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Understanding participation in early childhood education and care: rights, policies and socio-economic conditions

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Summary

This paper draws on the literature on familialism and uses the power resource framework of Vandenbroucke et al. (2021) to empirically estimate the factors affecting early childhood education and care (ECEC) attendance. It finds that entitlement to ECEC positively affects attendance, whereas the effects of parents' leave – maternity in particular – are complex and mixed. Against expectations, government expenditure on childcare is not a robust predictor of higher attendance. Finally, the paper investigates the role played by the socio-economic conditions of the household to which a child belongs and finds that a disadvantaged background works as a penalty on attendance. The results have important policy implications that point to the need for a comprehensive policy approach to achieving higher ECEC attendance.

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Deliverable 3.5 - Understanding participation in early childhood education and care: rights, policies and socio-economic conditions

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Work package	EuSocialCit is an interdisciplinary research project aiming to support the European Union in strengthening social rights and European social citizenship. It evaluates the current state of social rights in Europe and their relationship to social inequalities, gender inequalities, poverty and precariousness, and diagnoses the shortcomings of current policies and institutions at the level of individual Member States and the EU. The EuSocialCit project focuses on three domains in which social rights are important: the empowerment of citizens (e.g. education and activation), fair working conditions and social inclusion. Each of these domains are studied respectively as part of WP3, WP4 and WP5. This report is produced as part of WP3, entitled *Empowerment through social investment*. WP3 focuses on social rights associated with the aspiration of empowerment: rights that enable citizens not only to fully share in the social heritage, but also to further develop this heritage (Marshall, 1950). Hence, WP3 examines policies that are commonly captured by the notion of social investment.
Web address	For more information about the EuSocialCit project, please visit www.eusocialcit.eu. EuSocialCit's output can also be found in its community on Zenodo: https://zenodo.org/communities/eusocialcit.

Table of contents

EuSocialCit
European Social Citizenship

1 Introduction

In 2002, the European Council set the so-called Barcelona targets[1], establishing that EU Member States should: i) remove disincentives to female labour force participation; and ii) strive, by 2010, to provide childcare to at least 33% of children below three years of age, and to 90% of children between three and the mandatory school age. In 2009, a specific early childhood education and care (ECEC) benchmark was adopted under the Education and Training 2020 strategic framework[2], with the recommendation that at least 95% of children between the age of four and the age for compulsory primary education participate in ECEC. This goal was set 'with a view to increasing participation in high-quality early childhood education as a foundation for later educational success, especially in the case of those from disadvantaged backgrounds'. Looking at the EU average, both sets of targets were almost reached by 2016, albeit with some significant variations across Member States. More recently, the European Commission has proposed to revise[3] the Barcelona targets to create new momentum, to foster the further upwards convergence of countries and address issues such as affordability, accessibility and quality of ECEC. The Commission invites Member States to consider the time-intensity of children's participation in ECEC, and the share of children at risk of poverty or social exclusion (AROPE) who participate in ECEC.

The reason behind the increased emphasis on ECEC policies is that the first two years of a child's life can be key in shaping both their development and their parents' (especially the mother's) reintegration into the labour market. First, the availability of ECEC can help mothers with very young children return to work and achieve a better work-life balance (OECD, 2017). Second, existing research suggests that ECEC can improve children's cognitive outcomes (OECD, 2017; Barnett and Belfield, 2006; Esping-Andersen et al., 2012). The literature on early linguistic experiences shows how both quantity and quality of input from caregivers shape children's language development, and help develop children minds (Allen and Kelly, 2015). ECEC can play a crucial role in providing the foundation for both cognitive and socio-emotional skills.

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[1] https://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/71025.pdf

[2] On 12 May 2009, the Council conclusions on a strategic framework for European cooperation in education and training were approved for the period 2010 to 2020, in line with the priorities defined in the Europe 2020 strategy. It contains a number of benchmark and strategic objectives for 2020.

[3] The revision was first announced in the 2020-2025 Gender Equality Strategy, the EU Strategy on the Rights of the Child and the European Pillar of Social Rights (EPSR) Action Plan. It was tabled alongside the European Commission's European Care Strategy on 7 September 2022.

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Based on an extensive literature review, the European Commission (2022) highlights that children from disadvantaged backgrounds may gain more than others from ECEC. Among children from economically disadvantaged homes, those who attend ECEC record positive long-term effects on academic, attitudinal and social skills and, thus, better outcomes in comparison with those who do not take part in ECEC. This is consistent with the evidence that high-quality childcare can compensate for the lack of the richer cultural and educational environment provided to young children in middle-class homes (Elango et al., 2015; Esping-Andersen, 2002; Esping-Andersen et al., 2012). For these reasons, by enriching the home learning environment for children in socio-economically disadvantaged households, ECEC participation can help reduce inequality (OECD, 2018). Therefore, policies aiming to support ECEC attendance of socio-economically disadvantaged children could contribute to social inclusion and reduce the risk of exclusion of vulnerable groups.

Despite the growing policy and academic interest, only limited empirical research has been undertaken on whether ECEC policies determine actual ECEC attendance once the socio-economic conditions of the households to which children belong have been taken into account. One of the main reasons for it is the data limitation at the micro level, hence most research focused on aggregate data. Among them, van Lancker and Ghysels (2016) use a macro-level analysis to explore welfare state characteristics that are associated with inequality in childcare use in European and Organisation for Economic Co-operation and Development (OECD) countries. They find that government involvement in the availability, affordability and quality of service provision is related to lower levels of inequality in childcare use. van Lancker (2017) also follows a macro-level approach and provides evidence that higher income families use childcare services to a much larger extent than lower income families and that more spending at government level leads to higher levels of childcare use, but not directly to lower levels of inequality.

Ünver et al. (2021) are among the exceptions to conduct micro-level analysis. They use EU-SILC data to investigate the determinants of (the intensity of) ECEC attendance and explore the role played by low-income status and migration background. They have two sets of findings. First hourly ECEC participation is higher in countries where the legal entitlement to ECEC and free ECEC provision start early, the ECEC system is unitary, the structural quality standards are high, and public spending per child is high, and the parental fees are low. Second, high public spending and low parental or private financing for ECEC do not correlate with higher use by disadvantaged children. This is line with van Lancker (2017) and point to the risk of a Matthew effect.

The main purpose of this paper is to contribute to this stream of literature, by focussing on the impact of ECEC policy measures and how the impact differs across social groups. The underlying idea is that the ECEC participation rate is an outcome affected by policies inputs, namely the existence of social

rights like entitlement to childcare, as well as of social investment (expenditure), but that the socio-economic status of the parents matters. In a similar line of thinking of Ünver et al. (2021), we use micro-level data to intersect information on ECEC participation with socio economic conditions, but then the analysis is conducted at macro level. Following the EUSOCIALCIT framework, as described in Vandenbroucke et al. (2021), we are interested in how country-level inputs (e.g., rights) and outputs (e.g., expenditure) affect country-level outcomes (e.g., participation rate). We thus use EU-SILC micro-data to compute ECEC participation in EU member states and the AROPE (at risk of poverty or social exclusion) indicator to differentiate by socio-economic group. The AROPE indicator is chosen for two reasons (Flisi and Blasko, 2019 and Flisi et al., 2022). First, it is a well-established living condition indicator of the EU2020 strategy that is easier to grasp than others and thus more suitable for a policy-relevant indicator Second, and most important, it is a more precisely defined concept than just income to capture situations of disadvantage), for instance by including also material deprivation and thus accounting for 'absolute poverty' too.

Against this background, the rest of the paper is structured as follows. Section 2 reviews different streams of literature investigating the rationale behind ECEC policies and provides an analytical framework for the empirical analysis. The review also serves to select sensible and measurable policy factors that can affect ECEC participation rates. Section 3 describes the methodology for the empirical analysis and the data. While the econometric model is estimated at macro level, EU-SILC survey data are used to measure ECEC participation and capture the socio-economic background of children. Section 4 illustrates the econometric model for the analysis. Section 5 presents the results of the analysis and examines the main findings. Section 6 concludes and draws policy implications.

2 Familialism and resource-based approach to ECEC policies

ECEC policy evolution at EU and national level is also reflected in academic work. Comparative childcare literature has expanded broadly since the 1990s, when childcare policies started undergoing two major changes. First, work-family reconciliation, especially for women, and child-centred investment were recognised as important policy ambitions. Second, the legal landscape, notably at EU level, started to change towards non-discrimination and equal rights (Oliver and Mätzke, 2014).

In the literature, this translated into an attempt to classify early childhood targeted social investment policies following a distinct and more specific approach than the one suggested by traditional welfare regimes. The work of Korpi (2000), Leitner (2003) and Saraceno (2016) led to the conceptualisation of 'varieties of familialism'. The focus of this research is on whether public policy support, in the form of income transfers and/or time allocation, is offered to families (and women) to assume their child-care responsibility, and whether it is actively enforced by laws. On the one hand, defamilialising policies aim to partially liberate families (especially women) from caring work. Familialist policies, on the other hand, aim to support families (women, men, or both) in providing childcare, by offering them the time and money to do it (Leitner, 2003; Saraceno, 1997).

Based on the familialisation–defamilialisation dichotomy, different types of strategies can be identified. Leitner identifies four: i) optional familialism; ii) explicit familialism; iii) defamilialism; and iv) implicit familialism. Optional familialism strengthens the family in caring for children through income support measures and parental leave, but also gives the option to be (partly) unburdened from care responsibility through childcare services (crèches and kindergartens). Explicit familialism tends to strengthen the role of families in caring for children through income support measures, but lacks the provision of alternative options to unburden families from their care responsibility (Szelewa, 2016; Saraceno, 2016). The implicit familialism strategy offers no income support to families (e.g., paid leave or any family benefit), nor options to limit the care function of the family. Finally, the defamilialisation strategy is characterised by a strategy to unburden the family from childcare through direct public intervention, or by encouraging recourse to market provision of care services[4].

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[4] A further distinction in family and childcare policies was introduced by Saxonberg (2013), who distinguishes between genderising and degenderising measures. Genderising policies aim to 'promote different gender roles for men and women', whereas 'degenderising policies promote the elimination of gender roles'. As stressed by Kurowska (2018), the (de)genderisation perspective intersects with, but is not necessarily tantamount to, (de)familialisation. Both familialisation and defamilialisation policies can be genderised or degenderised.

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While the familialism literature provides a useful analytical framework to compare the variety of strategies in the domain of childcare policies, its focus is mostly on policy designs and the extent to which they are associated with different degrees of female labour market participation. The link between different strategies and other social outcomes, such as ECEC participation, has remained unexplored in this literature.

The link between policy strategies, defined as input and output, and their outcomes is central to the power resources framework, as defined in Vandenbroucke et al. (2021). The key idea of this approach is that social citizenship can be seen as a process of social-rights realisation rooted in power resources (normative, instrumental resources and enforcement) available to citizens. These resources, which materialise as individual or institutional provisions (at local, national or higher level), give individuals the capacity to claim and receive social rights, manifested in policy outputs and ultimately in outcomes. Applying this framework to ECEC policies, along with the familialism literature insights, one should expect power resources available to children and parents (which materialise as monetary benefits, access to ECEC services and right to leave for parents) to give families the possibility to balance their care responsibilities, ultimately leading to positive outcomes for future adults, and in terms of parents' labour market outcomes.[5] Yet, following the literature presented above, the outcomes associated with these policy input and output, is likely to be affected by the socio-economic conditions of children (and their households).

With this framework in mind, the paper tests to what extent ECEC policies, as measured by public expenditure (policy outputs) and social rights (policy inputs), as well the socio-economic conditions of children's households, affect ECEC attendance. From the outcome perspective, the focus is deliberately on ECEC attendance only. As explained above, an extensive literature already exists on female market participation, which is the traditional outcome measure in familialism literature. Here it is only considered as a control factor (in the form of occupational status of the mother). Furthermore, unlike Ünver et al (2021), we focus on attendance rates (and not hours in ECEC) because of the specific interest in leave policies (leaves take up is not available at micro level).

To capture the role played by social rights, the focus is on two variables, namely the existence of an entitlement for children to participate in ECEC, and the right of parents to take leave (maternal, paternal and parental, paid and non-paid). The choice of parents' leave is driven by the familialism literature, and has the purpose of testing for whether parents' leave is a tool to unburden the family associated with ECEC attendance.

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[5] In this paper, the paper power resources considered are essentially normative. For a full overview of power resources in the context of ECEC see Weshoff et al. (2022) and Alcidi and Corti (2022)

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One can reasonably expect that the existence of entitlement to childcare leads to higher ECEC participation rates, and that a similar conclusion holds for parents' leave (i.e., maternity, paternity and parental[6]). Fathers – and even more so mothers – who work and are entitled to benefit from the leave are expected to resort to ECEC facilities and services. However, the reality is more nuanced and complex than it appears at first sight. The extensive literature on this topic[7], which often has contradictory findings, agrees that the fundamental rationale of offering maternity leave is to protect women in the workforce and to foster the development of their children. In line with this idea, almost all EU countries mandate statutory maternity leave for childbirth and pregnancy. However, in several countries maternity leave goes well beyond the first months after birth. These are usually countries where familialism (and genderisation) is more pronounced. It should be noted that excessive length of maternity leave could lead to unsought effects. In a recent study, Bičáková and Kalísková (2022) estimate the impact of an extension of paid family leave from three to four years, approved in the Czech Republic in 1995, on long-term outcomes for children. They find that 30% of eligible mothers of three-year-old children stay at home rather than enrolling their children into public kindergartens, and that the extended maternal care has a substantial negative impact on their long-term education, especially for children of mothers with lower levels of human capital, as well as on the labour-market outcomes of mothers.

With this background in mind, the expected effect of maternity leave on ECEC participation needs to be qualified. First, maternity leave at birth should not affect the ECEC attendance rate, as attendance under formal arrangements typically starts around four months after birth. Second, longer periods of maternity leave, especially if designed to offer flexibility, should work as an incentive for mothers to return to the labour market while having the possibility to use ECEC facilities to take care of young children. Hence, this should lead to a positive impact on ECEC participation. Third, an overly long period of leave is likely to result in incentives (if the leave is paid or if the ECEC is not free of charge) for women to stay out of the labour market for longer and possibly never to return. The incentives are likely to be higher for women with low-paid jobs, as welfare support, through paid leave, can crowd out labour income. Hence, maternity leave that is too long could be associated with lower ECEC participation, in particular in the case of mothers from disadvantaged backgrounds.

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[6] In 2019, the European Council and European Parliament enacted a Work-Life Balance Directive (PE-CONS 20/19), which aims to provide even more generous parental (hence not only for mothers) leave with a longer duration of leave, higher compensation rates and extended coverage to the other parent.

[7] Among others, Regmi and Wang (2022) offer a comprehensive review of the types of leave policies available across countries, and whether/how they affect women's labour market outcomes, their own and their children's health, and child development.

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3 The data: measuring ECEC inputs, outputs and outcomes

To empirically address the research question defined above, we have designed a two-step approach. First, using EU-SILC micro-level data we compute ECEC participation rates at national level distinguishing by the AROPE status of households and attributing features about parents. As a second step, we collect macro-level data from various sources to identify measures of ECEC policy outputs and input that can be incorporated into the econometric model defined in the next section. The econometric analysis is thus conducted entirely at the macro-level, so to focus on correlations between policy inputs and outputs on one side and country-level outcomes on the other.

3.1 Measuring ECEC participation and socio-economic conditions

Participation rates in ECEC are computed using micro-data from the EU-SILC cross-sectional data. By linking information at individual and household level, it possible to add contextual factors that might explain differences in policy outcomes. In the case of children's participation in ECEC, this means that information about a child can be merged with that of the household to which they belong, such as whether the latter is AROPE, and with the level of education and occupational status of the parents. As mentioned in the introduction, the AROPE indicator captures situations of disadvantage, beyond income, while still providing reliable sample sizes when comparing participation rates among groups, and finding statistically significant differences in ECEC participation (Flisi and Blasko, 2019).

We compute ECEC participation rates for 24 EU Member States for the period 2011 to 2019[8], distinguishing between two children's age groups, namely birth to two years old and three to five years old.[9] Overall, the country-year rates are based on a large number of observations, with total numbers changing depending on the age category selected. For each age category, rates are calculated within each country for the two different socio-economic groups defined by the AROPE status of children's households. Data on parents' characteristics are used to compute population shares within each socio-economic group, e.g. the share of mothers who are working part-time, or the share of fathers who are low-educated.

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[8] The time coverage is defined upon availability of the other country-level variables (see next section). Luxembourg, Malta and Romania are excluded due to data availability constrains (low sample, age definition).

[9] Specific attention is paid to the age group from birth to two years old because, as reported in the Introduction, the first two years can be key in shaping both children development (e.g., cognitive and socio-emotional skills) and parents' reintegration in the labour market. Moreover, public and publicly ECEC provision is more widespread for 3-6 years old compared to 0-2 years old (Eurydice (2014) cited in Ünver et al. (2021)).

The calculation of the ECEC participation rate is based on participation in ECEC under *formal arrangements*, including all kinds of care organised and/or controlled by a public or private structure ensuring certain quality criteria[10]. Rates account for all children reporting at least one hour of childcare under formal arrangements in a typical week, and are computed using children's cross-sectional weight for childcare.[11] Observations reporting more than 60 hours a week in ECEC are 1% at most and treated as outliers, hence excluded from the calculation.[12]

EU-SILC also reports data on other types of arrangement, such as children taken care of by grandparents or friends, or by a childminder at home. As shown in Figure 1, participation in formal or other arrangements can change significantly across countries, and in some countries non-formal arrangements are more widespread than formal ones. In the birth to two years age group, participation in ECEC under formal arrangements lies below the 30% threshold in most countries. This appears to be the case in some southern Member States and most central and eastern European countries (e.g. Cyprus, Czech Republic, Greece, Hungary, Italy and Poland).

Figure 1. ECEC participation rates in 2019 under formal and other arrangements, 0-2 years
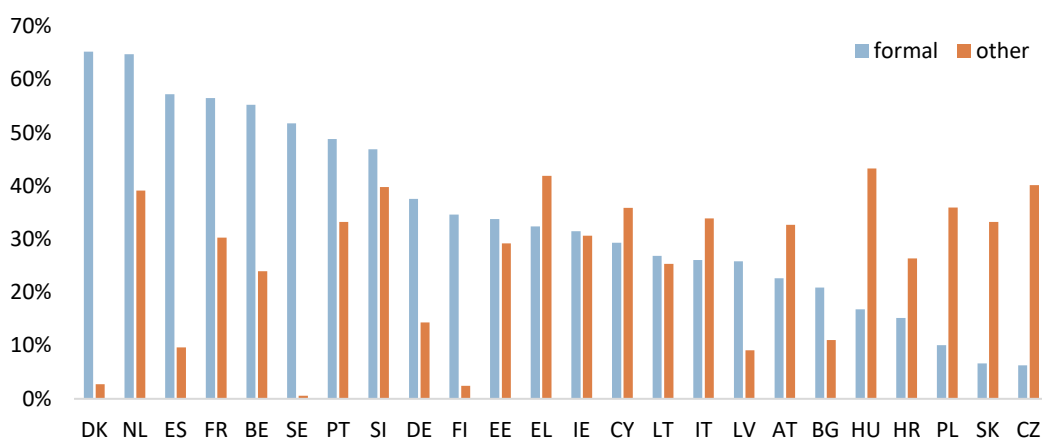
Source: Authors' compilation based on EU-SILC.

This evidence seems to be in line with some findings of the literature on familialism. For instance, Lohmann and Zagel (2016), who attempt to measure familialising and defamilialising policies and to map the range of European countries' family policy constellations (see Figure 2), find that family policies in the southern and eastern EU Member States identified above are characterised (though to different extents) by implicit familialism, which tends to foster children's dependence on their parents' care. In these countries, low ECEC participation rates is in line with expectations. By contrast,

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[10] *Formal arrangements* under EU-SILC include pre-school or equivalent (RL010), compulsory education (RL020), childcare at centre-based services (RL030) and childcare at day care centres (RL040).

[11] Variable RL070 in the Person Registry file of EU-SILC. The ad-hoc weights adjust for the distribution of children for each year of age and ensure a correct distribution of children by age (Flisi and Blasko, 2019).

[12] See Annex for more details on the distribution of observations.

most Nordic countries (Denmark, Sweden and Finland) and also France, Belgium and the Netherlands report high participation in ECEC under formal arrangements. This evidence seems consistent with the finding of Lohmann and Zagel that most of these countries are characterised by defamilialisation policy strategies that aim to reduce dependencies among family members.

Figure 2. Familialisation and defamilialisation across countries in 2004, composite indices
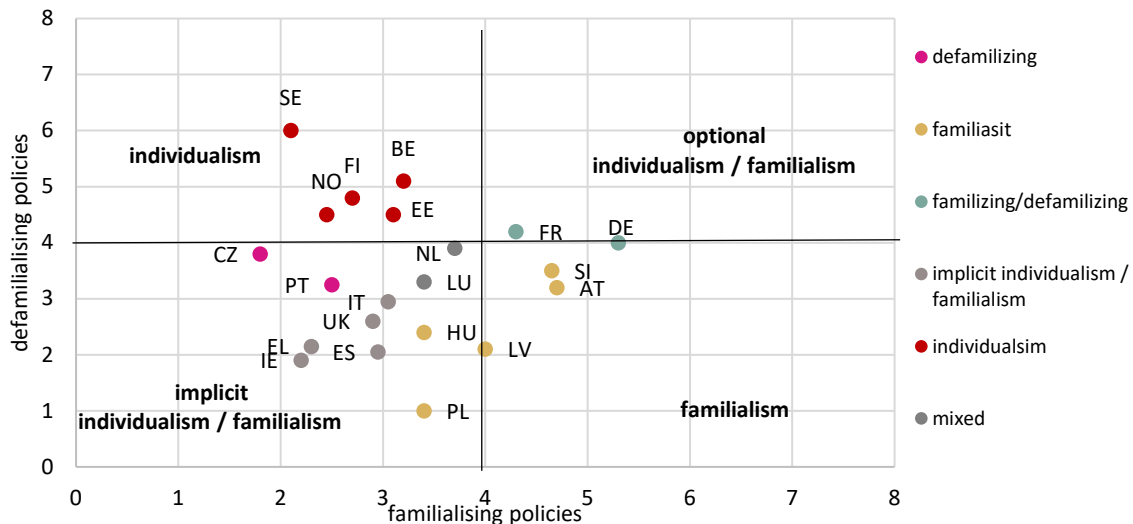
Source: Lohmann and Zagel (2016), p. 61.

When looking at the age category three to five years old (Figure 3), participation in ECEC under formal arrangements grows considerably and most countries reporting around 80%. This significant difference makes it necessary to conduct a separate analysis for the two groups. The difference in participation rates is largely explained by the evolution in children's needs and degree of autonomy, but also by the fact that in most EU Member States pre-primary education starts at the age of three, and access to it is granted as a right to the child in most EU countries.[13] In addition, the extent of the provision of related public services is much higher than the services offered for childcare up to three years old.

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[13] See Weshoff et al. (2022) for an overview of ECEC in EU selected countries.

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Figure 3. ECEC participation rates in 2019 under both formal and other arrangements, 3-5 years
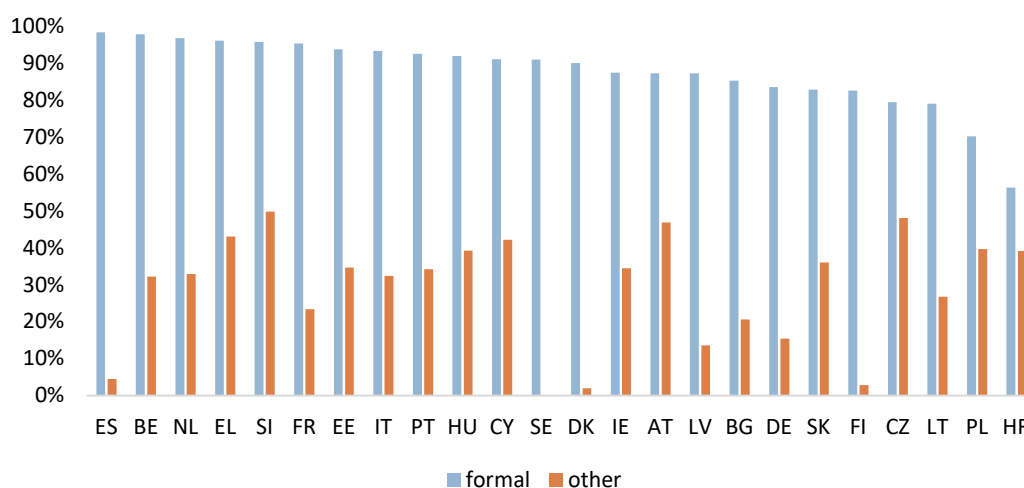
Source: Authors' compilation based on EU-SILC.

Based on the charts above, our focus on formal education arrangements implies that the population of children below the age of three is less representative than the one above three. This is an important limitation for the inference process.

3.2 Measures of normative resources (policy input) and policy outputs

In our analysis, institutional variables, in a broad sense, represent an essential element that can affect ECEC participation. Following Vandenbroucke et al. (2021), we distinguish between inputs and policy outputs. As a first policy input, we consider whether children are entitled to ECEC, i.e., whether they have a formal right to participate in ECEC[14], and we control for the starting age of this right. This information is retrieved from the International Network on Leave Policies and Research (LP&R). The second input is the right of parents, and individually of mothers and fathers, to take leave associated with the birth of a child, the length of the leave, and differentiating between total and paid leave. The International Network on LP&R produces annual reviews of leave policies covering, among others, maternity, paternity, and parental leave, and provides cross-country comparisons. The reports list types of entitlement (e.g., statutory or not), length of leave and how much is paid, as well as additional information such as degree of flexibility (e.g. whether leave can be taken in one block of time or in several blocks). Information on length of leave, the main dimension of interest, is available from 2011 for most EU Member States. Finally, as policy outputs, we consider indicators of aggregate government expenditure on child day care and family policy. Data are retrieved from the Eurostat

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[14] Because of data availability, we cannot control for accessibility (whether the service is free, subsidised or neither of the two), or for the quality of the ECEC service.

ESPROSS dataset on social protection expenditure under the family/children function, and are expressed as a percentage of gross domestic product (GDP).

After merging the different sources of data and ensuring consistency, the final dataset for the analysis covers the period 2011 to 2019 for 24 EU Member States. Participation rates are calculated for each country-year pair for the two groups defined by the household's AROPE status, with information on parents' characteristics used to calculate population shares within each socio-economic group. Policy inputs and outputs are at country-year pair and thus constant across AROPE status.

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4 The model

Based on the theoretical framework defined by the familialism and resource-based approach described above, we empirically investigate the relationship between ECEC participation rates (seen as an outcome) and a set of policy inputs and outputs, after controlling for socio-economic background. We estimate the model defined in the equation below:

$$Rate_{its} = \beta_0 + \beta_1 Soc.Ec.Group_{its} + \beta_2 Parents'ch._{its} + \beta_3 Policy_{it} + \theta_i + \delta_t + \varepsilon_{its}$$

where *i* stands for country, *t* for year and *s* for socio-economic group, with θ_i and δ_t being country and year fixed effects, respectively.

As the analysis started from a micro-level dataset with different dimensions (EU-SILC), the final dataset has multiple levels for each country-year pair, one for each *socio-economic group* analysed. In the analysis, the AROPE status of the household is a dummy variable taking value 1 for children in AROPE and 0 for the others. Since the AROPE status can depend on the labour market status of parents (as low work intensity is a component of AROPE), the inclusion of the variable could potentially lead to endogeneity between ECEC attendance and parental labour market choices. To exclude endogeneity, the model intentionally focuses on macro-level dynamics and uses socio-economic group as a control dimension, rather than a determinant of ECEC participation.

The vector *parents' characteristics* includes another set of control variables, namely the share of low educated and part-time employed for both mothers and fathers within each socio-economic group, as indicated by the three-level notation *its*.

The variables in the *policy* vector, instead, are defined at the country-year pair, and thus are constant across *socio-economic groups*. These variables capture both policy outputs (e.g., expenditure on child day care and on overall family/children social protection) and inputs, namely the length of maternity, paternity or parental leave (testing also on paid weeks only in further specifications), as well as entitlement to ECEC, controlling for the starting age. The latter are the main variables of interest to measure the effects of family policies on participation in ECEC.

Given the structure of the data, the analysis uses a mixed-effects model with both random (socio-economic group) and fixed (country and year) effects, to account for both within-group and between-group variation. Mixed models are well suited when dealing with a hierarchical structure (e.g., socio-economic group within a country), which does not ensure independence in the data. While the mixed-effect estimation is the preferred one for the structure of the data, including both types of effects can

be an excessively robust estimations strategy; hence, some of the robustness checks are carried out using less restrictive conditions.

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5 Results

The model described above is first estimated for the birth to two years age group, and then for three-to five-year-olds. As described above, for each group, participation rates in ECEC are measured for formal care arrangements (which can ensure quality of childcare), and by AROPE status to control for differences among socio-economic groups.

5.1 ECEC participation from birth to two years

Across the different specifications of the model tested, the coefficient of the AROPE variable is always statistically significant at 1% (Table 1). The coefficient ranges between -0.075 in the baseline specification (column 1) and -0.093 in the most extensive specification (column 6). Results point to a statistically significant gap in overall participation in ECEC, with AROPE status representing a penalty of between 7.5 and 9.3 percentage points on attendance rates. The results are in line with Flisi and Blasko (2019), who find significant differences in participation to ECEC in many EU Member States for children from socially disadvantaged groups.

Table 1. ECEC participation by AROPE status, 0-2 years

VARIABLES	(1) Baseline	(2) Maternity	(3) Paternity	(4) Parental	(5) All leave	(6) All leave and ECEC ent. (2 years)
AROPE	-0.0755***	-0.0878***	-0.0866***	-0.0844***	-0.0906***	-0.0929***
	(0.0124)	(0.0137)	(0.0137)	(0.0131)	(0.0139)	(0.0141)
% mothers primary or less edu.	0.0113	0.136	0.0759	-0.0218	0.145	0.153
	(0.109)	(0.102)	(0.105)	(0.115)	(0.102)	(0.100)
% mothers in part-time emp.	0.250***	0.228***	0.238***	0.204***	0.214***	0.186***
	(0.0666)	(0.0698)	(0.0715)	(0.0683)	(0.0680)	(0.0697)
% fathers primary or less edu.	-0.229**	-0.313***	-0.258***	-0.193*	-0.306***	-0.316***
	(0.106)	(0.0971)	(0.0990)	(0.107)	(0.0937)	(0.0936)
% fathers in part-time emp.	0.274***	0.299***	0.295***	0.286***	0.311***	0.330***
	(0.0988)	(0.0977)	(0.0959)	(0.104)	(0.0983)	(0.0990)
Maternity leave (weeks)		0.00101**			0.00063	0.00085*
		(0.000460)			(0.000491)	(0.00051)
Paternity leave (weeks)			0.00683*		0.00669*	0.00661*
			(0.00364)		(0.00359)	(0.00362)
Parental leave (weeks)				0.00023***	0.00027***	7.84e-05

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VARIABLES	(1) Baseline	(2) Maternity	(3) Paternity	(4) Parental	(5) All leave	(6) All leave and ECEC ent. (2 years)
				(8.56e-05)	(6.88e-05)	(9.47e-05)
ECEC entitlement (ent.)						0.0887***
						(0.0145)
Child day care (% GDP)	0.127*	0.0342	0.0669	0.134*	0.0425	0.0187
	(0.0758)	(0.0657)	(0.0698)	(0.0774)	(0.0578)	(0.0574)
Constant	0.335***	0.433***	0.325***	0.333***	0.334***	0.350***
	(0.0412)	(0.0496)	(0.0451)	(0.0439)	(0.0445)	(0.0457)
Observations	498	396	406	430	394	394
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.890	0.891	0.890	0.886	0.891	0.891
R2 within	0.284	0.312	0.314	0.296	0.329	0.345
R2 between	0.962	0.957	0.956	0.955	0.956	0.955

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Parents' characteristics as measured by being under a part-time employment arrangement are found to be positively related to participation in ECEC, in the case of both mothers and fathers. In other words, flexible work arrangements appear to be associated with higher rates of attendance[15].

Educational attainment, on the other hand, only seems relevant when referring to fathers. Low education of fathers works as a penalty, in a comparable way to AROPE, on ECEC attendance, and the size is much larger than AROPE. Explanations could have a cultural and economic nature. On the one hand, a household with a low-educated father could be more likely to have a low-educated mother, potentially in charge of caring for young children. On the other hand, the decision to keep young children at home with the mother could be incentivised by higher family allowances, against costs if access to ECEC is not free of charge.

As a further step, the analysis adds the number of weeks of parents' leave, distinguishing between maternity, paternity and parental leave, separately to the baseline specification (columns 2 to 4), and then tests all regressors together (column 5). Among the three types of leave, parental leave is the only one significant at 1% level, and the coefficient is small. The low magnitude might be due to the significant differences in length between parental leave and the other two types of leave. In the EU, parental leave must be at least four months for each parent, as defined under Directive 2010/18/EU,

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[15] It is not shown in this table, but the share of mothers working full time is also found to positively affect ECEC participation rates.

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and could span several years (in some countries up to the age of 12). It should be noted that the directive defines this leave as enabling parents 'to take care of (a) child until a given age', so it cannot be an alternative to statutory maternity leave[16].

Both maternity and paternity leave are found to be significant when added separately, but only paternity leave remains significant across all specifications (columns 5 and 6). In all cases, significance is low, and the coefficient is very small. Overall, the evidence that the length of maternity leave affects ECEC participation is very weak. While the categorisation of the data[17] can play a role, maternity leave concentrated on (and often limited to) the very first months of a child's life and the last week(s) of pregnancy does not affect ECEC attendance by definition. Formal childcare is not common, and most often does not exist at all.

Under further specifications reported in the Annex (Table 4), we test whether considering only the weeks of paid leave, instead of total (paid and unpaid) leave, changes the result. This test is important to disentangle potential incentives for parents to return (fully or partially) to work or not. Results suggest that this is not the case. Coefficients are similar to those with the overall number of weeks of leave (column 5), with the coefficient of paternity leave slightly larger (suggesting that it can make a limited difference) and the coefficient of parental leave slightly lower. The latter may be explained by the fact that parental leave is in most cases unpaid.

In addition to the three types of leave available to parents, entitlement to ECEC for children is added. In the regression, this is a dummy capturing whether entitlement to ECEC exists and embedding the age at which the entitlement is granted. The dummy takes value 1 if a country has entitlement to ECEC starting no later than two years old, and 0 otherwise[18]. Column 6, which reports the results of the specification testing also for the three types of leave together, indicates that, as expected, the existence of entitlement to ECEC for children below the age of two works as a premium (almost 9%) on ECEC attendance. Overall, the output of this last specification is similar to those reported in column 5 for socio-economic variables, but the leave variables appear to be affected. Parental leave is now

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[16] It is important to note that Sweden and Portugal do not have a designated maternity leave, but only a parental leave provision. They provide paid leave that women may or must take at and around childbirth, but it has the generic designation of 'parental leave' and can, in certain circumstances, be taken by the father (Koslowski et al., 2021). Based on this, the weeks assigned for parental leave are first attributed to maternity leave (results in Table 1). Then, robustness checks are conducted to verify that the results are not driven by the two countries. When zero weeks of maternity leave are assigned to Portugal and Sweden, or if both countries are excluded from the analysis, the coefficients are still positive but not statistically significant when maternity leave is included in the regression (i.e. column 2), while they are negative and significant at 10% level when included together with parental and paternity leave (i.e. column 5). Using alternative data from the OECD for Portugal and Sweden leads to a negative coefficient, which is significant (at 10% level) only in the specification including all three types of leave.

[17] Treatment of 'parental leave provision' rather than maternity leave for Portugal and Sweden, as illustrated in footnote 16.

[18] From a statistical perspective, the specification of the age at which the entitlement is granted is not secondary. A simple dummy for the existence of entitlement is not statistically significant.

not significant, whereas maternity leave becomes so. These results seem to reinforce the idea that the relationship between parents' leave and ECEC participation is difficult to grasp, due to the complexity of the leave agreements, the importance of the degree of flexibility that is allowed and the non-linear relationship between the duration of leave and the benefits for the mother[19].

Finally, expenditure on child day care (% of GDP), namely our indicator of monetary policy output, exhibits a positive sign but is significant only under the baseline specification, though not in the most complete specification (column 6). Against initial expectations, government expenditure does not seem to be a key factor affecting ECEC attendance.[20]

5.1.1   Interaction terms

To further investigate how the impact of policy inputs and outputs on participation can differ between socio-economic groups, we test for their interaction with AROPE status. Interactions between AROPE and entitlement to ECEC and AROPE and expenditure in childcare are not significant. We only report results on leaves.[21]

The AROPE coefficients are always negative and statistically significant, whereas for the leaves, only maternity leave is significant (Table 2). Since the specification tests for interaction, these coefficients capture the impact of leave on participation rates for children who are <u>not</u> in AROPE status, thus different from the overall main effect reported in Table 1. The interaction terms, instead, test whether there is a difference between the slopes of leaves for not AROPE and AROPE. Significant results for the interaction terms are found for both maternity and parental leave (the latter coefficient is statistically different from zero but very low)[22]. Overall, the results seem to suggest that an additional week of maternity leave is related to a larger marginal effect for participation rate of AROPE status, with an even larger effect if the leave is paid.[23]

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[19] The idea of non-linearity is that maternity leave at birth is crucial, and that the benefits are likely to increase with length up to a point when overly long leave is damaging for the mother's return to work.

[20] However, when testing for overall family expenditure, not only child care, the results are significant. See Robustness checks.

[21] Only the tested leave (distinguishing whether it is paid or not) enters each specification. When testing with the full specification, interaction terms remain significant if they were, while the simple slope of the leave for not AROPE is not significant for maternity.

[22] As mentioned above, however, Portugal and Sweden do not have designated maternity leave, thus here too we test different specifications. When zero weeks of maternity leave are assigned to Sweden and Portugal, the interaction term is positive but significant only when testing for paid weeks of leave. The coefficient of leave, instead, is negative but not statistically significant. When both Portugal and Sweden are excluded from the regression, the interaction is again positive and significant for both all and paid weeks of leave. The coefficient for leave is again negative and not significant. Finally, using alternative data from the OECD for Portugal and Sweden, interaction terms are positive but not significant, and the leave coefficients are still negative and not significant.

[23] It is worth nothing that, by definition, the analysis considers only working mothers, and hence having the right to paid leave. This is also likely to make the sample relatively small.

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Table 2. Interaction AROPE status and leave, 0-2 years

VARIABLES	Maternity		Paternity		Parental	
	All	Paid	All	Paid	All	Paid
AROPE	-0.112***	-0.123***	-0.0884***	-0.0885***	-0.108***	-0.0992***
	(0.0152)	(0.0190)	(0.0163)	(0.0161)	(0.0171)	(0.0156)
Leave (weeks)	0.00046***	-0.0007	0.0060	0.0063	0.000120	-8.46e-05
	(0.000178)	(0.000508)	(0.00439)	(0.00440)	(0.000106)	(0.000144)
AROPE * leave	0.001***	0.002***	0.002	0.002	0.0002*	0.0002
	(0.000148)	(0.000407)	(0.00331)	(0.00330)	(0.000127)	(0.000172)

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The predictive margins for non AROPE on weeks of maternity leave is much higher than for AROPE (Figure 4), as higher is the enrolment rate. However, the slope for non AROPE is almost flat, suggesting only a minor effect associated with additional weeks.[24] By contrast, the slope is much steeper for AROPE, which points to higher predicting power when the duration of the leave increases, thought this is still low.

Figure 4. Interaction AROPE and maternity leave, predictive margins (95% Cis)
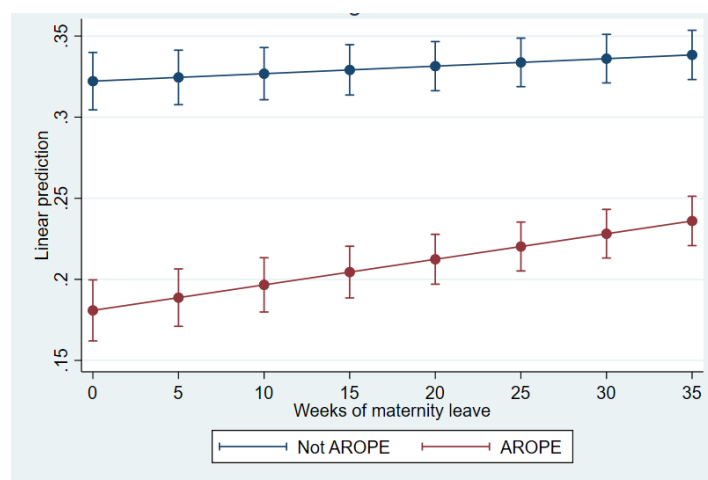
5.2 ECEC participation of from three to five years

For comparison purpose, we also run estimates for three- to five-year-olds, thus capturing the factors affecting participation in pre-primary education. The idea of having two separate groups is to account for different needs driven by different ages and stages in life, but above all for the difference in the

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[24] The statistical significance of the interaction term is shown by the relatively small confidence intervals of both slopes, and the small standard error relative to the absolute value of the coefficient. Based on the standard errors reported Table 2 it accounts for around 13% only.

policies in place. Children's entitlement to pre-primary education is very widespread in the EU, and the supply of public services is much wider than for youngest children. Consistent with this hypothesis, the entitlement variable should not be relevant (almost no variation in the data). This is in fact the case and the variable is statistically not significant[25]. Yet, it may still be the case that ECEC participation rates are related to socio-economic conditions and parents' leave rights.

The results of the regressions shown in Table 3 confirm that ECEC attendance is significantly different between AROPE and non-AROPE status, and even larger coefficients than in the birth to two years age group. It should also be recalled that the coverage is much larger for this group (as participation in pre-primary is much more widespread than attendance in ECEC facilities for children below three) and hence more representative of the relevant total population and EU Member States. A point of difference is that the parents' employment status, i.e. the share of both mothers and fathers in part-time employment, is not significant for this age group, whereas it was significant for children up to two years (Table 1).

Table 3. ECEC participation by AROPE status, 3-5 years

VARIABLES	(1) Baseline	(2) Maternity	(3) Paternity	(4) Parental	(5) All	(6) All - paid
AROPE	-0.109***	-0.124***	-0.124***	-0.116***	-0.124***	-0.126***
	(0.0170)	(0.0166)	(0.0173)	(0.0179)	(0.0169)	(0.0165)
% mothers primary or less edu.	0.0964	0.151*	0.259***	0.205***	0.156*	0.152**
	(0.0980)	(0.0784)	(0.0820)	(0.0598)	(0.0870)	(0.0738)
% mothers in part-time emp.	-0.0576	-0.0927	-0.0947	-0.0900	-0.0796	-0.0945
	(0.0889)	(0.0774)	(0.0824)	(0.0888)	(0.0829)	(0.0781)
% fathers primary or less edu.	-0.150	-0.178*	-0.263**	-0.267***	-0.167	-0.156*
	(0.124)	(0.1000)	(0.110)	(0.0942)	(0.104)	(0.0945)
% fathers in part-time emp.	-0.0136	-0.0284	-0.0790	-0.0753	-0.0440	-0.0301
	(0.117)	(0.142)	(0.120)	(0.110)	(0.134)	(0.135)
Maternity leave (weeks)		1.47e-05			0.000660*	-0.00151***
		(0.000415)			(0.000372)	(0.00054)
Paternity leave (weeks)			0.00373***		0.00307***	0.00303***
			(0.00111)		(0.000997)	(0.00093)
Parental leave (weeks)				-0.00033**	-0.00054***	-0.00031
				(0.000154)	(0.00015)	(0.00026)
Child day care (% GDP)	0.0331	0.0325	0.0259	0.0311	0.0491	0.0628
	(0.0831)	(0.0953)	(0.0926)	(0.0693)	(0.0914)	(0.0900)
Constant	1.024***	1.019***	1.036***	1.079***	1.036***	1.060***
	(0.0410)	(0.0421)	(0.0383)	(0.0434)	(0.0437)	(0.0434)
Obs	488	386	396	420	384	384
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

[25] See

Table 77 in the Annex.

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VARIABLES	(1) Baseline	(2) Maternity	(3) Paternity	(4) Parental	(5) All	(6) All - paid
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.820	0.839	0.845	0.845	0.845	0.843
R2 within	0.147	0.145	0.153	0.188	0.185	0.169
R2 between	0.929	0.942	0.943	0.941	0.941	0.942

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This difference could be explained by different needs linked to both children's development and parents' return to work. Part-time working arrangements might be much more effective during the early years of children's lives when parents need greater flexibility in combining private and professional spheres[26].

Another difference concerns parents' education levels. The share of fathers with primary or lower education is still negatively correlated with participation rates, as above. However, the coefficient of the share of mothers with primary education or lower is now positive, statistically significant and relatively large, hence being associated with a higher participation rate of children in ECEC between three and five years old.

The three types of leave tend to have an even smaller impact on ECEC participation than for the age group birth to two years. However, what is more interesting is the differences in the sign of the relationship. As expected, maternity leave is never significant. Even in the most familialist countries, maternity leave rarely goes up to the age of three. However, it becomes negative and significant when entering the number of paid weeks of each of the three types of leave, replacing total leave (paid and unpaid). This is an important difference when comparing with the birth to two years category. This finding is in line with the evidence from the literature showing that prolonged leave can delay mothers' return to work and encourage their withdrawal from the labour market to favour home-based care, especially in low-income households (Bothfeld and Rouault, 2014). If the aim of social investment is to increase – rather than decrease – the labour supply, schemes should be designed so that (mandatory) leave exists but is not too long, and/or parents may be encouraged to negotiate part-time/flexible work arrangements (Bothfeld and Rouault, 2014).

Consistent with this reasoning, parental leave is also found to be negatively correlated with ECEC participation rates, whereas it was always positive when analysing the birth to two years age group. Parental leave is by far the longest leave available among the three, and it is important to recall that a negative coefficient means that for children above three years old, an additional week of parental

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[26] Interestingly, when the shares of parents working part-time are replaced with the shares of full-time employed, the latter report a positive coefficient significant for fathers but not for mothers.

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leave does not increase the ECEC attendance rate. This of course does not say anything about whether an extra week of parental leave makes family life more balanced.

When it comes to paternity leave, instead the effect is still positive. Among the three types of leave, paternity is usually the shortest, but is often characterised by flexibility in how it can be taken (e.g. several slots). Hence, the positive relationship of paternity leave with ECEC participation rates, also at a later stage, might indicate the importance of this leave in re-balancing care responsibilities between the two earners in the household, as well as having fathers who are more involved in their children's first years of development overall.

Against the complexity of the results, one can safely say that the results of this analysis are in line with the policy research suggesting that wider accessibility (especially for disadvantaged groups) to ECEC, and earlier ECEC entitlement for children (UNICEF, 2019; O'Brien and Moss, 2020) are more important in fostering ECEC attendance than longer leave for parents.

5.3 Robustness checks

In addition to the main results shown above, we conduct a number of robustness checks. General government expenditure on child day care is replaced with total expenditure for the family and children function. Child day care, in fact, represents only one part of total expenditure on social protection for the family, and other types of support, both monetary and in kind, can also be relevant in supporting parents after childbirth and increase overall incentives and possibilities to use ECEC. Overall, results are confirmed for all indicators, except for paternity leave, which is significant only when considering paid weeks (see Table 4 and Table 5 in the Annex). For a government's social expenditure on family and children, the coefficient is always positive and statistically significant, while expenditure on child day care is significant only in the baseline specification.

Additional tests are also carried out using share of tertiary instead of primary educated. As expected, the share of mothers with tertiary education reports a positive and significant coefficient when considering the birth to two years age group (while primary education reported only a positive but not significant coefficient). The coefficient is not significant, however, when considering three- to five-year-olds. Where fathers are concerned, the share of tertiary-educated fathers reports a positive coefficient for children up to two years old and a negative coefficient for three- to five-year-olds, but not significant. Hence, parents' education level seems to have a greater effect on ECEC participation rates in the very first years of children's lives.

Finally, a last robustness check looks into the model specification. While the mixed-effect estimation model is preferred given the multidimensional structure of the data, including both time and country fixed effects might be an overly robust estimation strategy. Since policy variables are defined at the country level, we exclude country fixed effects to allow the model to capture more heterogeneity in the data. Results are very similar to the main specification[27], with statistical significance increasing for maternity and paternity leave (pass from 10% to 5% significance level), whereas expenditure in childcare becomes significant (at 10% level in the specification with all weeks of leave, and 5% level when considering only paid weeks of leave). Entitlement to ECEC (starting at two years of age at the latest) is still significant at 1% level and parental leave remains not significant.

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[27] See Table 6 in the Annex

6 Conclusions and policy considerations

Twenty years after the first definition of the Barcelona targets, the European Commission has proposed its revision to further incentivise the development of ECEC services, particularly with respect to their affordability, accessibility, and quality. ECEC attendance can play a key role in fostering children's development and long-term learning outcomes, as well as in supporting mothers' return to work and pursuit of a better work-life balance. Furthermore, participation in ECEC is found to be important in supporting the development of children from disadvantaged socio-economic groups and reducing inequality in the long term.

Against this background, this paper has investigated empirically how social investment policies in the form of the provision of rights to children and parents, as well as public expenditure, can affect participation in ECEC under formal arrangements, while controlling for socio-economic conditions.

The analytical approach, which draws from the familialism literature and uses the power resources framework, combines micro- and macro-data in order to isolate the participation rates of children belonging to AROPE households, and to test for the effect of social policies defined at country level. While the main interest of the paper is to test how ECEC participation can be affected by policy inputs such as the existence of social rights (e.g., children's entitlement to childcare and parents' entitlement to leave) and the degree of social investment (as expenditure on childcare), the paper adds to the existing literature by controlling for socio-economic characteristics. Last but not least, the analysis differentiates between two age groups – namely from birth to two years, and from three to five years – in order to capture possible differences driven by significant changing conditions that can materialise within households, and with respect to the level of services provided at country level, both to children (entitlement) and parents (length of different types of leave).

Overall, the results point to a significant negative relation between participation in ECEC and socio-economic status, here expressed as AROPE status of households, which confirms findings from the existing literature. When it comes to parents' characteristics, the relationship with employment status seems to differ depending on the age group tested. Flexible work arrangements (part-time) appear to be associated with higher rates of attendance at the very early stages of a child's life, as they could potentially provide parents with greater possibility to combine work with care duties. The educational attainment of parents seems only to be relevant when it refers to fathers, with a lower level of education associated with lower participation in ECEC.

The role of policy inputs, defined as parental leave in broad sense (maternity, paternity and parental), in affecting ECEC attendance is rather complex.

While both parental and paternity leave seem to have a positive effect on participation in ECEC for children up to two years old, evidence that the length of maternity leave affects ECEC participation is very weak. The reason for this is that in the majority of EU countries, maternity leave is statutory and concentrated (and often limited) to the very first months after childbirth and the last week(s) of pregnancy, when formal childcare often does not exist at all. When considering three- to five-year-olds, on the other hand, maternity leave appears to be negatively correlated with participation in ECEC. This finding seems to be in line with evidence from the literature that prolonged leave can delay mothers' return to work and even encourage their withdrawal from the labour market by favouring home-based care, especially in low-income households. Consistent with this explanation, parental leave is also found to be negatively correlated with ECEC participation rates of children aged three to five, whereas it was positive when analysing the rates of children from birth to two years old. Paternity leave, instead, is positively associated with participation in ECEC for the age group three to five years, potentially because it can provide flexibility to families in re-balancing care responsibilities between the two earners in the household.

When it comes to social rights given directly to children, entitlement to ECEC not later than two years of age is found to positively affect the participation of children (from birth to two years old). Lastly, social investment proxied by expenditure on childcare reports a positive coefficient as expected, but the results are not very robust. This might indicate that other types of support under family policies can help parents in balancing their commitments and support children's participation in ECEC.

One aspect, beyond ECEC attendance, that is not investigated in this paper is the quality of the ECEC services and how it intersects with socio-economic conditions of children. While undertaking such an analysis poses major research design challenges, it represent an important contribution to academic literature and to the policy debate.

Notwithstanding these limitations, the findings above lead to two sets of policy considerations.

First, as government expenditure on childcare does not appear to be the key metric that affects ECEC attendance, policy makers should also focus on other aspects. Granting entitlement to ECEC at an early age seems to matter for attendance. On this front, EU Member States have been following different approaches, and many countries have room for improvement. Leave policies and access to ECEC are linked and are key for working parents (especially mothers), but it is difficult to disentangle the way in which they interact. The design of leave policies is complex, and contains many variable factors, e.g. maternity, paternity and parental, statutory, voluntary, different durations, paid and non-

paid. It is impossible to establish simple causality links between the different types of leave (in general) and ECEC participation. Yet, two points seem to emerge. The duration of maternity leave (which remains the key leave from the point of view of social outcomes) seems to affect ECEC attendance in a non-linear way: an overly long maternity leave can result in negative outcomes for mothers (who may exit the labour market) and children (through no ECEC attendance). By contrast, flexible paternity and parental (for both parents) leave over an extended period (beyond two years of age) can favour ECEC attendance. Both aspects should be taken into consideration in the design of distinct types of leave.

Second, the findings of this paper raise the fundamental question of whether, to increase ECEC attendance, policy makers should only focus on early childcare. While the answer to this question requires further research, it seems clear that ECEC policies alone are unlikely to overcome the factors, like the AROPE status, that are associated with low attendance. Moving families out of AROPE status requires policies against poverty but also labour market policies, as parental employment status typically affects the likelihood of the AROPE status of a household.

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Annex 1. Distribution of observations

The figure below provides descriptive evidence on overall participation in ECEC and differences among socio-economic groups, defined here by the AROPE dimension: among all children attending ECEC (i.e. between 1 and 60 hours), about two thirds receive between 20 and 40 hours per week (panel a), whereas children belonging to a household with AROPE status tend to receive fewer hours (in panel b, the frequency is higher for this group up to 30 hours per week).

Figure 5. Distribution of hours in ECEC, 0-2 years
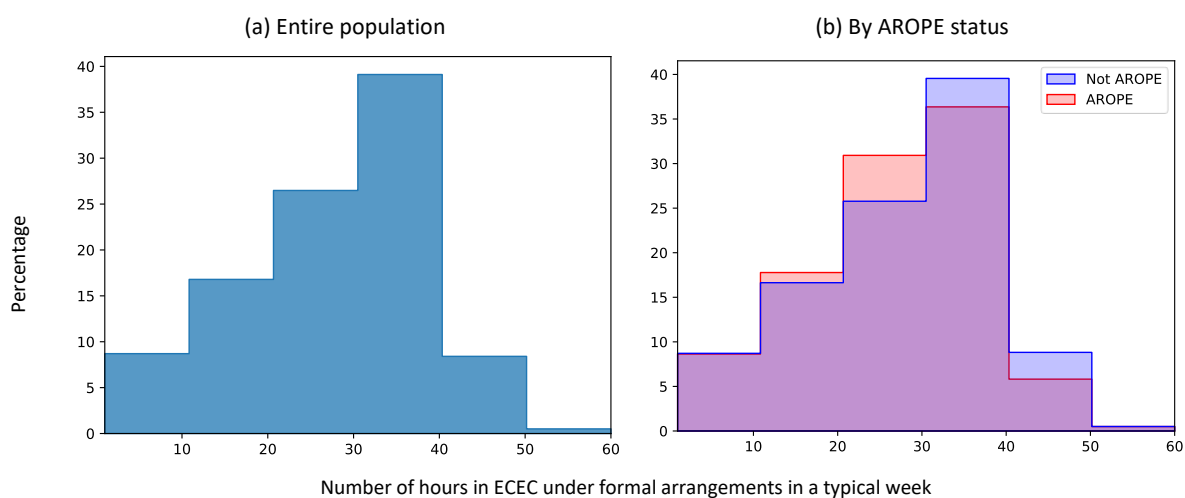
Source: Authors' compilation based on EU-SILC.

Note: Romania and Luxembourg are excluded due to poor quality of data.

Annex 2. Robustness checks

Table 4. All weeks of leave paid, 0-2 years

VARIABLES	(1) All leave - paid
AROPE	-0.0886***
	(0.0141)
% mothers primary or less edu.	0.100
	(0.102)
% mothers in part-time emp.	0.239***
	(0.0710)
% fathers primary or less edu.	-0.265***
	(0.0989)
% fathers in part-time emp.	0.301***
	(0.101)
Maternity leave (weeks)	-0.000167
	(0.000451)
Paternity leave (weeks)	0.00751**
	(0.00369)
Parental leave (weeks)	0.000209**
	(9.83e-05)
Child day care (% GDP)	0.0561
	(0.0651)
Constant	0.340***
	(0.0436)
Obs	394
Country FE	Yes
Year FE	Yes
R2	0.890
R2 within	0.307
R2 between	0.956

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. Results using total government expenditure on social protection for family/children, 0-2 years

VARIABLES	(1) Baseline	(2) Maternity	(3) Paternity	(4) Parental	(5) All	(6) All - paid
AROPE	-0.0740***	-0.0888***	-0.0866***	-0.0847***	-0.0920***	-0.0883***
	(0.0125)	(0.0137)	(0.0136)	(0.0130)	(0.0136)	(0.0141)
% mothers primary or less edu.	0.0419	0.131	0.0833	0.00824	0.139	0.0892
	(0.100)	(0.100)	(0.104)	(0.103)	(0.0992)	(0.102)
% mothers in part-time emp.	0.274***	0.235***	0.252***	0.227***	0.217***	0.251***
	(0.0655)	(0.0665)	(0.0696)	(0.0661)	(0.0634)	(0.0677)
% fathers primary or less edu.	-0.245**	-0.292***	-0.249**	-0.194*	-0.283***	-0.249**
	(0.104)	(0.102)	(0.101)	(0.104)	(0.0996)	(0.104)
% fathers in part-time emp.	0.251**	0.298***	0.289***	0.275**	0.311***	0.299***
	(0.103)	(0.0956)	(0.0945)	(0.108)	(0.0946)	(0.0986)
Maternity leave (weeks)		0.00114**			0.000674	0.000332
		(0.000450)			(0.000476)	(0.000455)
Paternity leave (weeks)			0.00592		0.00576	0.00652*
			(0.00370)		(0.00367)	(0.00376)
Parental leave (weeks)				0.000309***	0.000356***	0.000337***
				(8.64e-05)	(7.50e-05)	(0.000117)
Family/children (% GDP)	0.0283**	0.0366**	0.0280*	0.0450***	0.0405***	0.0383***
	(0.0143)	(0.0169)	(0.0161)	(0.0157)	(0.0122)	(0.0128)
Constant	0.270***	0.345***	0.255***	0.218***	0.236***	0.239***
	(0.0527)	(0.0630)	(0.0637)	(0.0559)	(0.0536)	(0.0533)

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VARIABLES	(1) Baseline	(2) Maternity	(3) Paternity	(4) Parental	(5) All	(6) All - paid
Obs	498	396	406	430	394	394
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
R2	0.890	0.893	0.891	0.888	0.893	0.892
R2 within	0.280	0.332	0.322	0.305	0.352	0.324
R2 between	0.963	0.957	0.956	0.956	0.955	0.956

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6. Results excluding countries fixed effects, 0-2 years

VARIABLES	Main model All leaves	Main model All paid leaves	excl. cou FE All leaves	excl. cou FE All paid leaves
AROPE	-0.0929***	-0.0917***	-0.102***	-0.102***
	(0.0141)	(0.0141)	(0.0376)	(0.0367)
% mothers primary or less edu.	0.153	0.108	0.126	0.0977
	(0.100)	(0.0996)	(0.103)	(0.101)
% mothers in part-time emp.	0.186***	0.199***	0.231***	0.238***
	(0.0697)	(0.0708)	(0.0747)	(0.0751)
% fathers primary or less edu.	-0.316***	-0.276***	-0.188**	-0.152
	(0.0936)	(0.0988)	(0.0936)	(0.0961)
% fathers in part-time emp.	0.330***	0.320***	0.361***	0.348***
	(0.0990)	(0.0993)	(0.102)	(0.0996)
Maternity leave (weeks)	0.000855*	1.42e-05	0.000812**	0.000286
	(0.000507)	(0.000465)	(0.000390)	(0.000438)
Paternity leave (weeks)	0.00661*	0.00740**	0.00663**	0.00689**
	(0.00362)	(0.00376)	(0.00334)	(0.00346)
Parental leave (weeks)	7.84e-05	8.56e-05	-4.01e-05	-0.000152
	(9.47e-05)	(0.000126)	(0.000100)	(0.000138)
ECEC entitlement (ent.)	0.0887***	0.0942***	0.0934***	0.0969***
	(0.0145)	(0.0132)	(0.0245)	(0.0232)
Child day care (% GDP)	0.0187	0.0323	0.0921*	0.103**
	(0.0574)	(0.0565)	(0.0538)	(0.0511)
Constant	0.350***	0.358***	0.166***	0.183***
	(0.0457)	(0.0449)	(0.0324)	(0.0321)
Country FE	Yes	Yes	No	No
Year FE	Yes	Yes	Yes	Yes
Obs	394	394	394	394
R2	0.891	0.890	0.476	0.500
R2 within	0.345	0.330	0.335	0.318
R2 between	0.955	0.955	0.489	0.520

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7. ECEC entitlement, 3, 4 and 5 years old

VARIABLES	(1) ECEC ent. 3 yrs	(2) ECEC ent. 4 yrs	(3) ECEC ent. 5 yrs
AROPE	-0.124***	-0.124***	-0.124***
	(0.0169)	(0.0173)	(0.0169)
% mothers primary or less edu.	0.155*	0.158*	0.156*
	(0.0871)	(0.0862)	(0.0877)
% mothers in part-time emp.	-0.0791	-0.0795	-0.0797
	(0.0826)	(0.0827)	(0.0832)
% fathers primary or less edu.	-0.163	-0.166	-0.167
	(0.105)	(0.107)	(0.105)
% fathers in part-time emp.	-0.0442	-0.0442	-0.0439
	(0.135)	(0.134)	(0.134)
Maternity leave (weeks)	0.000647*	0.000656*	0.000664*
	(0.000359)	(0.000372)	(0.000378)
Paternity leave (weeks)	0.00305***	0.00298***	0.00309***
	(0.000980)	(0.000878)	(0.000987)
Parental leave (weeks)	-0.000504***	-0.000532***	-0.000542***
	(0.000154)	(0.000151)	(0.000155)
ECEC entitlement (ent.)	0.0358*	0.00575	-0.00399
	(0.0210)	(0.0254)	(0.0226)
Child day care (% GDP)	0.0503	0.0494	0.0488
	(0.0908)	(0.0916)	(0.0921)
Constant	0.999***	1.030***	1.040***
	(0.0474)	(0.0493)	(0.0480)
Obs	384	384	384
Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
R2	0.845	0.845	0.845
R2 within	0.188	0.186	0.186
R2 between	0.941	0.941	0.941

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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