

**Into the Great Wide  
Unknown: Untangling  
the Relationship  
between Childcare  
Service Use and In-  
Work Poverty**

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# Into the Great Wide Unknown: Untangling the Relationship between Childcare Service Use and In-Work Poverty

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## ABSTRACT

In the literature on in-work poverty (IWP), childcare services are often assumed to be an effective policy instrument in reducing the number of working poor. However, such assumption has never been properly put to the test. This chapter provides, for the first time, empirical evidence on the role of childcare services in combating in-work poverty. First, a conceptual overview of the pathways through which childcare service use is expected to reduce in-work poverty. Second, a comprehensive overview of the literature on the employment effects of childcare use is provided. Third, drawing on the 2012 wave of the European Union Statistics on Income and Living Conditions (EU-SILC), the link between using formal childcare and IWP is examined at both the micro and the macro level. The results provide evidence for an aggregation paradox: there is no link between the level of formal childcare use and the IWP rate at the country level, while using childcare at the household level is related to a lower risk of being working poor. This can be explained by the fact that families using formal care are also families with higher levels of work intensity. Finally, we argue that the type of care matters much as we find that informal care arrangements are related to higher levels of IWP.

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## 1 Introduction

In the literature on in-work poverty (IWP) childcare services are often assumed to be an effective policy instrument in reducing the number of working poor. The alleged link between childcare and IWP is pretty straightforward: the availability and affordability of childcare services is expected to increase both the number of working families and the number of earners per household, which subsequently should result in lower IWP rates (Lohmann, 2009; Ive Marx & Verbist, 2008).

For that reason, Ive Marx and Nolan (2014) include childcare policies in their 'policy toolbox' to address IWP. As of yet, however, the link between childcare and IWP has not been empirically substantiated.

In an oft-cited article, Lohmann (2009) tests the assumption that childcare services increase the number of earners per household by relating spending on family services to pre-transfer IWP rates across European countries. The underlying logic is that the more countries spend on childcare services, the more families will be employed and the lower the in-work poverty rates will be *before* the welfare state steps in. Drawing on multilevel regression models, Lohmann does not find evidence for that assumption, however: the relationship between pre-transfer poverty and spending on family services is not significant. In a similar vein, Spannagel (2013) relates the availability of public childcare to IWP rates across European countries and finds no significant relationship.

It should be noted here that although both studies regard childcare as an aggregated country-level variable, they operationalize it in different ways. In Lohmann's study, spending on family services is regarded a proxy for the availability of childcare services while Spannagel operationalizes public childcare as the average hours of childcare use per week for children between 3 and 5 year old. Still, both approaches fail to show a significant relationship. In contrast, Crettaz (2011) shows empirically that family policy, albeit broadly understood, has an impact on the incidence of working poverty in four countries, which he regards as being *indirect evidence* for the antipoverty effect of childcare policies.

None of these studies have *directly* examined the impact of childcare use on IWP. Given this, Crettaz unsurprisingly concludes that "very little evidence has been published on the anti-poverty effects of childcare" (2011: 145). Our aim in this chapter is to provide, for the first time, empirical evidence on the role of childcare services in combating in-work poverty. Drawing on the 2012 wave of the European Union Statistics on Income and Living Conditions (EU-SILC), we will empirically examine the link between childcare service use and the risk of being working poor.

It is important to mention that we adhere to the EUROSTAT definition of IWP in this chapter (see chapter 2 by Lohmann in this book). Hence

poverty is measured at the level of the household, while employment refers to the labour market status of the individual. This peculiar feature of the definition of IWP has important implications for understanding the role of public policies in general and childcare service use in particular in reducing IWP (see also: Halleröd, Ekbrand, & Bengtsson, 2015), as shall be discussed at length in this chapter.

The results provide evidence for a so-called aggregation paradox. We find no relationship between formal childcare usage and IWP at the country level, while we do find that using formal childcare is related to a reduced risk of IWP at the individual level. The reason for this is that formal care use is associated with a higher household work intensity in many European countries. Although both formal and informal care arrangements presumably support high levels of work intensity, we find important differences in their impact on the risk of being working poor. In fact, informal care seems to be related with a higher IWP risk among parents. Unlike formal care arrangements, informal care seems incompatible with attaining full-time, stable jobs.

The chapter is structured as follows. First, we provide a conceptual overview of the pathways through which childcare service use might impact on IWP rates. Second, we relate these pathways to discuss the scientific literature on the relationship between childcare and employment. In the third section we engage in empirical analyses exploring the association between childcare use and IWP. Finally, we will discuss whether childcare services should be regarded an effective policy instrument in reducing the number of working poor, and identify some avenues for further research.

## **2 The relationship between childcare and in-work poverty: conceptual issues**

Hitherto, the view held in the IWP literature is that the availability and affordability of childcare services will increase the number of earners per household, in particular the number of working mothers, since childrearing is still overwhelmingly a women's affair (Uunk, Kalmijn, & Muffels, 2005). This is expected to result in lower IWP rates, since it is well-established that the risk of poverty is low for workers living in multi-earner households. Yet, not only is the assumption that the availability of childcare services increases the labour market attachment of mothers not uncontested, as we shall see, the intuitive causal link between more earners and less IWP is arguably ill-advised because it neglects the complex interrelations between a multitude of factors that are related to the problem of in-work poverty.

In this section, we discuss the myriad ways childcare services might have an impact on IWP from a conceptual point of view. For clarity, we draw on a two-dimensional framework referring to 1) the level of analysis, making

a distinction between the potential impact of childcare services on IWP at the *micro* (household) level and at the *macro* (aggregated, country) level; and 2) the mechanisms through which the actual use of formal childcare translates into IWP rates. In subsequent sections, we will relate these theoretical insights to actual data, trying to shed some empirical light on the way childcare affects IWP.

Let us first clarify why it is important to distinguish between the micro and the macro level relationship. From a policy point of view, the macro level relationship between childcare and IWP is the most relevant (because reducing IWP *rates* in general and of working parents in particular is presumably what a policymaker would like to achieve). However, to avoid committing an ecological fallacy and to gauge the *genuine* impact of childcare on the risk of IWP, the relationship between both should be assessed separately at the micro and the macro level and should focus on the actual use of childcare services instead of aggregated measures of availability or spending.

Suppose we take for granted the intuitive causal mechanism that childcare services reduce IWP of parents because they facilitate paid employment. At the micro level, then, the alleged relation is straightforward:

For a single earner couple living in poverty turned two-earner couple when using childcare, the additional income might push them over the poverty threshold. However, from a micro-level negative association between childcare use and IWP it cannot be inferred that the country-level association between childcare use rates and IWP rates will be negative as well. In contrast, the relationship at the country-level might even be positive, implying that a higher share of childcare service use coincides with higher IWP rates.

Such change in the direction of the association after aggregation is referred to as an aggregation paradox (see Nieuwenhuis, 2014 for further reading on this issue). Poverty outcomes are influenced by many factors, and it could be the case that confounding variables are causing an aggregation paradox to appear.

First of all, since IWP is measured at the level of the household as a percentage of median household income, the association of childcare service use with IWP rates at the macro level will be dependent on (1) where in the income distribution workers with young children that use childcare services are to be found; which in turn is related to (2) the composition of the households using childcare. If the majority of workers with young children being able to engage in paid employment due to the use of childcare services are living in breadwinner families and, hence, single earner families become dual earner families, this may push up median income and increase the number of workers in other family types below the poverty threshold (I Marx, Vandenbroucke, & Verbist, 2012).

This means that while the micro level relationship will be negative (a single earner household is being pushed over the poverty line due to the additional income), the macro level relationship might be positive (more childcare use is associated with higher IWP rates). However, if employment gains are concentrated instead among single parents who find themselves at the bottom of the income distribution, both the micro and the macro-level relationship will be negative, *ceteris paribus*. Obviously, the two phenomena may occur together; in that case the overall macro-level relationship between childcare services and IWP will be dependent on the share of the single parents and couples with children affected. Hence *confounder 1*: which families benefit from childcare services?

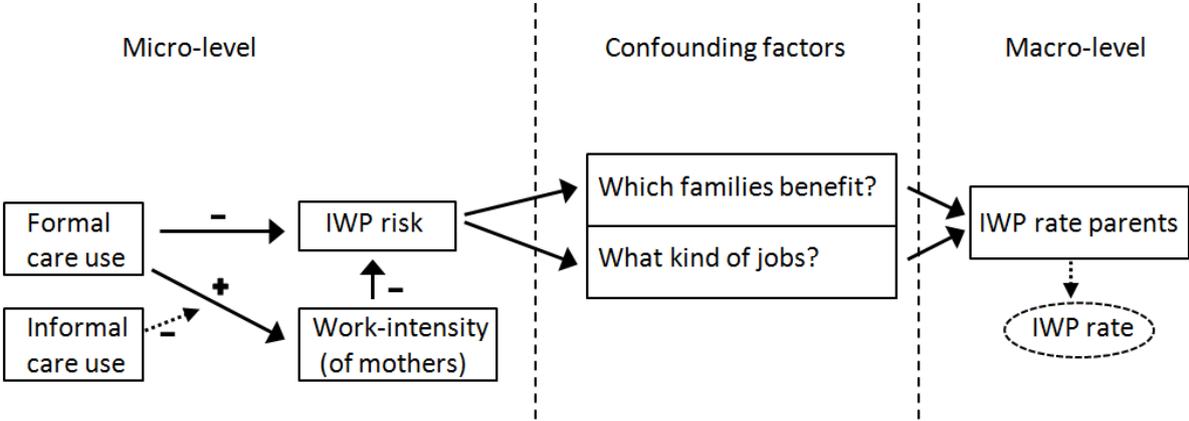
Second, complicating the matter is the role of earnings. The risk of being a poor worker is not only determined by having a job or not, but also by the returns to that job (Andress & Lohmann, 2008). If childcare services facilitate paid employment amongst poor jobless people, to escape poverty these people require wages and work-attachment that are sufficiently high. If wages or the degree of work do not allow to surpass the poverty threshold, childcare services will have no impact at the micro level (poor families remain poor) while the relationship at the macro level might turn positive (the number of working people in poverty increases). This will be related to the types of jobs available to people and the distribution of these jobs over the workforce. E.g. non-standard work arrangements such as temporary employment and part-time employment are associated with an hourly wage penalty and fewer working hours per week (Horemans & Marx, 2013; Horemans, Marx, & Nolan, 2016; Van Lancker, 2012, 2013b). However, this depends on whether the available childcare services are aligned with job accessibility. Childcare services operating on a part-time basis do not facilitate full-time work, unless informal care is available, while flexible jobs require flexible opening hours of care services. Both childcare service characteristics and labour demand influence the macro-level relationship. *Confounder 2*: the country-level relationship between childcare service use and IWP might be influenced by the kind of jobs that are available and feasible.

Here too, family composition is an important factor (*confounder 1*). For people living in single breadwinner families, the additional income necessary to escape poverty might be quite limited, and a low wage or nonstandard job may suffice. For a non-working single parent family or a non-working couple, attaining one job that pays a decent wage will not necessarily suffice to lift them out of poverty. In that case, using childcare might not help to escape poverty at the micro level (a poor family is still poor), while at the macro level the relationship between childcare use and IWP could turn positive (more workers are poor), *ceteris paribus*.

Finally, the impact of childcare use will be influenced by the availability of informal care arrangements. From an IWP perspective, it does not matter

whether children are cared for by grandparents or relatives or in formal care services as long as paid employment is facilitated to the same extent. If workers with young children substitute informal for formal childcare arrangements, for instance when governments start to invest in public childcare, the impact at both the micro and the macro level could be zero. Obviously, interaction effects will be important here as well, because families could choose to combine informal and formal care arrangements, for instance to facilitate nonstandard work (confounder 2), while its impact will be dependent on the place of these families in the income distribution (confounder 1).

Scheme 15.1 Overview of mechanisms that impact on the relationship between childcare use and IWP rates



Lastly, and stating the obvious, childcare is relevant only to families with young children. Able-bodied adults living in families with young children are only a subset of the workforce. As a consequence, *even if* childcare services would reduce IWP amongst all workers with young children, that would not necessarily show at the macro level for all workers. IWP levels of workers without children or workers with older children could neutralize or even offset the impact of childcare services on workers with young children.

In short, the expected impact of childcare service use on IWP of parents and IWP in general works through an increase in the number of earners with young children, but whether such increase translates into lower IWP rates at the country level depends on 1) the types of families affected and their position in the income distribution, and 2) the nature of and returns to the jobs that are accepted. Scheme 1 gives an overview of the different channels through which formal childcare use relates to IWP.

### **3 Childcare use and maternal employment: a review of the evidence**

The relationship between childcare and IWP hinges first and foremost on the assumption that childcare service use will increase the number of earners within and across households.

Many studies have shown that having children is associated with reduced maternal labour supply. Mothers continue to bear a disproportionate share of the burden of child-rearing across developed welfare states (Budig & England, 2001; Uunk et al., 2005). Without the possibility of externalizing care duties, they are often unable to engage in paid employment. In the absence of decent formal or informal care provisions, women cut back on their working hours or quit the labour force altogether (Korpi, Ferrarini, & Englund, 2013; Uunk et al., 2005). As a result, the extent to which family policies are able to reduce this motherhood penalty have been studied extensively, with the affordability and availability of formal childcare services as central tenets of the debate. In this section we review the body of literature studying the effect of formal childcare services on maternal employment.

It has been shown that the availability of formal care services correlates strongly with female and maternal labour market participation across EU and OECD countries (Jaumotte, 2003; Van der Lippe & Van Dijk, 2002). Boeckman, Misra, and Budig (2014), for example, show that higher levels of publicly supported childcare use is associated with a lower motherhood employment penalty, both at the extensive and intensive margins, and tends to be particularly relevant for mothers with young children.

Since correlation does not imply causation, several empirical studies have tried to gauge the *effect* of childcare use on maternal labour supply.

The earliest studies were mostly US-based and exploited variation in childcare costs to estimate the effect on female employment using regression methods (e.g. Blau & Robins, 1991; Connelly, 1992; see Müller, Sengül, & Wrohlich, 2015 for an overview). These studies invariably indicate that mothers' decision to take on employment is sensitive to childcare costs, albeit to different degrees with estimates ranging from -0.025 to -1.1, clustering around -0.25 (Morrissey 2016). In a recent meta-analysis, Akgunduz and Plantenga (2015) calculate a mean childcare price elasticity for labour supply of -0.35 for US and Canadian studies, indicating that a 10% reduction in the price of childcare is associated with a 3.5% increase in maternal employment.

Child care prices also seem to affect employment decisions at the intensive margins: estimated elasticities of hours worked range from -0.01 to -0.78 (Kalb, 2009), but the majority of studies yield elasticities lower than 0.1 in absolute value (Crettaz, 2011).

More recent inquiries indicate that childcare costs are in particular important in interaction with availability of childcare services, and that

primarily the latter determines childcare use. Especially in European countries, where childcare is often heavily subsidized and regulated but rationed (Del Boca & Pasqua, 2005; Vandellannoote et al. 2015; Wrohlich, 2011), price elasticities are typically smaller (Akgunduz & Plantenga, 2015; Bettendorf, Egbert, & Muller, 2015; Lundin, Mörk, & Öckert, 2008). According to Del Boca (2015) additional price reductions have little impact on (female) labour supply in child care systems that reach the majority of parents, which might explain why recent elasticities for the U.S. tend to be lower as well (Morrisey, 2016).

In recent years, an increasing number of studies have exploited policy changes as a natural experiment, which allows to more reliably estimate the causal impact of changes in the availability and cost of formal childcare services on maternal labour supply. Evidence from these studies is less unequivocal regarding the employment effects compared to the results emerging from regression-based analysis. Exploiting policy changes in Germany (Bauernschuster & Schlotter, 2015) and Spain (Nollenberger & Rodríguez-Planas, 2015) find significant employment effects. Importantly, however, the latter study shows that the impact of childcare expansion has been heterogeneous since it only lasting for high skilled mothers. Others do not find strong employment effects mainly because new childcare usage was accounted for by working mothers who previously relied on informal care (Baker, Gruber, & Milligan, 2008; Bettendorf et al., 2015; Havnes & Mogstad, 2011; Lefebvre & Merrigan, 2008). These findings are testimony to a potential distortion of the direct relation between formal care use and an increased labour supply, and consequently modify the assumption of a strong relationship between formal childcare use and IWP. These findings are testimony to the importance of informal care as a pathway through which the relationship between formal childcare use and IWP is mediated.

Who benefits from childcare expansion (confounder 1) very much depends on the country-specific childcare practises, local labour market conditions, norms on motherhood, and other circumstances (e.g. Havnes & Mogstad, 2011). Anderson and Levine (2000) and Akgunduz and Plantenga (2015) point to heterogeneity in the elasticities across different family types: most studies find larger elasticities for single parents and for low income families, and for working mothers compared with non-working mothers (for an overview, see Morrisey, 2016; Müller et al., 2015).

On the other hand, Havnes and Mogstad (2011) demonstrate that in particular the well-off benefit most, because in particular mothers with a working spouse tend to enter the labour market. In countries where availability is rationed even after expansion, primarily mothers close to the labour market will benefit.

Recent inquiries into the use of childcare services amongst families with children below 3 years old indeed show a bias in favour of advantaged

families (Van Lancker, 2013a; Van Lancker & Ghysels, 2012). It has also been meticulously documented how the increase in female labour market participation observed over the past decade has been a socially stratified process, with low-skilled women participating to a much smaller extent than their higher-educated counterparts (Cantillon et al. 2001; Evertsson et al., 2009; Konietzka & Kreyenfeld, 2010). Inequities in childcare use as well as inequities in maternal employment will likely have an impact on the relationship between childcare use and IWP.

More generally, the relationship between childcare service use and maternal employment is not easily gauged in isolation. Maternal employment decisions are the result of a complex interplay between a variety of policies (Gornick & Meyers, 2005; jaumotte, 2003). Public financed child-care, well-paid parental leave, part-time employment, public sector employment and gender neutral taxation are typically found to *simultaneously* associated with an increased labour force participation of mothers (Kenworthy, 2008; Mandel & Semyonov, 2003; Nieuwenhuis, Need, & Van der Kolk, 2012). Furthermore, it is widely accepted that cross-national differences in the employment rates of mothers are caused by the interplay between policy or institutional factors, cultural differences regarding the women's caring role, and economic circumstances (Haas, Steiber, Hartel, & Wallace, 2006; Uunk et al., 2005).

In the previous section we argued that the link between childcare use and IWP might be much more ambiguous and complex than one would expect from the intuitive causal link between increasing maternal employment and reducing IWP. The results from previous studies confirm that there is no a priori reason to assume that childcare use will *necessarily* lead to more earners across households. Moreover, given the heterogeneity of the results in terms of families affected (confounder 1), its strong link with the labour market and the kind of jobs that are being done (confounder 2), one cannot assume childcare service use to have a clear, unequivocal impact on IWP rates *even if* they are helpful in increasing maternal employment.

Let us now turn to the empirical relationship between childcare use and IWP.

## **4 Empirical analysis**

### **4.1 Data, definition and methods**

Data are drawn from the European Union Statistics on Income and Living Conditions (EU-SILC). In-work poverty measurement follows the Eurostat approach for both defining 'in-work' and 'poverty' (see chapter 2 by Lohmann), and we focus on active age workers (18 to 64 years old).

With regards to the measurement of childcare use, we make a distinction between formal childcare services (care centres, nursery schools,

professional child minders and family daycare providers) and informal care arrangements (grandparents, relatives and friends). Research in this area (e.g. Van Lancker 2013) often employs a child-perspective in measuring childcare use, meaning that the number of children enrolled in formal childcare services is counted as a percentage of all children of the same age. Usually the focus is on the youngest children aged 0 to 2, allowing for comparison of homogenous groups, something that is not possible for children over the age of three as the role of educational household level, we adopt a household perspective in measuring childcare use in this chapter. This means that we do not measure the number of young children in formal care services, but the number of households with at least one child below the age of 3 using formal care. 'Childcare use' hence is the percentage of household with young children where at least one child below 3 is enrolled in formal care. As a sensitivity check, we also take into account the intensity of use by calculating childcare use in full-time equivalents (FTE)<sup>1</sup>. The latter expresses the proportion of children who would be receiving child care if all existing care use was full-time (30 hours per week or more). Informal care is measured in the same way.

In the remaining part of this chapter, we will map the empirical relationship between childcare use and IWP across European countries from both a micro and macro level perspective. Subsequently, we will gauge the importance of some of the confounding mechanisms mediating the relationship between childcare use and IWP.

In doing so, we will assess how formal childcare use and work intensity at the household level are related to each other. Following the Eurostat approach, work-intensity is defined as the ratio of the total number of months that all working-age household members have worked during the income reference year and the total number of months the same household members theoretically could have worked in the same period<sup>2</sup> (Ward & Ozdemir, 2013).

## **4.2 Childcare use and IWP**

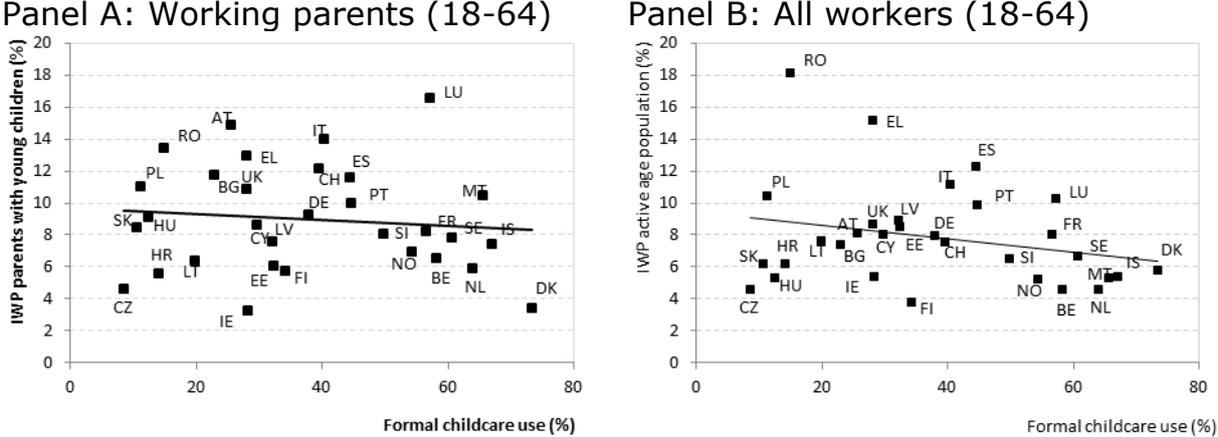
In this section we empirically examine the relationship between childcare use and IWP. Figure 1 shows the country-level associations between formal childcare use amongst households with young children and IWP among parents (panel A) and IWP for the active age population (panel B). The figures show that in the majority of Central and Eastern European countries less than 20% of families with young children use formal childcare services. In contrast, in the Scandinavian countries (without Finland), in the continental countries (without Germany), and in Malta, more than half of these families rely on formal childcare services.

Panel A shows that there is basically no relationship between formal childcare use and IWP amongst parents with young children ( $r = -0.10$ ) while panel B shows a negative relationship ( $r = -0.25$ ), which means that

a higher share of households with young children using formal childcare tends to go together with lower IWP rates *in general*. This association seems to be driven by the high rates of IWP amongst working persons without children or with older children in Romania and Greece (r = -0.12 without these outliers).

The lack of a significant association is in line with the findings from previous attempts at estimating an effect of childcare on IWP rates (Lohmann, 2009). These figures are also consistent when using alternative indicators (appendix 1), and additional analyses (results not shown) demonstrate that the correlations remain similar when controlling for GDP in PPP, employment rates, and unemployment rates. Finally, using information on year-to-year changes (2006-2012) we did not find a significant correlation between changes in childcare use and changes in IWP rates (r = .09): it is not the case that an increase in childcare use *necessarily* goes together with a decrease in the number of working poor.

Figure 15.1 *Formal childcare use among adults with young children (age < 3) and IWP rate of parents and IWP rate of active age population, European countries, 2012*



Source: own calculations on EU-SILC 2012.

We have argued throughout this chapter that while the macro-level relationship is what matters from a policy point of view, it does not allow assessing whether childcare use is genuinely associated with a lower risk of being working poor, hence whether it should be included in a policymakers toolbox for combating in-work poverty. Ideally we would like to draw on longitudinal data that allows for estimating the impact of the *transition* from home care or informal care to formal childcare, and its subsequent impact on employment patterns and poverty risk; unfortunately, such data is not available at the moment for a large number of European countries.

Drawing on cross-sectional data, a second best option is to use logistic regression to examine whether the poverty risk differs significantly between workers using formal childcare services and workers using no care or other types of care. Although causality cannot be inferred, this would at least suggest that the *use* of formal childcare is associated with employment conditions sufficient to stay out of poverty. Moreover, adding controls allows to test whether the relationship between formal childcare use and IWP indeed runs through household work intensity as we discussed in section §2.

Table 1 shows the results of logistic regression models estimating the effect of using formal childcare on the probability of being poor for working parents at the micro level for all countries separately.

The table reports average marginal effects (AME) which should be interpreted as the percentage point difference in the risk of being poor for a working parent using formal childcare compared with a working parent not using formal care. Model 1 presents estimates without controls, Models 2 and 3 control respectively for individual and household work-intensity, and Model 4 simultaneously controls for sex, age, educational, whether informal care is being used, as well as individual and household work-intensity, and individual earnings.

Table 15.1 *Average marginal effects of formal childcare use by working parents on IWP*

	Model 1		Model 2		Model 3		Model 4	
AT	0.00		0.00		0.00		0.02	
BE	-0.08	***	-0.08	***	-0.02		-0.02	
BG	-0.09	**	-0.09	**	-0.07	*	-0.08	*
CH	-0.10	***	-0.10	***	-0.07	**	-0.04	
CY	-0.11	***	-0.11	***	-0.07	**	-0.06	
CZ	-0.01		-0.01		-0.01		-0.00	
DE	-0.06	**	-0.06	**	-0.05	**	-0.05	
DK	-0.01		-0.01		0.00		-0.01	
EE	-0.02		-0.02		0.01		0.04	
EL	-0.09	*	-0.09	*	-0.03		-0.04	
ES	-0.11	***	-0.10	***	-0.07	***	-0.03	
FI	-0.07	***	-0.07	***	-0.04	**	-0.02	
FR	-0.12	***	-0.12	***	-0.05	***	-0.03	*
HR	-0.07	**	-0.07	**	-0.05		-0.01	
HU	-0.06	*	-0.06	*	-0.02		-0.01	
IE	-0.04	**	-0.04	*	-0.02		-0.01	
IS	0.00		0.00		0.01		-0.01	
IT	-0.06	*	-0.06	***	-0.03	*	-0.02	
LT	-0.03		-0.03		-0.02		-0.02	
LU	-0.11	***	-0.11	***	-0.05	*	-0.01	
LV	-0.07	**	-0.06	**	-0.04		0.01	
MT	-0.07	*	-0.07	*	-0.08	**	-0.06	
NL	-0.03	*	-0.03	*	-0.01		-0.01	
NO	-0.09	***	-0.09	***	-0.07	***	-0.04	*
PL	-0.12	***	-0.12	***	-0.10	***	-0.05	
PT	-0.10	***	-0.09	***	-0.04		-0.04	*
RO	0.05		0.02		0.13		0.16	**
SE	-0.06	**	-0.06	**	-0.03		-0.02	
SI	-0.01		-0.01		0.00		0.01	
SK	0.01		0.01		0.03		0.03	
UK	-0.09	***	-0.09	***	-0.08	***	-0.03	

Notes : (\*)  $p < 0.1$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , and \*\*\*  $p < 0.001$ . Working parents are at active age (18-64) with at least one child below 3 years. Model 1 has no control variables, model 2 controls for individual work-intensity, model 3 controls for household work-intensity, and Model 4 controls for sex, age, education, informal care use, individual earnings, individual work-intensity, and household work-intensity.

Source: EU-SILC 2012, own calculations.

The results reported in Table 1 suggest that in the majority of European countries the poverty risk of working parents with young children is significantly lower if they use formal childcare. The gap is particularly large in France (-12 p.p.), Poland (-12 p.p.), Cyprus (-11 p.p.), Spain (-11 p.p.), Luxemburg (-11 p.p.), Switzerland (-10 p.p.), and Portugal (-10 p.p.). Still, no significant difference can be discerned in Austria, Czech Republic, Denmark, Estonia, Croatia, Hungary, Iceland, Lithuania, Romania, Slovenia, and Slovak Republic. Controlling for individual work-intensity in Models 2 results does not change the AME of formal childcare use on the risk of poverty, not even when taking only women into account (results not shown). In contrast, controlling for work intensity at the household level in Model 3 does substantially reduce the strength of the relationship between formal childcare use and the poverty risk of parents in many countries. These micro-level associations suggest that in most countries, work intensity of the household mediates the link between childcare use and IWP. Insofar childcare services support high levels of household work intensity, it helps keeping in-work poverty at bay. Adding controls for education, informal care use, and earnings does reduce the AME for many countries even more. In separate analyses not shown, we find that individual earnings is the main driver driving down the AME in model 4. In countries like Spain, United Kingdom, and Finland, the effect of formal care use on IWP is not only explained by higher levels of work intensity, but also by the fact that the jobs being performed are better paid.

So, while the relationship between IWP and formal childcare is weak at the macro level (both cross-sectional and over time), we do find at the micro level that using formal childcare services for (working) parents is associated with a lower risk of being poor in the majority of European countries. For most of these countries, this is (at least partly) explained by the fact that formal childcare allows for multiple earners, hence confirming the intuitive causal mechanism that the effect of formal care mainly runs through higher levels of household work intensity.

Still, it should be noted that in a diverse set of countries there is no discernible relationship at the micro level at all. This is the case in Austria, Czech Republic, Denmark, Estonia, Iceland, Lithuania, Slovenia, and Slovak Republic. In Romania, using formal childcare is even related to a higher risk being working poor. Therefore, one should be cautious in generalizing the link between formal childcare use and IWP, since it seems to be country-specific.

### **4.3 Untangling the role of informal care**

In section §2 we discussed that the *type* of care arrangement would not matter from an IWP perspective: in principle both formal and informal types of care arrangements allow mothers to engage in paid work. That is, however, not what we observe in the data. Column 2 of Table 2 shows macro-level correlations between IWP rates on the one hand, and formal

care use, informal care use, and total care use on the other. The data show that the level of informal care use in a country is significantly related to IWP (and this correlation holds under different specifications: see appendix 1), while the sign reverses for the level of formal care use (see also figure 1). In other words, it *does* matter what type of care arrangements is most prevalent at the country level. In contrast with the findings for formal childcare use, IWP is higher in countries where informal care use is more prevalent. Formal and informal care arrangements are not simply interchangeable from an IWP point of view.

A possible reason for this could be that informal care arrangements generally do not support high levels of household work intensity.

This explanation is corroborated by the results presented in columns 3 and 4 of Table 2. We observe that formal childcare use is strongly associated with a higher level of work intensity amongst parents, while informal care is not related to household work intensity at all. Again the results hold under different specifications (see appendix 2). This indeed suggests that a strong reliance on informal care is not compatible with attaining full-time, stable jobs. Moreover, the correlation between informal childcare use and the average household work intensity of all adults of active age (parents as well as adults without children) is negative ( $r = -0.31$ ; this correlation holds for different specifications). This means that in countries where people are more likely to rely on informal childcare, the average household work intensity is lower.

One explanation could be that in these countries the lack of formal childcare availability signals lower degrees of support for women's employment in general and maternal employment in particular.

Table 15.2 *Correlation coefficients, workers with young children, EU countries, 2012*

Childcare use	IWP	Individual WI parents	Household WI parents
Formal childcare	- 0.110	0.636 ***	0.637 ***
Informal childcare	0.441 *	0.022	0.026
Total care (formal or informal)	0.223	0.688 ***	0.690 ***

Note: parents are active aged (18-64) and have a youngest child aged < 3; all workers are of active age (18-64).

Source: own calculations on EU-SILC 2012. Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ , and \*\*\*  $p < 0.001$ .

Lastly, in the literature overview, we discussed that the causal impact of increasing the coverage of formal childcare services on maternal employment was heterogeneous, with often highly-educated women being the main beneficiaries, and that childcare services are generally being used by higher income families. This was also related to the fact that employment opportunities strongly differ between higher and lower educated parents in many countries. Hence the aggregation paradox might appear because the in particular better-off multi-earner families are the ones benefiting from formal childcare services and are having better jobs, as we discussed in section §2. In that case, the relationship between formal childcare use and the risk of in-work poverty among parents could be driven by the fact that families with a low risk of being working poor are also the ones using formal childcare services; not that formal childcare services have a direct impact on the risk of being working poor. Further research should set out to empirically test these hypotheses, untangling the mechanisms modifying the link between the micro and the macro level.

## **5 Conclusion**

This chapter provides a broad perspective on the potential of formal childcare service provision as an effective policy tool for reducing IWP. While it is commonly assumed that public childcare support can help reducing IWP, to date the empirical evidence is scant. Moreover, existing attempts to estimate the impact of formal care on IWP used indirect measures of childcare provision such as government spending. Here we argue that a direct test of the relationship between formal care and the risk of being working poor should focus on the actual use of formal care services by families with young children.

The main reason why using formal childcare services is expected to be related to a lower risk of being working poor, is because of the assumption that childcare services increase maternal labour supply, hence support two-earner families. For that reason, we critically assess the literature regarding the employment effects of childcare costs and availability. The evidence is not as straightforward as it is often assumed: natural experiments tend to show only a modest impact of increases in childcare availability of maternal labour supply, while the impact is sometimes restricted to a particular group of higher skilled mothers.

In the empirical section, we examine the empirical association between formal childcare and IWP both at the micro and the macro level, and subsequently establish links with the mechanisms potentially mediating this relationship. The results show that using formal childcare at the individual level is related to a reduced risk of being working poor.

In many countries, this can be explained by the fact that these families are also families with higher levels of work intensity. At the country level, however, no such relationship can be discerned.

Such aggregation paradox might be explained by confounding mechanisms preventing a household-level relationship to be realized at the country level. Given the fact that childcare use is socially stratified, with higher educated families benefiting more, and since the relationship between childcare use and employment is reciprocal, the result suggest that providing formal childcare is only an effective policy instrument to combat IWP insofar it succeeds in reaching those workers with young children having lower levels of household work intensity and less stable jobs associated with lower earnings.

From an in-work poverty point of view, it should not matter whether families rely on formal or informal care channels, as long as both allow to support high levels of work intensity. We find, however, that informal and formal childcare arrangements are not interchangeable: informal care use is associated with lower levels of work intensity. Childcare provided by relatives and friends does not seem to offer the stability necessary to sustain a two-earner family.

To conclude, the results suggest that providing formal childcare should be an indispensable part of the policy toolkit to combat in-work poverty, yet its success or failure hinges on the two confounding factors identified in this chapter: Which families benefit from childcare services, and what level of work intensity do these services allow?

## NOTES

FTE = the proportion of adults living in a family where care is used for at least one child \* average number of hours per week (as a percentage of 30hours/week)). If a family consists of two or more children younger than 3, we take the average intensity of those children.

We calculated the work-intensity using the 18-64 age brackets, instead of the common practice of looking at individuals in the 18-59 age group

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## APPENDIX

Table 15.A1 *Correlation coefficients in-work poverty and childcare use, 18-64 years, EU-countries, 2012*

	IWP parents		IWP All adults (18-64)	
<b>Incidence care use</b>				
Formal care use	-0.102		-0.253	
Informal care use	0.426	*	0.456	**
Total care use	0.212		0.181	
<b>Formal care among workers</b>				
Formal care among workers	-0.110		-0.234	
Informal care among workers	0.441	*	0.469	**
Total care among workers	0.223		0.241	
<b>Full-time equivalent care use</b>				
Formal care use	-0.153		-0.239	
Informal care use	0.442	(*)	0.665	***
Total care use	0.117		0.192	
<b>Formal care among workers</b>				
Formal care among workers	-0.161		-0.222	
Informal care among workers	0.444	(*)	0.658	***
Total care among workers	0.132		0.243	

Note: t-test with (\*)  $p < 0.1$ , \*  $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\*  $p < 0.001$

Source: EU-SILC 2012, own calculations.

Table 15.A2 *Correlation coefficients childcare use and work-intensity (WI)*

	Individual WI			Household WI		
	All adults	Parents		All adults	Parents	
<b>Incidence</b>						
Formal care total	0.350	(*) 0.636	***	0.328	(*) 0.637	***
Informal care total	-0.248	0.022		-0.259	0.026	
Total care total	0.202	0.688	***	0.172	0.690	***
Formal care among workers	0.297	(*) 0.632	***	0.264	(*) 0.630	***
Informal care among workers	-0.307	0.016		-0.313	0.025	
Total care among workers	0.096	0.679	***	0.059	0.682	***
<b>Full-time equivalent</b>						
Formal care total	0.374	* 0.647	***	0.386	* 0.661	***
Informal care total	-0.377	* 0.098		-0.351	(*) 0.122	
Total care total	0.170	0.746	***	0.189	0.770	***
Formal care among workers	0.328	(*) 0.646	***	0.331	(*) 0.656	***
Informal care among workers	-0.422	* 0.082		-0.395	* 0.110	
Total care among workers	0.070	0.722	***	0.083	0.746	***

Note: t-test with (\*)  $p < 0.1$ , \*  $p < 0.05$ , \*\* $p < 0.01$ , and \*\*\*  $p < 0.001$

Source: EU-SILC 2012, own calculations