferred choice) can be an infrequent purchase which is not always fully captured in budget surveys. At a more profound level, one has to ask how *sensible* is household expenditure on alcohol and tobacco as a measure of welfare (adults and children)? Furthermore, divergences in expenditure on these goods across households may vary considerably, not because of

³ This is because the changed composition of the household increases the relative price of jointly consumed goods and as a consequence makes pure adult goods relatively more attractive. The substitution effect works in an opposite direction to the income effect, leading to a higher level of consumption of adult goods than would be the case if only the income effect of children were at work.

differences in income but differences in preferences (for some families a low level of consumption of these goods may **not** mean a low standard of living).

3.4 The Demand systems method

The majority of contemporary economics literature interprets family wellbeing in terms of utility, following Barten (1964), Gorman (1976) and Muellbauer (1977). Measuring family wellbeing and how the presence of children impacts on same is done by estimating demand across all goods, taking into account total family expenditure (or income), prices and family composition. Following Barten (1964), the assumption is that the presence of children changes the implicit relative prices of certain goods (causing them to deviate from market prices) and that this change impacts on household decision making. All equivalence scales derived from demand systems presuppose a certain mathematical relationship between family composition and the relative prices of the goods the family consumes and between consumption of goods and family welfare. Once the mathematical relationship is specified, it is possible to determine how much total family expenditure would have to increase in order to hold utility constant following the addition of a child.

The main problem in calculating equivalence scales from the parameters of an estimated demand system is that the results will depend on the functional form chosen to represent the determinants of household demand. So, just as Engel and Rothbarth measures of welfare make certain assumptions about what determines household welfare, so too do those based on demand systems. They are also informationally demanding, in that, unlike the single equation methods, these require data that allow for price variation in order for the coefficients of the demand system to be identified. Van de Ven (2003) points out that even with substantial price variation, the method may still not be sufficient to identify model parameters. This is because prices generally vary between time periods, whereas the majority of family characteristics vary within periods. Also, in order

for the equivalence scale to be meaningful when different time periods are included, one must assume that preferences have not changed over time.

3.5 Which method is most defensible?

There is no consensus on the best way to measure the cost of children. Every method has its strengths and weaknesses. This reinforces the case for a variety of methods. The budget standards approach has a long history in poverty related research but it is not generally favoured by economists because they are not comfortable with the concept of 'need' which in their judgement is premised on some prescriptive judgements as to how much children cost. Nevertheless, it is still widely used by researchers associated with welfare agencies (Saunders, 1998b; McHugh, 1999). One of its principal strengths is its transparency. Among the different approaches to estimating the cost of children in Ireland, this approach has been the most popular, with research done using a budget standards method by Carney et al (1994), the Vincentian Partnership for Social Justice (2004, 2006) and Corrigan (2004).

Economists tend to favour demand systems methods of constructing equivalent indices. These can be quite complicated, as indicated above, and their robustness has yet to be established, being quite sensitive to functional form. As Gray (2007) says, it is difficult to determine the extent to which the assumptions (among others, unchanged preferences over time) are driving the results. It is also a method that lacks transparency.

Engel-based and Rothbarth-based equivalence scales are easier to estimate than demand based systems, being single equation estimates. Economists tend to prefer Rothbarth over Engel (see Deaton and Muellbauer, 1986) as does the National Academy of Sciences, although they do admit that no method is fully defensible (Citro and Michael, 1995). We would also take issue with Deaton and Muellbauer's dismissal of the Engel approach on the grounds that food is not an

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appropriate proxy for household welfare. In our view, any proxy for a household's standard of living rests on some value judgement as to material welfare and the Engel approach, especially when applied to a broader basket of necessities than just food, seems to us to be both more sensible and more tractable than the Rothbarth approach. What we know is that generally a budget standards and Engel (food) approach tend to give higher estimates than demand systems and Rothbarth (see Tsakloglou, 1991; Van der Ven, 2004). However, Lancaster and Ray (1998) indicate that this ranking of indices by size (in particular Rothbarth and Engel) very much depends on the proxy good used to represent household welfare. For example, when food is replaced in the Engel estimate by a broader basket of goods (still deemed to be necessities), the estimated cost of children falls. Conversely, Lancaster and Ray (1998) find using a good such as adult education as a proxy for the adult good raises the Rothbarth estimate.

Our main issue with Rothbarth is the difficulty in finding a suitable adult good. The widely cited fear of overestimating the cost of children when using the Engel method is tempered by the use of a wider basket of goods than just food. It is a relatively transparent method and, in our view, using the share of household expenditure that is spent on necessities as a proxy for family welfare is both reasonable and defensible. Moreover, it is an approach that has not been tried with Irish data. Irish studies on cost of children have adopted a number of methodologies, the most popular of which has been the budget standards approach. However, Conniffe and Keogh (1988) calculated the cost of children from an estimated demand system using 1980 HBS data, while more recently Bargain et al (2010) used an extension of the Rothbarth approach on 2004 HBS data. Apart from these expenditure-based studies of the cost of children, Conniffe et al (1999) used non-monetary information from the Living in Ireland survey to calculate equivalised income for heterogeneous households, including those with

children.⁴ Given that we believe that there is merit in the application of a variety of methods, using the Engel approach to estimate the cost of children in Ireland should complement existing research in this field.

4 Empirical Implementation

4.1 Estimation

The functional form for the Engel curve that we use is the Working Leser form. This regresses the share of food in one instance and a broader basket of goods in another on the log of household expenditure and household composition.

$$w_z = \alpha_0 + \alpha_1 \ln X_i + \beta_a n_a + \beta_c n_c \quad (1a)$$

where,

w_z = share of food in household expenditure for the narrow specification of necessities and the share of food, housing and clothing combined in the broader specification of necessities.

$\ln X_i$ = log of total household expenditure,

n_a = number of adults in the household

n_c = number of children.

Different variations of equation 1a were estimated that distinguish children by age, gender and both age and gender combined.

$$w_z = \alpha_0 + \alpha_1 \ln X_i + \beta_a n_a + \beta_c n_c + \lambda n_c \ln X_i \quad (1b)$$

⁴ This approach is rather unique in that the number of possessions that a household has is the welfare standard; that is to say, when two households have the same number of possessions they are considered equally well off. An equivalent income is deduced from the observed income which households of different composition would need to reach the target level of possessions.

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Equation 1b controls for where in the expenditure distribution a household lies. This allows one to look at the cost of children for low (25th percentile), median (50th percentile) and high (75th percentile) expenditure households.

$$\frac{X_i}{X_0} = \text{Exp}\left(\frac{-\beta_c n_c}{\alpha_1}\right) \quad (2a)$$

Expression 2a is the simple calculation of the equivalent index derived from the parameter estimates of equation 1a. X_0 is the reference family, which in our instance is the childless couple. This expression is modified accordingly when children are distinguished by age and gender with β_c being replaced by the relevant coefficient on the type of child. It also requires modification when looking at a single person household adding β_a to the numerator of expression 2a.

$$\frac{X_i}{X_0} = \text{Exp}\left(\frac{-\beta_c n_c - \lambda n_c \ln X_{median}}{\alpha_1 + \lambda}\right) \quad (2b)$$

Expression 2b is the equivalent index derived from equation 1b; that is to say, one that controls for income distribution.

4.2 Data source

The samples are drawn from the Central Statistics Office (CSO) Household Budget Survey (HBS) data sets for 1987, 1994, 1999 and 2004. The population sample for the 4 time periods are 7705, 7877, 7644 and 6884 respectively. These fall into 12 family categories of which we exclude single older adults, young and old childless couples, old childless couples, households with more than 2 adults and others. The reason for dropping the aforementioned households is because we did not deem them to be the type of families with whom families with children tend to compare themselves. This restricts our

sample for the 4 time periods to 3420, 3261, 3170 and 3191 (see Tables 1 and 2 for details).

The total number of goods for the 4 time periods was: 620 for 1987, 648 for 1994, 890 for 1999 and 1927 for 2004. For the purposes of this paper the goods were aggregated into 13 broad categories. Budget shares (as a percentage of total household expenditure) were calculated for each of these broad commodity categories. Tables 3 to 6 show the budget shares for the 13 categories of goods for households differentiated according to family composition over the 4 time periods. Figures 1 to 4 are a visual representation of the information contained in Tables 3 to 6. Tables 7 to 10 identify households by both their wealth and family composition. In the latter instance, households are classified according to expenditure quartiles; that is to say, households in quartile 1 represent the 25 per cent of households with the lowest aggregate expenditure, while quartile 4 represents the 25 per cent of households with the highest aggregate expenditure. Within each expenditure quartile, families are distinguished according to the number of children in the household. It is revealing in itself to look at how expenditure patterns vary when children are present in households and how the impact of children on household spending patterns may differ according to household wealth and how this has evolved over time.

5 Expenditure patterns according to family composition and income

Tables 3 to 6 and Figures 1 to 4 show the expenditure patterns of households with and without children for the 4 time periods of the Household Budget Survey (HBS). What stands out across all periods is how the presence of children causes families to spend a greater share of the family budget on food and non-alcoholic drinks. In 1987 the presence of children was associated with a lower expenditure share on transport and on hotels and restaurants. In succeeding years this trend in food and restaurants is continued although the decline in

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restaurant expenditure that the presence of children caused is less marked after 1999. Transport costs stabilise with the presence of children after 1994, while housing costs fall. Over the time, what stands out most is the fall in the share of food in total household expenditure, a trend that is most marked in families with children. Food share for the representative household with 3 children was almost 31 per cent in 1987 and had fallen to 21 per cent in 2004. The other category of good that changed most over time is spending on recreation, going from approximately 6 per cent in 1987 to 9.5 per cent on average in 2004.

(Recreational share is remarkably constant across family composition, probably reflecting economies of scale in the consumption of this good.) These two trends in food and recreational expenditure were undoubtedly a product of the economic prosperity that the country enjoyed over that time period.

The aggregate commodity shares shown in Tables 3-6 hide a multitude. It is also a well-known fact that expenditure patterns vary widely with income. What Tables 7-10 show are the breakdown of expenditure shares, not only by family composition but also according to where the household finds itself in the distribution of income. The classification of households according to income distribution is conditional on family structure; that is to say, a given family type is further disaggregated by income quartiles. We can see a marked difference in consumption patterns across income quartiles.

In 1987 Food was the most important expenditure category for the poor, averaging around 35 per cent of household expenditure, while for the rich it varied from 15 to 21 per cent depending on family size. Likewise Housing was a much more important expenditure category for the lowest quartile compared to the highest. By contrast, Transport, Hotels and Restaurants and Miscellaneous were more important for the higher income quartiles.

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There appeared to be economies of scale in food consumption for the lowest quartile in 1987 (contrary to what one would expect). This was not the case for all other quartiles, where more children were associated with a greater share of the household budget being devoted to food. Housing also appeared to exhibit economies of scale, with the economies being greater for the lower income quartiles. Likewise, economies of scale existed for transport, though in this instance such economies were greater for higher income quartiles. We can see that children resulted in less being spent in hotels and restaurants for most quartiles, most markedly the higher quartiles, but this was not the case for the lowest quartile. Miscellaneous was static with appearance of children and this held across quartiles.

Over time between 1987 and 2004, there were some distinctive trends in terms of household expenditure generally and the impact of children on household expenditure. Food became generally less important. For the lowest quartile, it accounted for around 25 per cent of household income in 2004, down 10 percentage points in 18 years, while for the top quartile it fell to between 11 and 14 per cent. The apparent anomaly of the poorest households not devoting more of the household budget to food with the presence of children disappeared in 1994 and 1999 but reasserted itself in 2004. Housing was remarkably constant for the top quartile between 1987 and 2004, whereas for the childless couple in quartile 1, it fell but rose for those with one or more children. Transport remained quite stable, with the exception of lower income couples with children. Here we can see that expenditure jumped from 10.9 per cent in 1987 to 15.8 per cent in 2004. Also, while the share appeared remarkably constant across family types for quartile 1 in 1987, this was not the case in 2004, where the presence of children resulted in increased expenditure absolutely and relatively on transport. Hotels and restaurant share of household expenditure increased between 1987 and 2004 for the lower quartiles but not for the higher ones. The effect of children on this category of expenditure remained the same in 2004 as it was in 1987;

that is to say, the presence of children had no appreciable effect for the lowest quartile, while for the highest quartile, they resulted in less of the household budget being spent on hotels and restaurants. Miscellaneous expenditure increased for all groups but especially for higher income groups. The trend was most marked for those families with children. This trend started in 1994 and it seems that the significant change in this type of spending occurs with the presence of the first child, as more children have no marked incremental effect on this share of expenditure. So, while in 1987 there was little difference between higher income childless couples and those with children, this had changed by 2004, whereby the presence of children resulted in more of the household budget expenditure falling into this category.

Notwithstanding changing expenditure patterns across time, it is still the case that in 2004, as in 1987, food and housing were still the big spending items for the lowest quartile. A noteworthy feature, however, is that by 2004 transport was vying with housing as the second most important category for low income families with children. For the highest quartile, miscellaneous expenditure, which in 1987 had been the most important expenditure category for childless couples and couples with one child, by 2004 was unambiguously the most important expenditure category regardless of household composition, absorbing approximately twice the budget share of food. Food had moved down this household's priorities and, in a reversal of its 1987 rank order, had now been superseded by transport spending.

6 Estimated cost of children and comparative results

The cost to households of children is estimated at different levels of disaggregation.⁵ Tables 11a to 15b show equivalent scales where the base case

⁵ The regressions from which the indices presented in Tables 11a to 15b are calculated can be had on request from the authors. The coefficients calculated in these regressions are in almost all cases statistically significant.

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is considered to be the childless couple. All tables labelled *a* are estimates where the welfare standard is considered to be the food share, whereas for all tables labelled *b*, a broader basket of goods is the proxy according to which material standards of living across heterogeneous households is compared. This broader basket includes food, housing costs and clothing. Tables numbered 11 to 15 contain indices that show the cost of children at increasing levels of household information, taking into account the ages of the children, their gender and household income status. The presumption is that the indices in tables labelled *b* will be less than those in tables *a*, since one would expect that there is greater scope for economies of scale (or sharing) when goods such as housing are included in the reference basket. It is reasonable to expect that the more detailed tables such as Tables 14 and 15 yield more precise information as to what impact the presence of children has on household welfare.

According to our more aggregate estimates (see Tables 11a and 11b), the cost of a child for the average household in 1994 was estimated to be between 22 to 26 per cent of household expenditure (22 per cent represents the lower bound and 26 the upper bound). The implication is that the couple with a child would need between 22 to 26 per cent more income to be as well off as the childless couple in 1994. The situation of the single person with a child is also estimated relative to the base case of the childless couple. Still looking at 1994, our estimates imply that a single person with a child would need between 93 to 94 per cent of the income of the childless couple to be as well off. The fact that the index is less than 1 indicates that a child is less costly than an additional adult. (In fact comparing the cost of a single adult to the childless couple for that same year indicates that the appropriate weight for an extra adult in a household is 0.35.) The indices in Tables 11a and 11b do not differ greatly although, unsurprisingly, they are smaller when a broader basket of goods is used. The cost of a child has increased over time using both baskets of goods, and children do not exhibit economies of scale in our measurement. Our results are also

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broadly in line with comparable international studies for developed countries (see Engel estimates in Table 16 which show equivalence scale estimates using different methodologies for Australia).

What Tables 12a and 12b show clearly is that children are not a homogenous category and their impact on the household's standard of living varies considerably with the age of the child. Younger children cost much less than older children, where the latter are defined as children between the ages of 14 and 20. Older children will consume more food and, as the higher indices in Table 12b show, they are also more costly when it comes to other goods (clothes come to mind). This is reinforced when looking at the figures for single parents with older children. When food is the welfare standard, a single parent with an older child still needs about 5 per cent less income than the childless couple to spend the same percentage of household expenditure on food. However, when the basket includes food, housing services and clothing (see Table 12b), there is very little difference between the income needs of the family that consists of a single person with an older child and the childless couple. Indeed, for the periods 1999 and 2004, the figures indicate that the former family type needed marginally more income than the latter to enjoy the same standard of living. In the Survey on Income and Living Conditions in Ireland (SILC) conducted by the CSO since 2003 under EU legislation (Council Regulation No. 1177/2003), an adult is defined as anyone aged 14 or more. So these studies give equal weight to what we define in our study as older children and what SILC define as adults for the purposes of deriving equivalised household size and equivalised household income. While our results give a lower weight to additional adults in a household (between 0.33 and 0.37 compared to SILC weights of 0.66), they do confirm that it is appropriate to treat older children as adults from the point of view of costs.

The results presented in Tables 12 and 12b also show that children between the ages of 5 and 13 generally cost more than younger children. When food is the

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proxy good, the figures for children in the 5-13 age category do not differ much from older children; but when the broader goods proxy is used it can be seen that the 14-20 age group still cost appreciably more than their younger siblings. The broader basket goods proxy also shows a decline in the difference between the cost of infants and 5-13 year olds in 1999 and in fact shows infants as more costly in 2004. This may reflect changing parental consumption (and possibly work patterns) at the height of the economic boom. Our results broadly corroborate the findings of Conniffe and Keogh (1988), Carney et al (1994) and Conniffe et al (1999), despite the use of different methodologies in all studies. Conniffe and Keogh (1988), who define younger children as those up to 4 years and older children as those between 5 and 14, found that, not only did younger children cost appreciably less than older children but that there were greater economies of scale associated with younger children. Conniffe et al (1999) used similar age categories to Conniffe and Keogh (1988) but a different methodology (one that focused on number of possessions as opposed to a demand-based estimation of expenditure across a variety of goods). Despite the difference in methods, both studies showed similar results with regard to the effect of age on child costs and economies of scale. Carney et al (1994) applied a budget standards methodology and categorised children in a manner similar to our study (0-6, 7-12, 13+) and their results also show that the cost of children increases at an increasing rate with age.⁶

As far as the value of the actual indices is concerned, our results generally show a higher cost of children regardless of age than Conniffe and Keogh (1988), whose figure for a young child is 0.12 and for an older child 0.16. This is unsurprising as Engel-type estimates usually yield a higher cost of children than do demand system estimates, as is evident from Table 16. Likewise, Conniffe et

⁶ Most international studies also show that the cost of children increases with age. See for example, Henman (2001, 2005), Percival and Harding (2000, 2005), Tran Nam and Whiteford (1990), Saunders et al (1998), Betson (1990) and Lino (2004).

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al (1999) come up with a lower cost of young children (0.12), although their figure for the cost of an older child (0.21) is closer to our results when we used a broader basket of goods. One key difference between our results and the aforementioned is that ours do not exhibit economies of scale regardless of the age of the child. This doubtless reflects the goods selected in the estimate and is again consistent with international evidence when an Engel approach is adopted.

What Tables 13a and 13b reveal is that in general boys are more costly than girls, although the difference appears to fall over time and, when the broader basket of goods is the welfare standard, a girl child becomes more costly than a boy for the first time in 2004. (Again, this is suggestive that the inclusion of clothing in the basket may account for this disparity in indices.) Bargain et al (2009) found that girls were marginally more expensive than boys but acknowledged the tentative nature of this result given the size of the standard errors. It is more appropriate to compare Bargain's results with our results contained in Tables 14a and 14b since their study is focused on young children using 2004 HBS data. What we find is that the difference between young boys and girls is quite small, with young boys generally costing more than young girls though the historical pattern reversed in 2004 for the narrow basket of goods. This is supportive of Bargain's results although the caveat remains that such results are sensitive to the goods composition of the basket.

According to our results in Table 14a, the disparity between the cost of boys and girls widens as children get older. So while in 1987 the cost of a male infant is 15 per cent of household income compared to 13 per cent for a female infant, the cost of an older male teenage child is 27 per cent compared to 18 per cent for the female teenager. This is unsurprising when the index is based on household food consumption, given the food requirements of growing teenage males. What also stands out is that over the 4 time periods under review, the cost of older children increased. In 2004 a couple with an older male (female) child required

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36 (27) per cent more income than a childless couple in order to maintain food share as a percentage of income. Interestingly, when the broader basket of goods is used, while older male and female children still work out more costly than their younger siblings, the disparity between older male and female children all but disappears. This obviously reflects differences in the needs of children, with households with older boys spending more on food while those with older girls spend more on clothes, expenditure differences that appear to cancel one another out when the broader basket of goods is used. It is unsurprising therefore that the cost of an older male child works out cheaper when the broader basket of goods is used (as opposed to food) but the cost of an older female child is marginally more expensive.

Tables 15a and 15b are of interest because they show what is concealed when households of all income levels are aggregated together for estimation purposes. When food is the proxy good, what stands out is that children impose a greater relative burden on lower income households than on higher income households and the differential cost of children across income does not change over time. However, when a broader basket of goods is selected, there is little appreciable difference in the cost of children between low and high income households in 1987, though in the successive survey periods the cost of children rises for lower income families but remains static for higher income families. The net result is that by 2004, regardless of which proxy good is chosen (food or the broader basket), the cost of a child to a lower income family is ten percentage points higher than it is for a higher income family.

Our results stand in stark contrast to the results of Bargain et al (2010) who found a larger cost of children (as a proportion of total resources) in richer households. They concluded on the basis of their results (indicating a wider dispersion of child resources than household income) that this could mean poor children living in non-poor families. The comparable international literature

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appears to indicate that relative cost of children across income class is sensitive to the method used to estimate the cost of children. So, for example, when a demand systems approach is used, there is no variation in the cost of children across income ranges (Tran Nam and Whiteford, 1990; Valenzuela, 1999). However, when a basket of goods deemed to be necessities is used (similar to our approach), the cost of children, as a percentage of total family expenditure, is less in high income families compared to low income families. Likewise, Henman (2005), using a budget standards approach, concluded that the cost of raising a child is less burdensome on richer households.

So our results on the relative financial burden of children are in contrast to those of Bargain et al but consistent with international studies that use a similar approach to us. In our view, an Engel approach (like the budget standards approach) is more explicitly normative than Rothbarth or demand systems estimation, insofar as judgements are made as to what goods constitute necessities (just as with budget standards judgements are made as to what goods and services should be in the household basket in order to reach a given living standard). It is also noteworthy (in our view) that the more explicitly normative methodologies not only yield higher costs of children than methodologies that do not distinguish between needs and wants (demand systems), but they also show that child cost weighs more heavily on lower income families. Intuitively, this is very plausible since higher income families tend to have higher living standards which children share.

To conclude, our results clearly indicate the heterogeneous needs of families according to the age and gender of children and the income status of families. While our aggregate estimate shows the cost of a child at around 1.23 for a couple (Table 11b), this can range from 1.18 to 1.28 in 2004 according to family income (see Table 15b). Clearly, using the aggregate figure to compensate for the cost of children would under-compensate poorer families relative to their

childless peers and over-compensate richer families. While it might not be practical to differentiate families according to income status if child payments are to be universal, there is a clear case to be made for varying payment according to the age of the child. What stands out unambiguously from our results is that older children are more costly than younger children. This is the case regardless of which proxy is used to represent household welfare. Notwithstanding the previous statement, it is more defensible to use a broader basket of goods than just food to proxy household welfare. It makes intuitive sense, especially in a developed country. Moreover, our results show that the sensitivity of the index to the gender composition of a family disappears when we use a broader basket than simply food.

7 Conclusion

In this study we estimated the direct cost of children for four time periods between 1987 and 2004. We used two proxies for household welfare – food and a broader basket of goods that included food, housing costs and clothing. In general (and unsurprisingly), we found that the estimated cost of a child was lower when using the broader basket as the welfare standard. According to this measure, a couple with a child will need approximately 22 per cent more income than the childless couple to be as well off. This figure was remarkably consistent across 3 of the 4 time periods (unlike the index based on food which showed the cost of children monotonically rising over time). This figure is also consistent with international findings (using a comparable methodology) on the cost of children, in other developed countries (see Tran Nam and Whiteford, 1990; Lancaster and Ray, 1998; Van der Ven, 2004). The figure is higher than the cost of children as estimated by Conniffe and Keogh (1988) and Bargain et al (2010). This is to be expected since estimates based on demand systems (Conniffe and Keogh) and consumption of adult goods (Bargain et al) are usually lower than those based on food and necessities. Engel-based equivalence scales tend to be more similar in

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magnitude to those based on a budget standards approach (see Henman, 2005). Although budget standards methods have been used to estimate the cost of children in Ireland, the results were not presented in the form of equivalence indices, so a direct comparison between these studies and our results is not possible. We believe that broad-based Engel measurements of the cost of children are inherently sensible as they conform to the empirical reality that food (necessities) share of total household expenditure is negatively correlated with household wealth and positively correlated with the number of children. It is also consistent with behaviour that allocates expenditure in a lexicographic fashion according to prioritised need.

Consistent with other Irish studies and international findings, we find that the cost of children varies according to the age of the child, with older children costing considerably more than infants. The estimated cost of older children was similar to the cost of an extra adult. This evidence supports the official practice of weighting older children the same as adults for the purposes of calculating equivalised household income. While Bargain et al (2010) found that girls were marginally more expensive than boys, we found that gender cost differences were sensitive to the basket of goods chosen. When food is the welfare proxy, boys appear more costly than girls, especially older male children compared to older female children. By contrast, there was less of a gender difference in the cost of children when the broader basket was chosen. This reinforces the case for using a broader basket of goods than simply food in Engel-type estimations.

We also found that wealthier families tend to spend proportionately less on children than do poorer families, although the differences were starker in the later periods than in earlier periods. This may be reflective of increased income inequality in the time periods under review. The gap between what the richest quartile spent on a child and the poorest quartile was ten percentage points, regardless of whether food or necessities were used as a proxy. This result is in

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contrast to the findings of Bargain et al (2010) but consistent with international findings using comparable methods. It appears that estimation methods that are more explicitly normative, in the sense of distinguishing between needs and wants, tend to show that children are financially more burdensome to lower income households.

Our results for children are not too far removed from officially used weights which are 0.33 in the SILC. However, our estimated cost of an additional adult is considerably lower (approximately 0.35) than the official weight of 0.66. Using lower weights for additional adults would result in higher equivalised household income for childless couples (and households with older children where the latter are weighted the same as adults) and consequently result in more households with younger children being deemed to be at risk of poverty. We can also see that a universal child payment based on an aggregate cost of a child would probably over-compensate richer households and under-compensate poorer households.

Finally, while there is no *right* answer as to the cost of children, estimating the cost according to different methodologies and based on actual household expenditure patterns gives one potentially upper and lower bounds on costs that can inform policy.

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Table 1: Population

	1987	Ratio	1994	Ratio	1999	Ratio	2004	Ratio
1 Single Young Adults	721	9%	831	11%	673	9%	676	10%
2 Single Old Adults	720	9%	986	13%	818	11%	665	10%
3 Single Parent with 1 Child	63	1%	98	1%	101	1%	118	2%
4 Single Parent with > 1 Child	64	1%	123	2%	103	1%	126	2%
5 Young Childless Couple	536	7%	603	8%	764	10%	839	12%
6 Young & Old Childless Couple	510	7%	501	6%	626	8%	564	8%
7 Old Childless Couple	347	5%	327	4%	283	4%	231	3%
8 Couple with 1 Child	433	6%	378	5%	357	5%	386	6%
9 Couple with 2 Children	654	8%	639	8%	656	9%	574	8%
10 Couple with 3 Children	949	12%	589	7%	516	7%	472	7%
11 3 Adults with Children	774	10%	636	8%	514	7%	299	4%
12 Others	1934	25%	2166	27%	2233	29%	1934	28%
	7705	100%	7877	100%	7644	100%	6884	100%

Table 2: Sample size

	1987	Ratio	1994	Ratio	1999	Ratio	2004	Ratio
1 Single Adults	721	21%	831	25%	673	21%	676	21%
2 Single Parent with 1 Child	63	2%	98	3%	101	3%	118	4%
3 Single Parent with > 1 Child	64	2%	123	4%	103	3%	126	4%
4 Childless Couple	536	16%	603	18%	764	24%	839	26%
5 Couple with 1 Child	433	13%	378	12%	357	11%	386	12%
6 Couple with 2 Children	654	19%	639	20%	656	21%	574	18%
7 Couple with 3 Children	949	28%	589	18%	516	16%	472	15%
	3420	100%	3261	100%	3170	100%	3191	100%

Table 3: Expenditure shares according to family composition in 1987

	No children	One	Two	Three
Food	21.3	22.8	26.9	30.9
Alcohol	0.8	1.0	0.7	0.4
Tobacco	3.8	3.8	3.7	3.9
Clothing	5.5	6.2	5.6	6.4
Housing	13.8	11.8	12.6	12.8
Furnish	6.0	7.6	6.8	5.9
Health	1.6	1.8	1.6	1.5
Transport	15.5	13.6	12.9	11.6
Communications	2.0	1.6	1.6	1.5
Recreation	5.9	5.9	6.1	5.6
Education	0.7	0.8	0.9	0.8
Hotels Restaurant	8.5	7.4	5.7	5.4
Miscellaneous goods	14.8	15.6	14.9	13.2
	100.0	100.0	100.0	100.0

Table 4: Expenditure shares according to family composition in 1994

	No children	One	Two	Three
Food	19.7	20.9	22.0	26.6
Alcohol	1.2	1.2	1.1	0.8
Tobacco	3.1	3.2	3.1	3.1
Clothing	4.9	5.2	6.2	5.9
Housing	13.4	11.8	10.3	11.8
Furnish	5.4	5.8	5.5	5.1
Health	1.9	2.0	1.8	1.5
Transport	13.3	12.2	11.9	12.3
Communications	3.0	2.2	2.2	2.1
Recreation	7.6	7.2	7.6	7.5
Education	1.1	0.7	1.1	1.1
Hotels Restaurant	9.1	8.4	7.8	6.3

Estimates of the Cost of a Child in Ireland

Miscellaneous goods

16.2	19.2	19.5	15.8
100.0	100.0	100.0	100.0

Table 5: Expenditure shares according to family composition in 1999

	No Children	One	Two	Three
Food	18.7	18.3	21.2	24.3
Alcohol	1.2	0.9	1.1	1.0
Tobacco	2.9	2.8	2.3	1.9
Clothing	4.1	5.2	6.0	6.1
Housing	12.7	12.0	10.0	10.2
Furnish	5.6	5.7	5.6	5.9
Health	1.7	2.3	2.1	1.9
Transport	14.6	14.8	13.9	13.2
Communications	3.3	2.8	2.7	2.6
Recreation	8.4	7.2	7.9	8.1
Education	1.3	0.6	0.8	1.1
Hotels Restaurant	9.2	7.8	7.4	6.8
Miscellaneous goods	16.1	19.7	19.0	17.0
	100.0	100.0	100.0	100.0

Table 6: Expenditure shares according to family composition in 2004

	No Children	One	Two	Three
Food	17.1	16.3	19.6	21.3
Alcohol	1.9	1.5	1.5	1.2
Tobacco	2.5	2.1	1.6	2.2
Clothing	4.5	5.4	5.2	5.0
Housing	12.7	12.4	11.9	11.1
Furnish	5.2	5.6	4.3	4.4
Health	2.7	2.0	2.3	2.5
Transport	13.4	13.6	12.4	13.6
Communications	4.6	4.8	4.2	4.2
Recreation	9.6	8.8	10.0	9.2
Education	1.0	1.0	1.4	1.3
Hotels Restaurant	8.6	7.8	7.0	6.7
Miscellaneous goods	16.4	18.7	18.4	17.2

Estimates of the Cost of a Child in Ireland

100.0 100.0 100.0 100.0

Figure 1

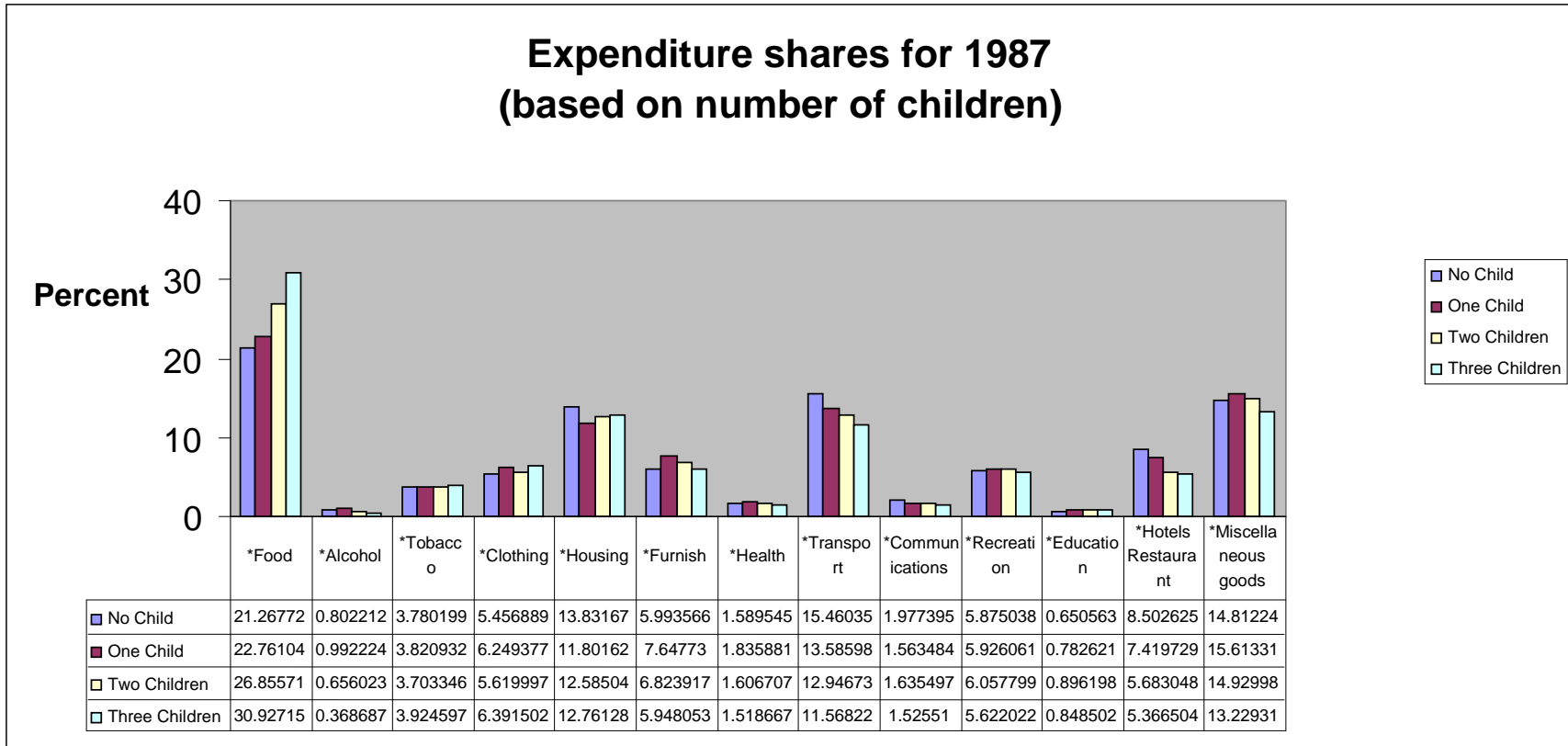


Figure 2

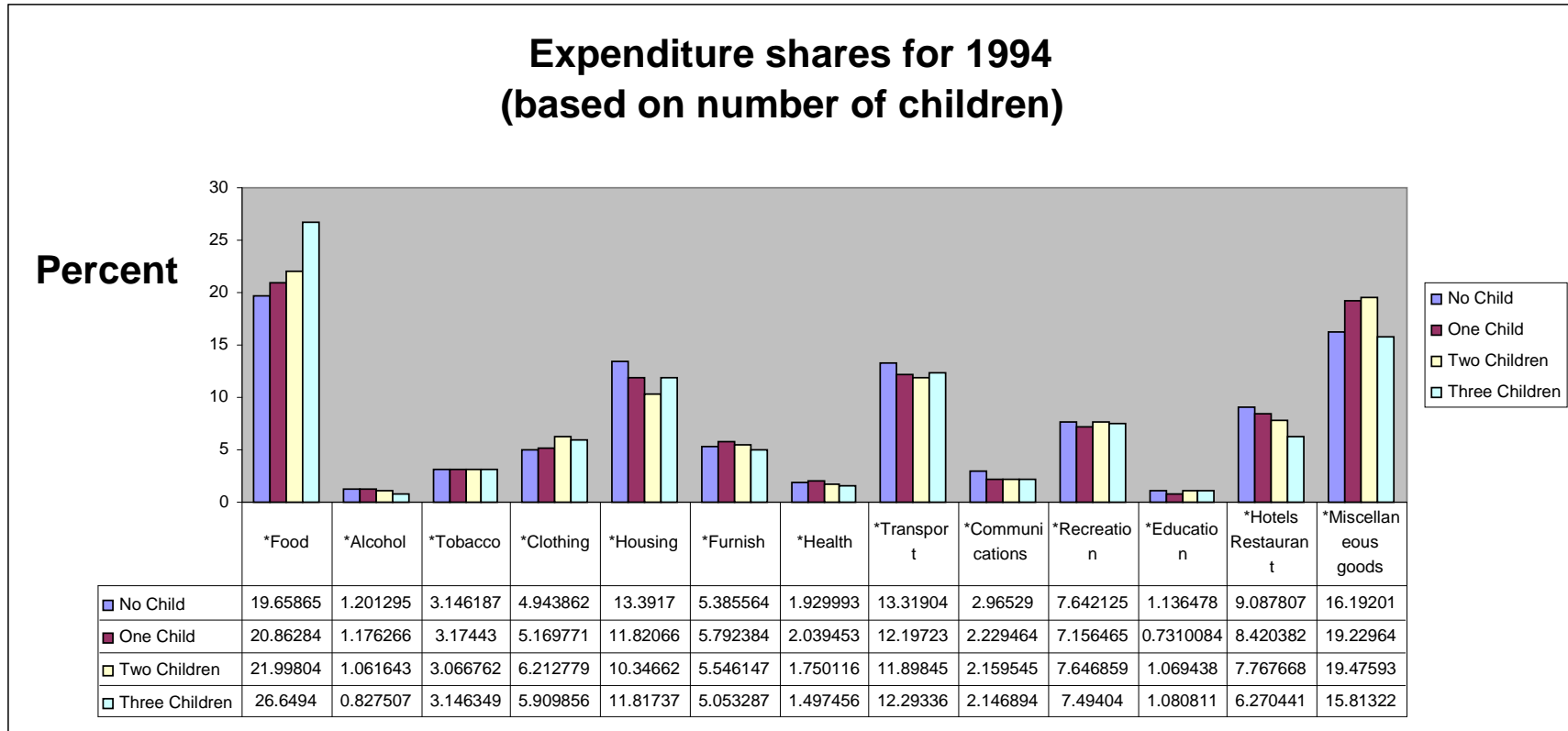


Figure 3

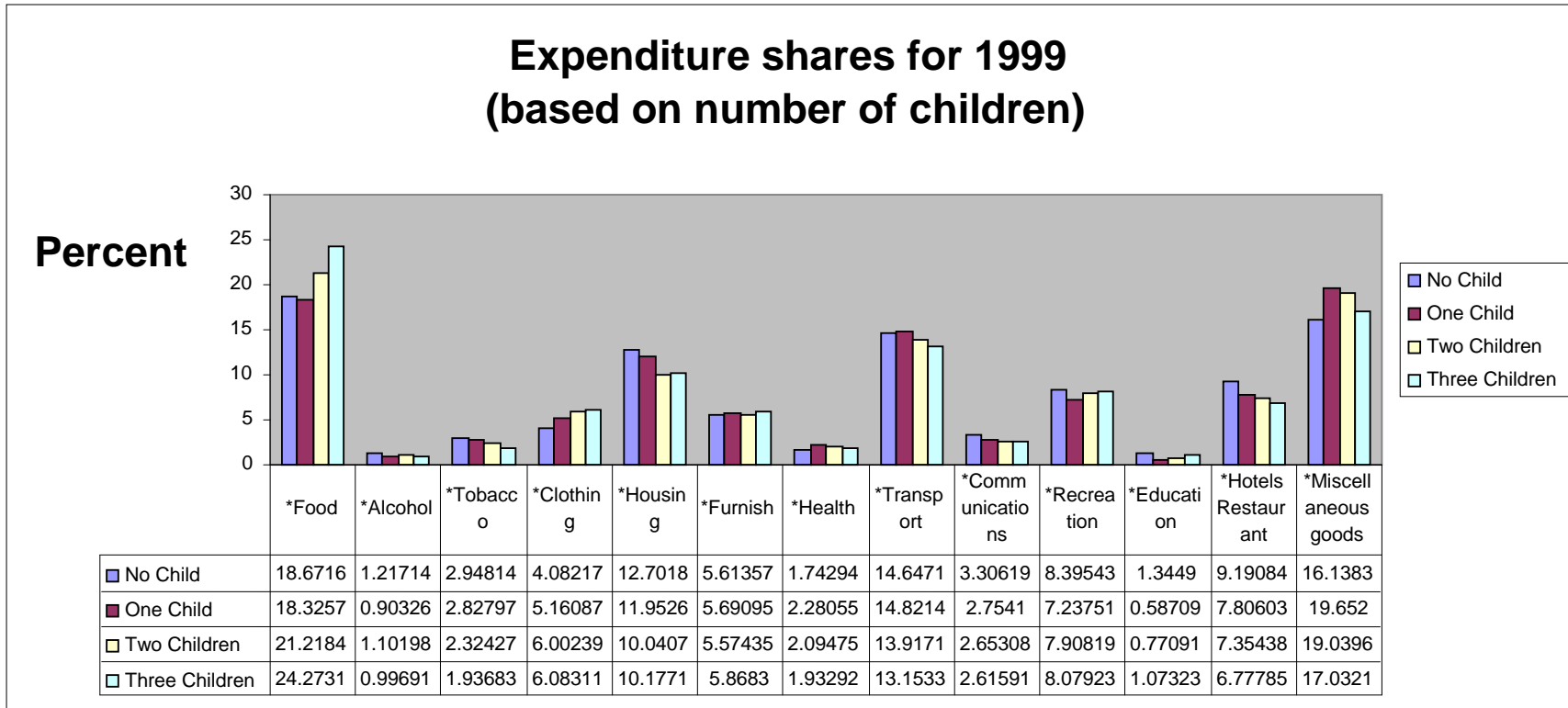
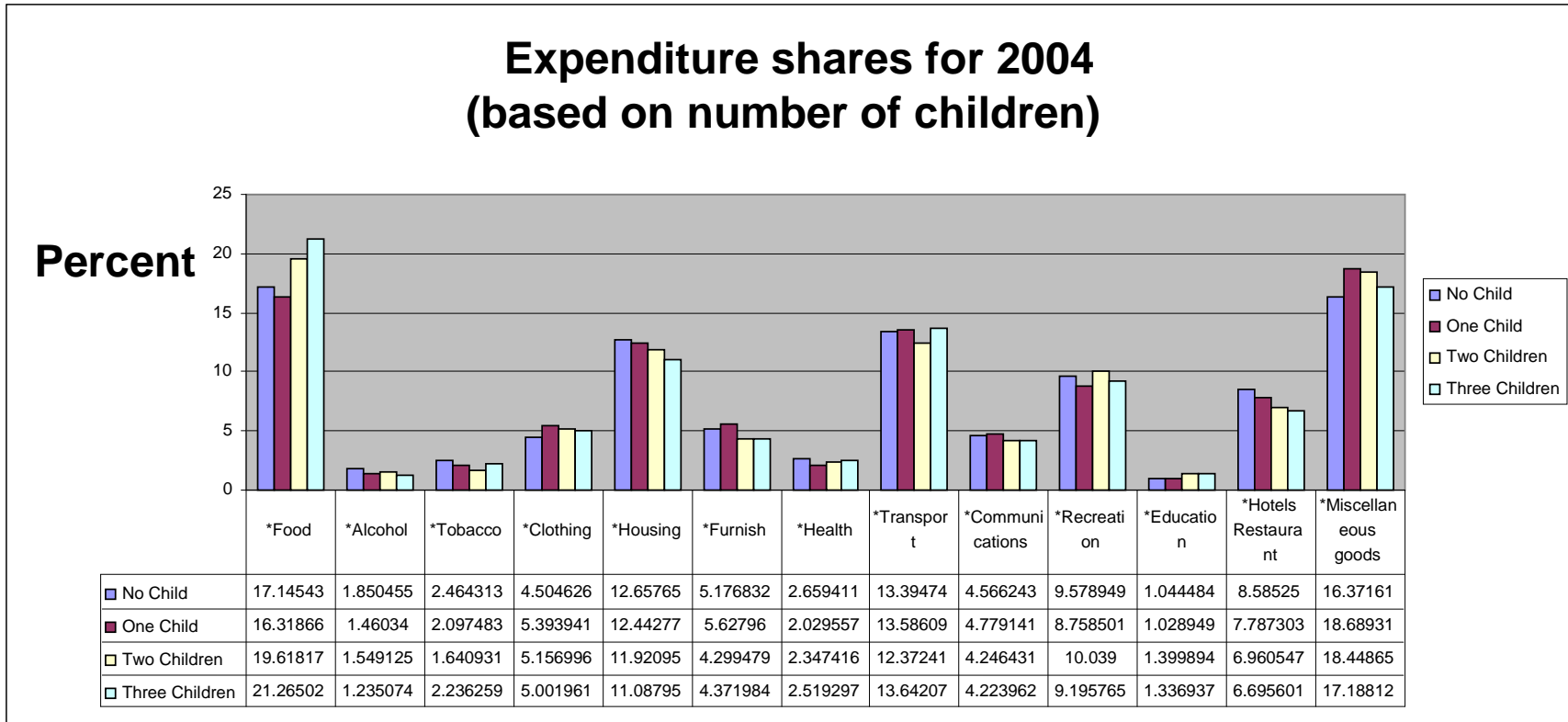


Figure 4



Estimates of the Cost of a Child in Ireland

Table 7: Expenditure shares according to family composition and expenditure status in 1987

	Quartile 1			Quartile 2			Quartile 3			Quartile 4		
	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children
Food	35.1	34.5	35.7	26.3	27	32.2	22.2	23.5	26.1	15.4	16.7	20.9
Alcohol	0.3	0.4	0.4	0.9	1.3	0.4	0.7	0.8	0.6	1	1.2	1
Tobacco	8	8.6	6.8	4.5	5.3	5.1	4	3.5	3.7	1.8	1.7	1.7
Clothing	3	3.5	2.9	5.2	5.4	4.6	4.3	6.2	5.4	6.8	7.1	5.9
Housing	19.7	15.7	15.3	17.3	14.2	14.8	14.3	11.6	12.5	9.7	9.5	10.3
Furnishing	4.3	4.6	6.3	5.6	6.5	5.2	5.8	7.3	6.6	6.9	9.5	8.5
Health	0.8	0.8	0.8	2.2	1.4	1.2	1.7	1.7	1.8	1.3	2.5	2
Transport	9.5	9.6	10.3	13.5	13.4	11.8	15.1	14.2	13.4	17.7	13.9	14.1
Communications	1.8	1	0.8	2.2	1.4	1.3	1.8	1.5	1.8	2	1.9	2.1
Recreation	4.5	4.9	5.6	5.4	5.4	5.7	6.2	6.1	6.1	6.1	6.3	6.4
Education	0.2	0.8	0.6	0.3	0.7	0.6	0.7	0.4	0.8	0.9	1.1	1.5
Hotels	3.5	4.7	4.2	6.7	6.4	5.1	8.7	7.8	6.3	10.9	8.6	6.2
Miscellaneous	9.5	10.7	10.2	9.9	11.5	12.1	14.4	15.5	14.9	19.5	20	19.4
	100.2	99.8	99.9	100	99.9	100.1	99.9	100.1	100	100	100	100

Estimates of the Cost of a Child in Ireland

Table 8: Expenditure shares according to family composition and expenditure status in 1994

	Quartile 1			Quartile 2			Quartile 3			Quartile 4		
	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children
Food	31.5	33.1	34.0	23.2	29.3	27.8	18.0	20.4	21.8	12.5	13.9	16.60
Alcohol	0.7	0.6	0.9	1.4	1.0	0.9	1.1	1.0	0.8	1.4	1.5	1.40
Tobacco	4.8	7.3	4.9	4.2	5.2	5.7	3.4	3.0	2.8	1.5	1.4	1.20
Clothing	3.5	3.5	2.3	3.7	4.8	5.8	5.5	5.4	6.8	5.9	5.5	6.60
Housing	18.2	15.9	14.3	15.0	15.3	13.1	13.2	10.7	9.5	10.4	10.7	8.80
Furnishing	4.5	4.2	5.2	5.7	4.3	4.8	5.8	5.3	5.7	5.4	7.3	6.20
Health	1.3	1.2	0.6	2.6	1.4	1.2	2.1	2.5	1.9	1.8	2.1	2.10
Transport	10.1	9.4	10.9	12.6	10.2	10.7	11.8	13.5	13.5	16.3	12.4	11.50
Communications	3.4	2.3	3.1	3.9	2.9	2.1	2.4	2.1	2.2	2.5	2.0	2.00
Recreation	5.6	5.5	5.2	6.0	5.5	6.7	8.0	7.3	7.5	9.5	8.3	8.80
Education	0.1	0.6	0.8	0.9	0.5	0.9	1.1	0.6	0.9	1.9	1.1	1.40
Hotels	4.7	3.9	4.9	7.2	6.5	6.5	11.2	9.6	8.0	11.0	9.4	8.70
Miscellaneous	11.6	12.4	12.9	13.7	13.1	13.9	16.2	18.5	18.6	20.1	24.2	24.60
	100.0	99.9	100.0	100.1	100.0	100.1	99.8	99.9	100.0	100.2	99.8	99.9

Estimates of the Cost of a Child in Ireland

Table 9: Expenditure shares according to family composition and expenditure status in 1999

	Quartile 1			Quartile 2			Quartile 3			Quartile 4		
	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children
Food	29.9	32.7	33.5	19.5	21.7	25.6	15.4	16	18.8	11	12.6	13.8
Alcohol	0.6	0.5	0.4	1.3	0.9	1	1.3	0.8	1.2	1.4	1.2	1.3
Tobacco	4.8	6.8	6.1	3.7	4	3.1	2.4	2.2	1.8	1.1	1.3	0.8
Clothing	2.6	2.1	3.8	3.9	5.2	5.6	4.5	5.2	6.3	4.9	6.7	6.6
Housing	16.5	18	15.3	14.9	14	11.5	11.6	11.9	11.2	10.3	8.9	8.9
Furnishing	5.7	3.8	5.5	5.6	5.5	5.4	6	6.2	5.4	5.3	6.7	6.8
Health	0.9	0.8	0.4	2.1	2.8	1.7	2	2.5	2.5	1.5	2.4	2.3
Transport	11.8	10.7	11.1	15.1	13.4	15	15.8	16.3	14.8	17.3	14.9	13.9
Communications	3.9	3	3.6	3.4	3.2	2.8	3.3	2.7	2.4	2.6	2	2.1
Recreation	5.4	4.5	5.3	7.6	6.4	6.3	8.7	7.5	7.7	10.8	8.4	10.3
Education	1	1	0.5	1	0.5	0.6	1.3	0.6	0.8	1.9	0.8	1
Hotels	5.9	5.9	3.9	8.7	7.2	7.4	10	8.3	7.6	10.5	8.3	7.7
Miscellaneous	11	10.2	10.7	13.1	15.2	14	17.8	19.8	19.6	21.3	25.9	24.6
	100	100	100.1	99.9	100	100	100.1	100	100.1	99.9	100.1	100.1

Estimates of the Cost of a Child in Ireland

Table 10: Expenditure shares according to family composition and expenditure status in 2004

	Quartile 1			Quartile 2			Quartile 3			Quartile 4		
	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children	Childless Couple	Couple with one Child	Couple with two Children
Food	25.0	25.9	21.6	17.7	16.2	20.5	13.6	13.6	16.7	10.7	11.3	13.6
Alcohol	2.2	0.6	1.3	1.8	1.4	1.5	1.9	1.5	1.5	1.7	1.3	1.6
Tobacco	5.2	6	2.3	2.7	2.5	2.1	1.7	1.7	1.5	0.7	1	0.7
Clothing	5.6	5.6	3.7	3.8	4.6	5	4.7	5.1	5.5	5.4	5.9	5.8
Housing	15.9	18.9	16.9	14.2	18.3	16.3	12.9	12.2	11.1	9.7	9.7	9.7
Furnishing	5.6	4.3	4.4	5	5.7	4.6	4.6	5.5	4.4	5.5	5.6	5.4
Health	1.5	0.6	1.4	3.2	3.1	2.2	2.7	1.8	2.9	2.6	2.6	2.1
Transport	9.4	11	15.8	14.1	16	13.7	15.4	16.1	14.6	15.9	14.8	13.5
Communications	4.6	6.2	3.8	4.7	4.6	4.4	4.1	4.4	4	3.7	3.4	2.8
Recreation	8.3	6.7	9	9.8	6.6	9.7	9.7	9.4	10.7	10.7	8.4	10.5
Education	0.1	0.1	1.1	1	0.9	0.9	1.3	0.8	1.4	1.4	1.6	1.7
Hotels	5.5	5.6	5.1	8.3	6.3	6.3	8.8	8.2	7.1	10.2	7.9	6.8
Miscellaneous	11	8.5	13.5	13.5	13.8	12.9	18.5	19.7	18.6	21.8	26.3	25.9
	99.9	100.0	99.9	99.8	100.0	100.1	99.9	100.0	100.0	100.0	99.8	100.1

Estimates of the Cost of a Child in Ireland

Table 11a: Engel equivalence scales based on food

Number of Children				
	1987	1994	1999	2004
Single Adult	0.75	0.74	0.75	0.73
Single Parent with 1 Child	0.92	0.94	0.95	0.96
Single Parent with 2 Children	1.13	1.19	1.122	1.27
Couple	1.00	1.00	1.00	1.00
Couple with 1 Child	1.23	1.26	1.28	1.32
Couple with 2 Child	1.51	1.60	1.63	1.74

Table 11b: Engel equivalence scales based on broader categories

Number of Children				
	1987	1994	1999	2004
Single Adult	0.73	0.76	0.78	0.74
Single Parent with 1 Child	0.86	0.93	0.95	0.92
Single Parent with 2 Children	1.03	1.13	1.16	1.14
Couple	1.00	1.00	1.00	1.00
Couple with 1 Child	1.19	1.22	1.22	1.23
Couple with 2 Child	1.42	1.49	1.48	1.52

Estimates of the Cost of a Child in Ireland

Table 12a: Engel equivalence scales based on food

Age of Children	1987	1994	1999	2004
Single Parent with 1 Child aged 0 - 5 years	0.84	0.82	0.85	0.85
Single Parent with 1 Child aged 5 - 13 years	0.91	0.92	0.94	0.93
Single Parent with 1 Child aged 14 -20 years	0.92	0.93	0.96	0.95
Single Parent with 2 Children aged 0 - 5 years	0.96	0.93	0.97	1.00
Single Parent with 2 Children aged 5 - 13 years	1.10	1.16	1.18	1.19
Single Parent with 2 Children aged 14 -20 years	1.12	1.17	1.23	1.25
Couple	1.00	1.00	1.00	1.00
Couple with 1 Child aged 0 - 5 years	1.17	1.15	1.17	1.20
Couple with 1 Child aged 5 - 13 years	1.26	1.29	1.30	1.31
Couple with 1 Child aged 14 -20 years	1.27	1.30	1.33	1.35
Couple with 2 Children aged 0 - 5 years	1.33	1.31	1.33	1.42
Couple with 2 Children aged 5 - 13 years	1.53	1.62	1.63	1.68
Couple with 2 Children aged 14 -20 years	1.55	1.64	1.70	1.76

Table 12b: Engel equivalence scales based on broader categories

Age of Children	1987	1994	1999	2004
Single Parent with 1 Child aged 0 - 5 years	0.78	0.85	0.93	0.92
Single Parent with 1 Child aged 5 - 13 years	0.85	0.95	0.96	0.89
Single Parent with 1 Child aged 14 -20 years	0.95	1.00	1.02	1.02
Single Parent with 2 Children aged 0 - 5 years	0.85	0.95	1.09	1.12
Single Parent with 2 Children aged 5 - 13 years	0.99	1.16	1.15	1.04
Single Parent with 2 Children aged 14 -20 years	1.23	1.27	1.28	1.37
Couple	1.00	1.00	1.00	1.00
Couple with 1 Child aged 0 - 5 years	1.10	1.12	1.19	1.24
Couple with 1 Child aged 5 - 13 years	1.20	1.26	1.23	1.20
Couple with 1 Child aged 14 -20 years	1.34	1.32	1.30	1.38
Couple with 2 Children aged 0 - 5 years	1.20	1.25	1.39	1.51
Couple with 2 Children aged 5 - 13 years	1.40	1.53	1.47	1.41
Couple with 2 Children aged 14 -20 years	1.74	1.67	1.65	1.85

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Table 13a: Engel equivalence scales based on food

Gender of Children	1987	1994	1999	2004
Single Parent with 1 boy	0.89	0.90	0.92	0.90
Single Parent with 1 girl	0.85	0.86	0.89	0.89
Single Parent with 2 boys	1.09	1.13	1.16	1.16
Single Parent with 2 girls	1.01	1.05	1.08	1.12
Couple	1.00	1.00	1.00	1.00
Couple with 1 boy	1.23	1.26	1.27	1.28
Couple with 1 girl	1.18	1.21	1.22	1.26
Couple with 2 boys	1.51	1.59	1.61	1.64
Couple with 2 girls	1.40	1.47	1.50	1.58

Table 13b: Engel equivalence scales based on broader categories

Gender of Children	1987	1994	1999	2004
Single Parent with 1 boy	0.88	0.94	0.95	0.91
Single Parent with 1 girl	0.85	0.92	0.95	0.94
Single Parent with 2 boys	1.07	1.15	1.16	1.10
Single Parent with 2 girls	0.99	1.11	1.16	1.17
Couple	1.00	1.00	1.00	1.00
Couple with 1 boy	1.22	1.23	1.22	1.21
Couple with 1 girl	1.17	1.21	1.21	1.25
Couple with 2 boys	1.48	1.52	1.48	1.47
Couple with 2 girls	1.37	1.46	1.47	1.56

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Table 14b: Engel equivalence scales based on food

Gender and Age of Children	1987	1994	1999	2004
Single Parent with 1 boy aged 0-5 years	0.83	0.82	0.85	0.83
Single Parent with 1 boy aged 5-13 years	0.89	0.91	0.92	0.90
Single Parent with 1 boy aged 14-20 years	0.92	0.92	0.95	0.96
Single Parent with 1 girl aged 0-5years	0.82	0.81	0.81	0.84
Single Parent with 1 girl aged 5-13years	0.87	0.88	0.91	0.91
Single Parent with 1 girl aged 14-20years	0.85	0.88	0.91	0.90
Couple	1.00	1.00	1.00	1.00
Couple with 1 boy aged 0-5 years	1.15	1.14	1.17	1.18
Couple with 1 boy aged 5-13 years	1.23	1.28	1.27	1.27
Couple with 1 boy aged 14-20 years	1.27	1.28	1.31	1.36
Couple with 1 girl aged 0-5years	1.13	1.13	1.12	1.19
Couple with 1 girl aged 5-13years	1.20	1.23	1.25	1.29
Couple with 1 girl aged 14-20years	1.18	1.23	1.25	1.27

Table 14b: Engel equivalence scales based on broader categories

Gender and Age of Children	1987	1994	1999	2004
Single Parent with 1 boy aged 0-5 years	0.77	0.83	0.93	0.92
Single Parent with 1 boy aged 5-13 years	0.83	0.95	0.95	0.84
Single Parent with 1 boy aged 14-20 years	0.95	0.96	0.96	0.98
Single Parent with 1 girl aged 0-5years	0.77	0.85	0.89	0.88
Single Parent with 1 girl aged 5-13years	0.82	0.90	0.92	0.90
Single Parent with 1 girl aged 14-20years	0.87	0.96	1.01	1.00
Couple	1.00	1.00	1.00	1.00
Couple with 1 boy aged 0-5 years	1.09	1.09	1.19	1.24
Couple with 1 boy aged 5-13 years	1.18	1.25	1.22	1.14
Couple with 1 boy aged 14-20 years	1.35	1.27	1.23	1.33
Couple with 1 girl aged 0-5years	1.09	1.12	1.15	1.19
Couple with 1 girl aged 5-13years	1.16	1.19	1.18	1.22
Couple with 1 girl aged 14-20years	1.24	1.27	1.29	1.34

Estimates of the Cost of a Child in Ireland

Table 15a: Engel equivalence scales based on food

	1987			1994		
Household Expenditure Level	25 th Percentile	Median	75 th Percentile	25 th Percentile	Median	75 th Percentile
Single Parent with one Child	0.98	0.95	0.92	1.01	0.97	0.93
Single Parent with two Children	1.24	1.17	1.11	1.33	1.22	1.14
Couple	1.00	1.00	1.00	1.00	1.00	1.00
Couple with one Child	1.29	1.25	1.21	1.34	1.28	1.24
Couple with two Children	1.61	1.52	1.43	1.71	1.58	1.47

Table 15a continued

	1999			2004		
Household Expenditure Level	25 th Percentile	Median	75 th Percentile	25 th Percentile	Median	75 th Percentile
Single Parent with one Child	1.02	0.98	0.94	1.03	0.99	0.95
Single Parent with two Children	1.34	1.27	1.15	1.38	1.28	1.20
Couple	1.00	1.00	1.00	1.00	1.00	1.00
Couple with one Child	1.35	1.29	1.24	1.38	1.32	1.28
Couple with two Children	1.72	1.59	1.48	1.80	1.67	1.57

Estimates of the Cost of a Child in Ireland

Table 15b: Engel equivalence scales based on broader categories

	1987			1994		
Household Expenditure Level	25 th Percentile	Median	75 th Percentile	25 th Percentile	Median	75 th Percentile
Single Parent with one Child	0.95	0.96	0.96	1.03	1.02	1.01
Single Parent with two Children	1.12	1.13	1.14	1.25	1.23	1.20
Couple	1.00	1.00	1.00	1.00	1.00	1.00
Couple with one Child	1.17	1.18	1.18	1.22	1.21	1.20
Couple with two Children	1.37	1.39	1.41	1.48	1.45	1.42

Table 15b continued

	1999			2004		
Household Expenditure Level	25 th Percentile	Median	75 th Percentile	25 th Percentile	Median	75 th Percentile
Single Parent with one Child	1.06	1.04	1.03	1.08	1.04	1
Single Parent with two Children	1.29	1.25	1.21	1.34	1.24	1.15
Couple	1.00	1.00	1.00	1.00	1.00	1.00
Couple with one Child	1.23	1.21	1.19	1.28	1.23	1.18
Couple with two Children	1.49	1.43	1.39	1.57	1.46	1.35

Estimates of the Cost of a Child in Ireland

Table 16: Equivalent scale using different methodologies – estimates

		1 Child	2 Children
Henman (2005)	Budget Standards approach (modest but adequate)	1.23	1.46
	Engel		
Lancaster and Ray (1998)	Food	1.21	1.45
Tran Nam and Whiteford (1990)	Food	1.29	1.66
Van der Ven (2003)	Food	1.24	1.50
Percival and Harding (2005)	Basket of Goods	1.15	1.26
Tran Nam and Whiteford (1990)	Basket of Goods	1.25	1.57
	Rothbarth		
Bradbury (1994)		1.16	1.28
Lancaster and Ray 1998	Adult clothing	1.15	1.32
Van der Ven (2003)	Food outside the home	1.06	1.18
	Demand systems		
Lancaster and Ray (1998)	Barten AIDS	1.08	1.16
Lancaster & Ray 98	Price scaled AIDS	1.21	1.42
Lancaster & Ray 98	Price scaled LES	1.12	1.24
Lancaster & Ray 98	Price scaled GAIDS	1.12	1.23
Valenzuela (1999)	ELES	1.18	1.25
Tran Nam and Whiteford 1(990)	ELES	1.20	1.27
Van der Ven (2003)	Demand system-fixed price effects	1.18	1.36
Van der Ven (2003)	Demand system-demographic dependent price	1.12	1.26

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	effects		
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Note: AIDS = Almost Ideal Demand System, LES = Linear Expenditure System, GAIDS = Generalised Version of Almost Ideal Demand System, ELES = Extended Linear Expenditure System.

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