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Benefits of Early Childhood Education and Care and the conditions for obtaining them

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Executive Summary (English)

In the European Union, early childhood education and care (ECEC) has been a growing priority in many Member States. Whereas education has long been high on the policy agenda, early childhood education and care has only started to receive attention more recently. This interest in the early years is inspired by a rapidly expanding body of scientific research in different disciplines that points to substantial economic, social, educational and developmental benefits of participating in high-quality early childhood education and care. These benefits are not limited to the children involved, but extend to society at large. At the level of the individual, participation in high-quality early childhood education and care is associated with higher earnings, greater educational attainment, improved social integration and better health, among other advantages. Moreover, for parents, it is found to encourage labour market participation, especially of mothers, in addition to educational and other impacts. At the societal level, there are ample potential benefits as well, ranging from reduced spending on welfare and lower crime rates to higher tax revenues and improved social cohesion. In other words, the benefits are both widespread and long-lasting.

Besides the abundant research, the increased attention on early childhood education and care can also be explained by demographic and economic changes that the EU Member States have experienced over the last years. Across the EU, women's labour market participation has grown, thus increasing the demand for childcare. Moreover, as working lives are being extended, the role of grandparents in childcare is diminishing. Societies have become more diverse, in cultural and linguistic terms. Evolving career aspirations, declining fertility rates and the rising ages of those giving birth have all tremendously changed how childcare is organised. These demographic dynamics lead to an increased demand for formal childcare outside the home. In addition, informal forms of childcare are in decline in many Member States. Another factor to take into account is the past financial–economic crisis, which led governments to scale down spending on education in some Member States. Spending on early childhood education and care is generally lower than that on other education levels, despite the evidence on its importance for future learning and growth and the finding that returns on investment are higher than those for other education levels.

For these reasons, investing in early childhood education and care has been advocated by academics and policy-makers. At the EU level, there are explicit targets for it: one of the EU2020 benchmarks stipulates that at least 95% of children between the age of 4 and the age for starting compulsory primary education should participate in such education and care by 2020. Whereas the EU is close to meeting this target according to the 2016 "Education and Training Monitor"[1], the target set at the 2002 Barcelona European Council of having at least 33% of children aged under 3 participate in childcare by 2010 has still not been attained. In fact, the share remained below 20% in ten EU Member States in 2014. Furthermore, engaging children from disadvantaged groups remains a major challenge, which is particularly relevant in light of the recent inflow of refugees. Early childhood education and care can serve as an instrument to overcome disadvantage by opening up a child's world to other influences. Further efforts to support early childhood education and care will, therefore, continue to be necessary in the following years.

Against this background, this report sets out to examine possible incentives to invest in early childhood education and care in the European context. More specifically, it presents evidence on the potential benefits of early childhood education and care and the conditions under which these benefits can be realised. The report focuses on economic and other benefits, at the individual and societal level. To this end, the report starts with a conceptualisation of early childhood education and care and a description of the current state of play, while also outlining the different types of provision found in Europe. The report then discusses the potential benefits from early childhood education and care for multiple aspects, such as education and labour market outcomes, educational equalities of opportunity, social cohesion, government expenditure and revenues. Subsequently, the report looks at different types of determinants that may influence whether these potential benefits can materialise. Recent research emphasises that, in

[1] See European Commission (2016b).

this regard, both the accessibility and the quality of early childhood education and care provision matter. In others words, children need to be able to participate in high-quality ECEC in order to reap the benefits associated with it, and the same conclusion applies to the potential benefits that fall on other individuals and society. This report focuses on the roles of teachers and other staff, the system and curriculum, and the policy framework governing ECEC in ensuring affordability and quality.

From the scientific research presented in this report, it is clear that there are many incentives to invest in early childhood education and care. However, both the accessibility and quality of ECEC need to be ensured for all children, and disadvantaged children in particular. *How* early childhood education and care are provided is as important as *whether* it is provided. Towards this end, governance, organisation, and staff are key. At the governmental level, both the generosity of the spending and the monitoring of inputs and outcomes is important. With regard to spending, it is clear that ECEC is not a priority in most EU Member States, and funding has been reduced during the crisis and in its aftermath. Monitoring is a common practice in the EU. This involves monitoring the quality of the staff, service and curriculum, as well as child development, though there is much discussion on the latter. With regard to the system and curriculum, universal access appears to be more effective than targeted access in attracting children from disadvantaged groups into ECEC, but this is also more expensive. Education and care need to be combined. In addition, ECEC provisions need to have sufficient and well-trained staff, so that factors as wages, training and management also come into play. Reaping the benefits of ECEC thus implies that policy-makers need to target several fronts at the same time.

Executive Summary (French)

Dans l'Union européenne, l'éducation et l'accueil des jeunes enfants (EAJE) constitue une priorité croissante pour de nombreux États membres. Ce n'est que très récemment que l'éducation et l'accueil des jeunes enfants a commencé à recevoir une attention particulière, bien que l'éducation figure depuis longtemps parmi les priorités politiques. Cet intérêt pour la petite enfance découle de recherches scientifiques en rapide développement dans différentes disciplines. Elles mettent en évidence les avantages économiques, sociaux, éducatifs et de développement considérables de la participation des jeunes enfants à une éducation et un accueil de qualité. Ces avantages ne se limitent pas aux enfants concernés, mais s'étendent à l'ensemble de la société. Au niveau de l'individu, la participation des jeunes enfants à une éducation et un accueil de qualité est associée, entre autres avantages, à des revenus plus élevés, à un meilleur niveau d'éducation, à une meilleure intégration sociale et à une meilleure santé. Par ailleurs, il est constaté qu'elle encourage l'inclusion sur le marché du travail pour les parents, en particulier les mères, en plus des impacts éducatifs et autres. Au niveau sociétal, on retrouve également de nombreux avantages potentiels. Ceux-ci vont de la réduction des dépenses d'aide sociale et des taux de criminalité à la hausse des recettes fiscales et à l'amélioration de la cohésion sociale. En d'autres termes, les avantages sont à la fois étendus et durables.

Outre les nombreuses recherches, l'attention accrue portée à l'éducation et à l'accueil de qualité des jeunes enfants peut également s'expliquer par les changements démographiques et économiques que les États membres de l'UE ont connu ces dernières années. Dans toute l'UE, la participation des femmes au marché du travail a augmenté, ce qui a accru la demande de services d'accueil des jeunes enfants. De plus, à mesure que la vie professionnelle s'allonge, le rôle des grands-parents dans la garde de leurs petits-enfants diminue. Les sociétés se sont diversifiées, en termes culturels et linguistiques. L'évolution des aspirations professionnelles, la baisse des taux de fécondité et l'augmentation de l'âge des femmes enceintes ont profondément modifié l'organisation des services d'accueil des jeunes enfants. Ces dynamiques démographiques entraînent une demande accrue de services d'accueil formels à l'extérieur du foyer. En outre, le recours à des formes informelles de services d'accueil des jeunes enfants est en déclin dans de nombreux États membres. Par ailleurs, il convient également de tenir compte de la crise financière et économique passée, qui a conduit les gouvernements de certains États membres à réduire les dépenses dédiées à l'éducation. Les dépenses consacrées à l'éducation et l'accueil des jeunes enfants sont généralement inférieures à celles affectées aux autres niveaux d'éducation, en dépit des données probantes sur leur importance pour l'apprentissage et la croissance futurs et du fait que le retour sur investissement est supérieur à celui des autres niveaux d'éducation.

C'est pourquoi les universitaires et les décideurs politiques préconisent d'investir dans l'éducation et l'accueil des jeunes enfants. Il existe au niveau de l'UE des objectifs explicites à cet égard : l'un des indicateurs de référence de la stratégie européenne « Europe 2020 »stipule qu'au moins 95 % des enfants âgés entre 4 ans et l'âge minimum de scolarisation obligatoire, doivent participer à l'enseignement préscolaire d'ici 2020. Alors que l'UE est sur le point d'atteindre cet objectif selon le « Suivi de l'éducation et de la formation » de 2016, l'objectif fixé en 2002 par le Conseil européen de Barcelone, à savoir qu'au moins 33 % des enfants de moins de 3 ans bénéficient de services d'accueil des jeunes enfants d'ici 2010, n'a toujours pas été atteint. Dans les faits, cette part est restée inférieure à 20 % dans dix États membres de l'UE en 2014. Par ailleurs, la participation des enfants issus de groupes défavorisés reste un défi majeur, qui se révèle particulièrement important compte tenu du récent afflux de réfugiés. Les services d'éducation et d'accueil des jeunes enfants peuvent servir d'instrument pour surmonter les désavantages, en ouvrant le monde de l'enfant à d'autres influences. Des efforts supplémentaires seront donc nécessaires dans les années à venir pour les soutenir.

Dans ce contexte, le présent rapport se propose d'examiner les incitations possibles à investir dans l'éducation et l'accueil des jeunes enfants dans le contexte européen. Plus précisément, il présente des preuves sur les avantages potentiels de l'éducation et l'accueil des jeunes enfants et les conditions nécessaires pour que ces retombées puissent être obtenues. Le rapport met l'accent sur les avantages, notamment économiques, au niveau individuel comme au niveau sociétal. A cette fin, le rapport

commence par une conceptualisation de l'éducation et de l'accueil des jeunes enfants et une description de la situation actuelle, tout en décrivant également les différents types de services disponibles en Europe. Le rapport examine ensuite les avantages potentiels de l'éducation et de l'accueil des jeunes enfants pour de multiples aspects, tels que les résultats en matière de scolarité et sur le marché du travail, l'égalité des chances en matière d'éducation, la cohésion sociale, les dépenses et les revenus publics. Le rapport étudie ensuite différents types de facteurs susceptibles d'influer sur la matérialisation de ces avantages potentiels. Des recherches récentes soulignent qu'à cet égard, l'accessibilité et la qualité des services d'éducation et d'accueil des jeunes enfants sont des points importants. En d'autres termes, les enfants doivent pouvoir prendre part à une EAJE de haute qualité afin d'en tirer pleinement profit. La même conclusion s'applique aux avantages potentiels qui incombent aux autres individus et à la société. Le présent rapport met l'accent sur le rôle des enseignants et autres catégories de personnels, sur le système et les programmes d'études ainsi que sur le cadre stratégique régissant l'EAJE afin d'assurer son abordabilité et sa qualité.

D'après les recherches scientifiques présentées dans ce rapport, il est clair qu'il existe de nombreuses incitations à investir dans l'éducation et l'accueil des jeunes enfants. Toutefois, l'accessibilité et la qualité de l'EAJE doivent être assurées pour tous les enfants, et en particulier pour les enfants défavorisés. La façon dont l'éducation et l'accueil des jeunes enfants sont pourvus est aussi importante que la question de savoir s'ils le sont ou non. A cette fin, la gouvernance, l'organisation et le personnel sont essentiels. Au niveau gouvernemental, tant la générosité des dépenses que le suivi des moyens et des résultats sont importants. En ce qui concerne les dépenses, il est clair que l'EAJE ne représente pas une priorité dans la plupart des États membres de l'UE et que le financement a été réduit pendant la crise et par la suite. Le suivi est une pratique courante dans l'UE. Il s'agit de surveiller la qualité du personnel, des services et des programmes d'études, ainsi que le développement de l'enfant, même si ce dernier point fait l'objet de longues discussions. En ce qui concerne le système et les programmes d'études, l'accès universel semble plus efficace que l'accès ciblé pour attirer les enfants des groupes défavorisés vers l'EAJE, mais il se révèle aussi plus coûteux. L'éducation et l'accueil doivent être combinés. De plus, les services d'EAJE doivent être dotés d'un personnel suffisant et bien formé, de sorte que certains facteurs comme les conditions salariales, la formation et la gestion entrent également en ligne de compte. Tirer profit des avantages de l'EAJE implique donc que les décideurs politiques doivent agir sur plusieurs fronts simultanément.

Executive Summary (German)

Viele Mitgliedstaaten der Europäischen Union legen inzwischen viel Wert auf frühkindliche Betreuung, Bildung und Erziehung. Während Bildung schon seit längerem weit oben auf der politischen Agenda steht, bekommt die frühkindliche Betreuung, Bildung und Erziehung (FBBE) jedoch erst seit kurzem mehr Aufmerksamkeit. Dieses Interesse für die frühen Jahre wird durch die schnell wachsende Zahl wissenschaftlicher Untersuchungen in diversen Fachrichtungen angeregt, die zeigen, dass eine hochwertige FBBE mit wesentlichen wirtschaftlichen, sozialen, schulischen und entwicklungspsychologischen Nutzen verbunden ist. Diese Nutzen bleiben nicht auf die betreuten Kinder beschränkt, sondern wirkt sich auf die Gesellschaft als Ganzes aus. Auf der individuellen Ebene ist die Teilhabe an einer hochwertigen FBBE unter anderem mit einem höheren Einkommen, höheren Bildungsabschlüssen, einer besseren sozialen Integration und gesundheitlichen Vorteilen verbunden. Und sie wirkt sich nicht nur positiv auf den Bildungserfolg der Kinder aus, sondern erleichtert auch die Teilnahme der Eltern, insbesondere der Mütter, am Arbeitsmarkt. Auch auf gesellschaftlicher Ebene gibt es zahlreiche Nutzen, z. B. sinkende Sozialausgaben, weniger Kriminalität, höhere Steuereinnahmen und ein bessere soziale Zusammenhalt. Anders ausgedrückt, sind die Vorteile vielfältig und dauerhaft.

Das zunehmende Interesse für FBBE lässt sich aber nicht nur mit den umfangreichen Forschungsergebnissen, sondern auch mit dem demografischen und wirtschaftlichen Wandel erklären, den die Mitgliedstaaten der EU in den letzten Jahren durchlebten. In der gesamten EU ist die Beteiligung von Frauen am Arbeitsmarkt gestiegen; was sich auf die Nachfrage nach Betreuungsangeboten auswirkt. Gleichzeitig sinkt die Bedeutung der Großeltern bei der Kinderbetreuung, weil sich die Lebensarbeitszeit immer weiter verlängert. Die Gesellschaften sind kulturell und sprachlich vielfältiger geworden. Ehrgeizigere Karrierewünsche, sinkende Geburtenraten und das zunehmende Alter der Gebärenden haben die Organisation der Kinderbetreuung grundlegend verändert. Aufgrund dieser demografischen Trends steigt die Nachfrage nach einer formalen Kinderbetreuung außerhalb der Familie. Außerdem nehmen informelle Formen der Kinderbetreuung in vielen Mitgliedstaaten ab. Ein weiterer wichtiger Faktor ist die letzte Finanz- und Wirtschaftskrise, die die Regierungen einiger Mitgliedstaaten dazu gezwungen hat, die Mittel für Bildung zu kürzen. Obwohl die Bedeutung der FBBE für den künftigen Bildungserfolg und das Wachstum klar erwiesen ist und die Forschung zeigt, dass Investitionen in diesem Bereich mehr Rendite bringen als in anderen Bildungsstufen, sind die Ausgaben für die FBBE insgesamt niedriger als die für andere Bildungsstufen.

Aus diesen Gründen sprechen sich sowohl die Wissenschaft als auch die Politik für Investitionen in die FBBE aus. Auf europäischer Ebene wurden bereits konkrete Zielvorgaben festgelegt: eine der Benchmarks der Strategie Europa 2020 sieht vor, dass mindestens 95 % der Kinder im Alter zwischen vier Jahren und dem gesetzlichen Einschulungsalter in den Genuss einer Vorschulbildung kommen sollen. Nach Daten des „Monitor für die allgemeine und berufliche Bildung“ der Europäischen Kommission für 2016 hat die EU diese Quote zwar fast erreicht, aber das 2002 vom Europäischen Rat von Barcelona beschlossene Ziel, bis 2010 für mindestens 33 % der Kinder unter drei Betreuungsplätze zu schaffen, wurde jedoch verfehlt. Im Jahr 2014 lag die Quote in zehn Mitgliedstaaten sogar noch unter 20 %. Insbesondere die Bereitstellung von Betreuungsangeboten für Kinder aus benachteiligten Gruppen bleibt ein Problem, das sich durch den aktuellen Zuzug von Flüchtlingen noch verschärft. Frühkindliche Betreuung, Bildung und Erziehung öffnet eine neue Welt von Einflüssen für Kinder und kann so sozio-ökonomische Benachteiligungen ausgleichen. Daher sind in den kommenden Jahren weitere Anstrengungen zur Förderung der FBBE erforderlich.

Vor diesem Hintergrund untersucht dieser Bericht mögliche Anreize für Investitionen in die FBBE im europäischen Kontext. Konkret stellt der Bericht Daten über die potenziellen Nutzen der FBBE und über die Bedingungen bereit, unter denen diese Nutzen erzielt werden können. Dabei konzentriert sich der Bericht auf die wirtschaftlichen und sonstigen Nutzen auf individueller und gesellschaftlicher Ebene. Zu diesem Zweck beginnt der Bericht mit einer Konzeptualisierung von frühkindlicher Betreuung, Bildung und Erziehung sowie einer Beschreibung der aktuellen Situation und der unterschiedlichen

Betreuungsformen in Europa. Danach erläutert der Bericht die potenziellen Nutzen der FBBE in unterschiedlichen Bereichen, z. B. Bildungserfolg und Erfolg auf dem Arbeitsmarkt, besser Chancengleichheit in der Bildung, sozialer Zusammenhalt und öffentliche Ausgaben und Einnahmen. Anschließend untersucht der Bericht, von welchen Faktoren es abhängt, ob diese Nutzen tatsächlich realisiert werden können. Aktuelle Forschungsdaten betonen, dass in dieser Hinsicht sowohl die Verfügbarkeit als auch die Qualität von FBBE wichtig sind. Anders ausgedrückt, brauchen Kinder Zugang zu einer hochwertigen FBBE, um in den Genuss ihrer Vorteile zu kommen; dies gilt auch in Bezug auf die Nutzen für andere Personengruppen und die Gesellschaft als Ganzes. Der Schwerpunkt dieses Berichts liegt hier auf der Rolle von Lehrern, Pädagogen und sonstigen Mitarbeitern, auf dem System und Lehrplan und auf den politischen Rahmenbedingungen, von denen Kosten und Qualität der FBBE abhängen.

Die in diesem Bericht präsentierten wissenschaftlichen Untersuchungen zeigen, dass es viele gute Gründe gibt, in FBBE zu investieren. Dabei muss jedoch gewährleistet sein, dass FBBE von hoher Qualität und für alle Kinder zugänglich ist, insbesondere für benachteiligte Kinder. *Wie* FBBE bereitgestellt wird, ist genauso wichtig, wie *dass* sie bereitgestellt wird. Die wichtigsten Faktoren in dieser Beziehung sind gesetzliche Rahmenbedingungen, Organisation und Personal. Auf Regierungsebene sind sowohl die Höhe der Ausgaben als auch die Kontrolle von Indikatoren und Ergebnissen wichtig. Haushaltstechnisch ist deutlich, dass FBBE in den meisten Mitgliedstaaten keine Priorität hat und in diesem Bereich während und auch nach der Krise Mittel gestrichen wurden. Politische Kontrolle ist in der EU üblich. Kontrolliert werden unter anderem die Qualität von Beschäftigten, Angeboten und Lehrplänen sowie die Entwicklung der Kinder, obwohl letzteres heftig diskutiert wird. In Bezug auf System und Lehrplan scheint ein universeller Ansatz besser zu funktionieren als ein Ansatz, der speziell Kinder aus benachteiligten Gruppen in die FBBE integrieren soll. Allerdings ist ein universeller Ansatz auch teurer. Betreuung, Bildung und Erziehung müssen kombiniert werden. Außerdem brauchen FBBE-Angebote ausreichend und gut ausgebildete Mitarbeiter, wodurch auch Faktoren wie Gehälter, Ausbildung und Management ins Spiel kommen. Damit die FBBE ihren vollen Nutzen entfalten kann, muss die Politik also an mehreren Fronten aktiv werden.

1. Introduction

Early childhood education and care has the potential to give all young people a good start in the world of tomorrow and to break the cycle which transmits disadvantage from one generation to another.

European Commission (2011)

Participation in high-quality early childhood education and care (ECEC) has been recognised as a fundamental step in children's development as it lays the foundation for future growth and learning. The benefits of ECEC for individuals – during every stage of their lives – as well as for society at large have been documented in numerous contributions across a range of academic disciplines (see a.o. Heckman and Masterov, 2004; Heckman, 2006). ECEC has been associated with improved educational, labour market and social outcomes, such as higher earnings, better chances of completing high school, and improved health. Such individual benefits are not limited to the child but also extend to the family, as ECEC provision, for example, enables the labour market participation of mothers and single parents. Moreover, the associated societal benefits should also be acknowledged, with reduced crime rates and higher tax revenues being two well-known examples. Previous research has pointed to the importance of ECEC for disadvantaged children, for example those from migrant backgrounds or from low-income families. ECEC can level the playing field, contribute to equal opportunities for all children and reduce inequalities as a result.

At the same time, the demand for the provision of early childhood education and care has grown over the last decades, driven by the increased female labour market participation and the extension of working lives. Moreover, the technological, demographic and economic changes that the EU has witnessed have once again put the topic of education high on the public agenda. Technological change and digitalisation have increased the demand for skilled labour across the EU. Enrolment in tertiary education has been on the rise, and so has participation in ECEC (OECD, 2015). In the EU28, the percentage of children younger than 3 participating in formal childcare increased from 28% in 2010 to 30.3% in 2015. The percentage of children of ages 3 to the age of entry into compulsory education participating in formal childcare remained stable, at around 84%, over the same period. Within this age group, a growing number of children participates for at least 30 hours (45% in 2010 and 49.4% in 2015).

Against this background, early childhood education and care has been a growing priority in many EU Member States. Over the last two decades, policy-makers have started to devote special attention to it as part of education policy. Whereas in some Member States this focus is relatively new, it has had a longstanding history in others. Education, being a national rather than an EU-level competence, has traditionally been approached in various ways across the Union, reflecting the national institutional context and preferences.

Notwithstanding the considerable heterogeneity, EU-level policy-makers have advocated investment in ECEC because of its potentially beneficial effects. This is, for example, reflected in the Barcelona targets introduced in 2002, aimed at supporting the development of childcare facilities for young children in Europe with a view to sustainable and inclusive growth. Despite that participation rates have increased, on average, some countries still have a long way to go. A few Member States have even seen a decline in the ECEC participation rates. In this debate, however, the impact of the recent financial–economic crisis should not be overlooked. Government spending cuts and financial constraints on families affect the provision of and participation in ECEC. Yet, its relevance may even grow under these conditions.

This report sets out to describe the potential economic and non-economic benefits of early childhood education and care, as well as the conditions under which these benefits can be realised. It starts with a conceptualisation of early childhood education and care, presenting a brief overview of the different forms of provision that exist. The research then reviews the literature on the potential benefits associated

with early childhood education and care, considering the individual and societal level, and distinguishing between the short- and long-run benefits.

This report also looks into the conditions that need to be fulfilled in order for ECEC provision to bring the expected benefits and help in addressing societal challenges, in present-day contexts of diversity and inequality. These conditions are to be situated on several levels, including those of governance, provisions and staff. Indeed, early childhood education is first and most importantly a very personalised matter and the skills and competences of staff crucially contribute to ECEC quality as well as to children's outcomes. Staff training and supervision are, therefore, central quality criteria. At the level of the provision, the working conditions matter, as well as how the curriculum is shaped and the extent to which child-led and adult-led activities are balanced. Finally, at the governmental level, funding and monitoring policies highly influence the systemic quality.

The evidence presented in this analytical report was assembled on the basis of desk research. It builds on an extensive body of academic literature from different disciplines, which is further complemented with policy reports and contributions from leading international organisations that have worked on ECEC-related matters, including the Organisation for Economic Co-operation and Development (OECD) and the United Nations Children's Fund (UNICEF). Both the EU perspective and the perspective of the Member States are taken into account. To the extent possible, the analysis is based on work that is specific to the European context – even though longitudinal evidence is more prevalent with respect to the US.

The remainder of the report is organised as follows. Section 2 is devoted to the conceptualisation of ECEC in the literature. It first defines what is understood under early childhood education and care. In a second subsection, it presents an overview of the different types of provision that exist, making the distinction between unitary and split systems, home- and centre-based provision, and other differentiations. Section 3 focuses on the potential benefits, distinguishing between economic and non-economic benefits, and further separating individual benefits from those for society at large. Economic benefits include, but are not limited to, outcomes related to educational attainment, labour market status, taxation and social security. Non-economic benefits pertain to social inclusion and social cohesion, among others. Individual benefits for children as well as their parents are assessed. Section 4 deals with the conditions under which these potential benefits can be realised. It highlights the importance of both the accessibility and quality of ECEC and outlines the factors that contribute to each of them. More specifically, the section analyses the roles of teachers and ECEC staff, of the school system and the curriculum, and of the policy framework. The final section, section 5, concludes the report and formulates policy recommendations.

2. Conceptualisation of early childhood education and care and its forms

2.1 What is early childhood education and care?

Early childhood is traditionally regarded as the period from birth to age 8 of an individual's life. It is a period in life that is among the most formative and essential for further development (e.g. in physical, social, emotional and cognitive terms) and has a profound and long-lasting impact on a person's future, as is evidenced by abundant research across different disciplines, such as neuroscience and psychology (see Heckman, 2006; Van Laere and Vandenbroeck, 2017). Especially in the early years, education and learning, in different forms, can have strong effects on child development.

Early childhood education and care is defined by the European Commission as "provision for children from birth through to compulsory and primary education that falls within a national regulatory framework, i.e. it has to comply with a set of rules, minimum standards and/or undergo accreditation procedures" (European Commission, EACEA, Eurydice and Eurostat, 2014). This conceptualisation is used across different publications and outputs produced by the Commission, and has, in related forms, also been adopted by international organisations and other institutes. The OECD, for example, considers it to mean "all arrangements providing care and education for children under compulsory school age, regardless of setting, funding, opening hours, or programme content" (OECD, 2001).

Whereas the OECD definition is rather broad and covers all types of arrangements, regardless of the setting, funding or content of the programmes, other work has taken a narrower perspective.[2] In the *Key Data on Early Childhood Education and Care in Europe 2014* report (European Commission, EACEA, Eurydice and Eurostat, 2014), for example, the focus is only on mainstream provision, i.e. the most common, well-established types of ECEC provision available to all children. It does not consider settings operating outside normal hours (e.g. holiday programmes), pilot, experimental or temporary provision, or 'specialist' provision (e.g. linked to hospitals or orphanages). The report further excludes so-called 'open' early childhood education services organised for children and their families (e.g. mother/child centres).

The UN has also developed a frequently used conceptualisation of early childhood education and care, as part of its International Standard Classification of Education (ISCED). In ISCED 2011 (which is the most recent edition) prepared by the UN Educational, Scientific and Cultural Organisation (UNESCO), early childhood education is at ISCED level 0. It consists of two types of programmes: i) early childhood educational development programmes targeting children below the age of 3 (ISCED 01(0) Early childhood educational development); and ii) early childhood educational development programmes developed for children from the age of 3 to the start of primary education (which varies from one country to another) (ISCED 02(0) Pre-primary education).

In this report, we use the same conceptualisation of early childhood education and care as the European Commission. The focus of the report is mainly on institutionalised, formal ECEC provision, though in a few instances also other types of provision are discussed. To account for the differences in the age of entry into compulsory and primary education, whenever possible information will be provided on the ages covered by specific programmes and data will be presented for both ISCED 01 and ISCED 02 programmes (besides data for ISCED 0 more generally).

[2] Another issue with the OECD definition is that the age to enter into compulsory education varies across the EU Member States, which makes it difficult to compare results.

2.2 Typology of early childhood education and care provision

ECEC provision exists in many forms and is organised in different ways across the EU Member States. Provision for children below the compulsory schooling age is widespread, but differs in terms of funding, organisational set-up, responsible authorities, staff requirements, enrolment age, intensity of the programme (number of hours, full-time or part-time participation) and other aspects (Akgündüz et al., 2015; Melhuish, 2014; Bertram and Pascal, 2016). In the literature, ECEC provision is typically categorised into unitary (integrated) or split systems, public or private settings, and centre-based or home-based provision, among others. Importantly, despite the ongoing decline in informal childcare and the further expansion of formal provision, informal care remains relevant across the EU. In 2011, for example, 50% of the children younger than 3 in the EU28 were only taken care of by their parents (i.e. not enrolled in a centre- or home-based provision, neither being taken care of by other adults) (European Commission, EACEA, Eurydice and Eurostat, 2014).

Notwithstanding this diversity in early childhood education and care provision, a common feature is that many programmes combine the education and care functions (OECD, 2015). In a few cases, care-only or education-only provision can be found. Care-only provision tends to exist particularly, but not just for younger children (e.g. in the Czech Republic, the Netherlands, Portugal and Slovakia). Education-only provision appears to be less common. In several countries, ECEC is increasingly focused on its educational tasks (i.e. formal learnings) and scholars worry that this is to the detriment of the caring dimensions as well as play and relationality (e.g. Broström, 2006; Van Laere, 2017). As young children learn through playing, a holistic approach integrating education and care is important to support child development (Van Laere and Vandenbroeck, 2017).

Unitary and split systems

A first distinction to be made within ECEC provision is that between unitary (or integrated) and split systems (European Commission, EACEA, Eurydice and Eurostat, 2014; Bertram and Pascal, 2016). In *split systems*, children are organised into ECEC provision according to their age – typically children younger than 3 are separated from those older than 3 (but there is country-level variation in this cut-off level). In a split system, the younger children are often cared for in childcare provision (non-school), whereas the older children participate in pre-primary education (sometimes organised in the same location as primary education). Responsibility for ECEC in split systems is often divided among multiple authorities, which operate at different levels of government (e.g. national, regional or local) or cover different policy domains (e.g. ministries of education or health). As a result, disparities between the provision for younger and older children in terms of access, legal entitlement, staff qualifications and other factors are likely to occur.

In *unitary systems*, ECEC provision for children is not organised by age group. Access is usually free and legal entitlement is granted from a very early age. Unitary systems are generally managed by the ministry of education. Yet, even in unitary systems, there may be pre-primary ECEC provision to which other rules and conditions apply (e.g. provision already organised in a primary school setting).

Bertram and Pascal (2016) report that split systems are more common than unitary systems in Europe. In some EU Member States, both types of ECEC provision are prevalent (e.g. Austria, Bulgaria, Denmark, Germany and Spain). Interestingly, especially in recent years there seems to be a trend towards the integration of ECEC provision (for instance, in Austria, where a joint-school entry phase was introduced, see e.g. OECD, 2017). This trend may result in more coherent system. Bennett (2008) further reports that unitary systems provide higher-quality ECEC and more universal and affordable access to ECEC. Kaga et al. (2010) similarly find that split systems, due to their structure and governance (e.g. in terms of staff, access and funding), may result in inequality and a lack of continuity. A related point to take into consideration here is admission criteria. Inequalities may be exacerbated when there is strong residential sorting in the provisions that children can enrol in. Free choice of provision can also increase inequalities, for example when children are admitted on the basis of their performance.

Studies have shown that transitions between subsystems are a risk for underprivileged children and therefore may contribute to inequality in later school outcomes (Rimantas et al., 2014). In its latest report on ECEC, *Starting Strong IV*, the OECD (2017) advocates the integration of services and in the case of split systems, looking very carefully at transitions between subsystems.

Centre-based and home-based systems

A second common distinction is that between centre- and home-based provision. *Centre-based ECEC provision* is that provided outside the home, such as nurseries, day-care centres, kindergartens or crèches. *Home-based ECEC provision* is delivered in a provider's home (e.g. in the child's own home or elsewhere). In addition to these two types, *school-based provision* exists in some Member States (i.e. ECEC provision organised at the premises of a school, which typically also offers primary education). All of these types are regulated and have to meet a series of requirements and conditions. Centre-based care can be organised into separate centres for different age groups (e.g. separating those younger than 3 from those who are older), but this is not always the case.

In many Member States, both centre-based and home-based provision are available. Unfortunately, data on enrolment rates in home-based versus centre-based ECEC are scare and the estimates on home-based ECEC presented in the EU-SILC database are deemed unreliable by European Commission, EACEA, Eurydice and Eurostat (2014). For these reasons, it is difficult to assess how widespread home-based ECEC is in comparison with centre-based provision. Nevertheless, for some countries data are available. For these countries, it appears that home-based provision plays a much smaller role than centre-based provision, with the exception of Belgium, Denmark, Germany, France, Finland and the UK –especially for the youngest children (European Commission, EACEA, Eurydice and Eurostat, 2014).

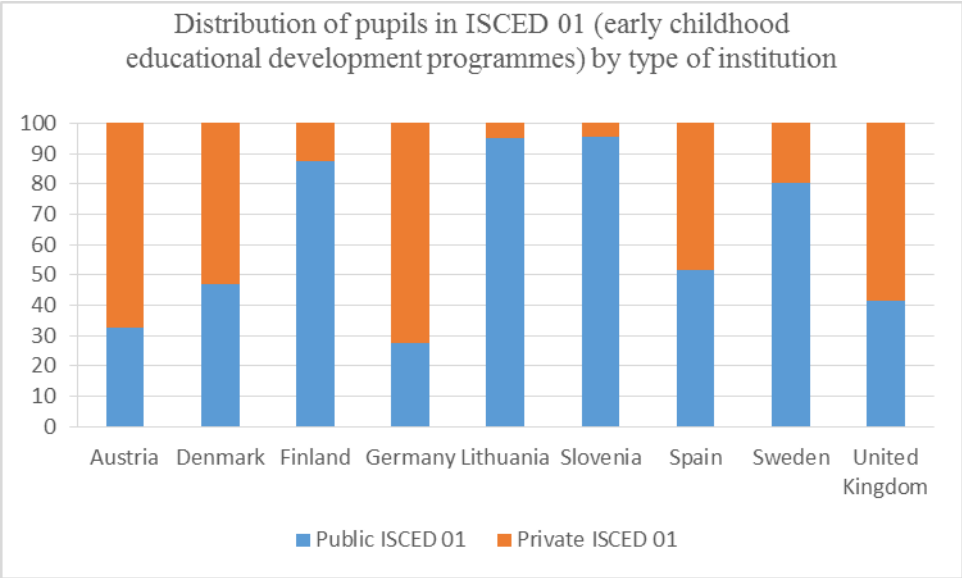
In some Member States hybrid systems have emerged, somewhat blurring the boundaries between home-based and centre-based provision. In France, the *crèches satellites* consist of two to three childminders attached to a day-care centre (Bouve and Sellenet, 2011). In the Flemish Community of Belgium, an experiment has been run whereby two or three childminders provide childcare in a setting offered by the local municipality (www.kindengezin.be). Likewise, in Germany there are attempts to integrate both forms of childcare (Wiemert and Heeg, 2012; see also Bauters and Vandenbroeck, 2017, for a discussion). In Denmark *Legestuer* are organised as meeting places where family day-care providers can meet with their children (see also an overview of innovative policies for family day care in Boogaard et al., 2014).

Public and private provision[3]

Another distinction is that between the public, private and other (e.g. voluntary) sectors and the ECEC provision that each offers. According to OECD data in the 2016 edition of *Education at a Glance*, there is a mix of public and private provision available in most EU Member States. Despite the limited data available for children enrolled in early childhood educational development programmes (ISCED 01), it is clear that there is variety in enrolment rates in public and private institutions across Europe: while in Germany, Austria and the UK, a large share of children is enrolled in private provision, the opposite holds for Finland, Lithuania and Slovenia (as is illustrated in Figure 1 below). This heterogeneity seems to be somewhat reduced when a similar illustration is presented for enrolment in pre-primary education (ISCED 02, shown in Figure 2). In this case, most children appear to be enrolled in public provision.

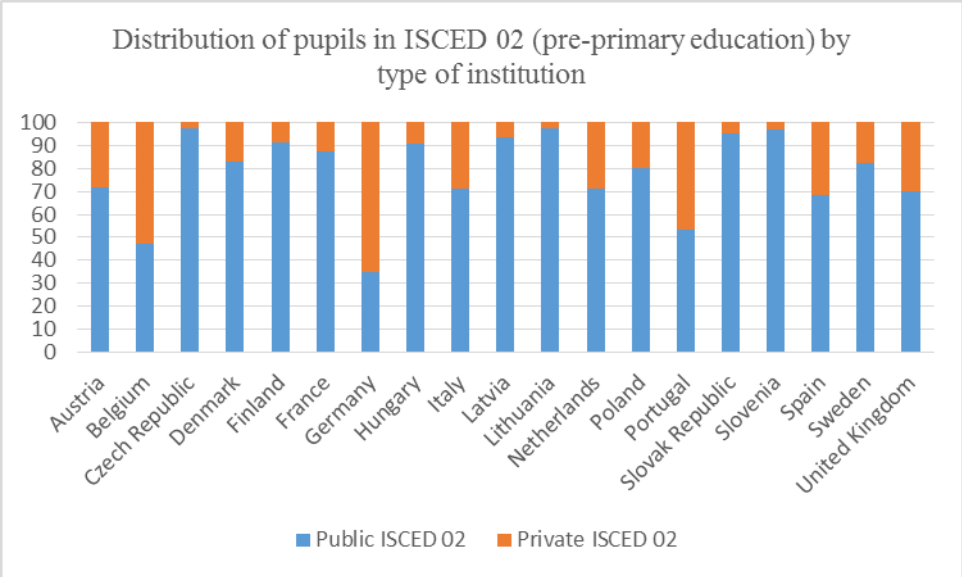
[3] The distinction between public and private ECEC provisions here refers to the funding of the provisions.

Figure 1. Distribution of pupils in early childhood educational development programmes across public and private institutions



Note: Only countries are shown for which data were available in the OECD dataset.
Source: Own elaboration, based on the OECD (2016) *Education at a Glance* report.

Figure 2. Distribution of pupils in pre-primary education across public and private institutions



Note: Only countries are shown for which data were available in the OECD dataset.
Source: Own elaboration, based on the OECD (2016) *Education at a Glance* report.

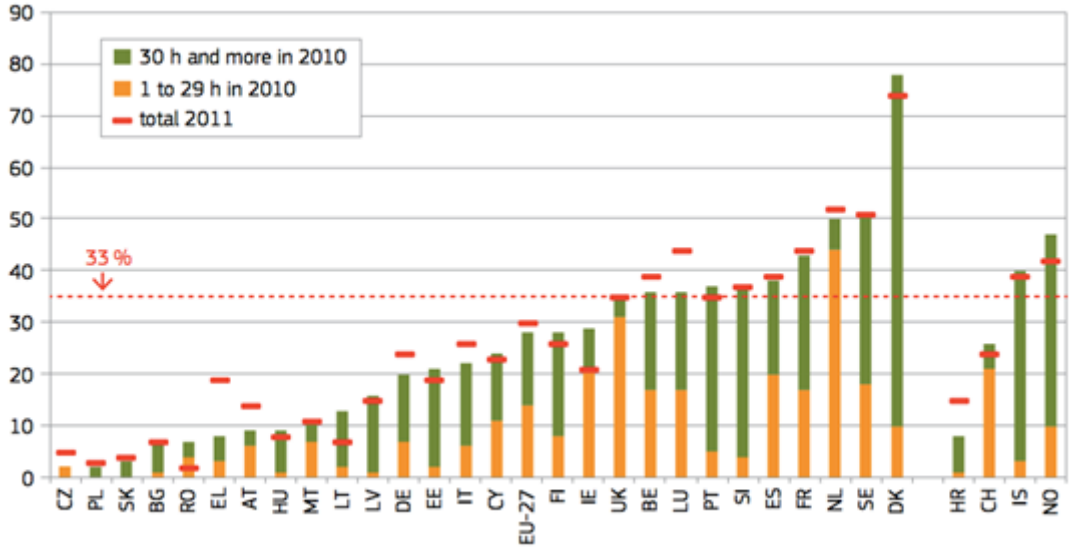
2.3 Participation in early childhood education and care in Europe

In 2002, the Barcelona European Council set objectives about the availability of high-quality, affordable childcare facilities for young children from birth to compulsory school age (European Parliament, 2002). The objectives required EU Member States to provide childcare by 2010 to at least 90% of children between the age of 3 and the mandatory school age, and at least 33% of children under 3 years of age. An evaluation of these targets in 2013 showed that they had not yet been met (European Parliament, 2013). Overall, the 2013 evaluation report listed only six EU countries that had achieved both targets, six that had reached one target, and another three that were close to doing so. Twelve Member States had reached none of the targets. These results are illustrated in the figures depicted below (see Figure 3,

Figure 4 and Figure 5)[4]. Overall, an increase in investment in early childhood education is to be noted in most European regions. Notwithstanding this result, the figures clearly uncover geographical patterns, with enrolment rates being particularly low in Central and Eastern Europe. In these countries, informal care is likely to play a much larger role.

Despite these results, the need for additional formal childcare will only increase, as informal childcare by grandparents is rapidly decreasing across the EU (as a result of rising pension ages). Moreover, most countries that saw a substantial increase in home-based childcare in the 1980s and 1990s are now witnessing a dramatic decrease of this form of childcare, which is generally cheaper, and are therefore facing important budgetary challenges (Bauters and Vandenbroeck, 2017). While participation in early childhood education for children between age 3 and compulsory school age has increased over the years, the European average (86%) is still significantly below the Barcelona objective. Some countries (Romania, Spain, Cyprus and Ireland) have even seen a decline in their coverage.

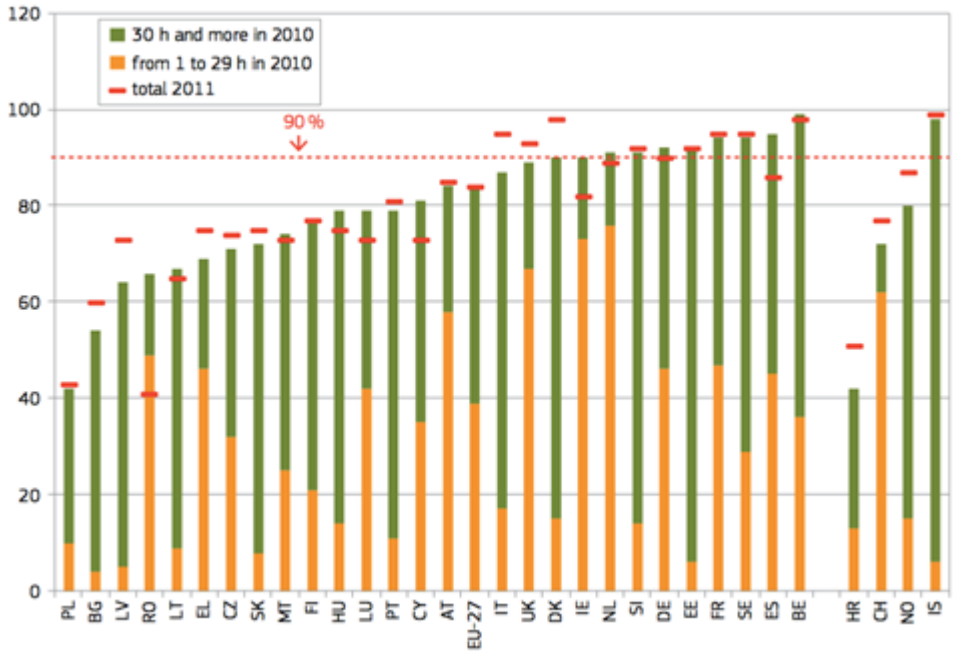
Figure 3. Percentage of children younger than 3 cared for in formal structures in 2010–11



Source: Eurostat – EU-SILC 2010–2011 in European Parliament (2013).

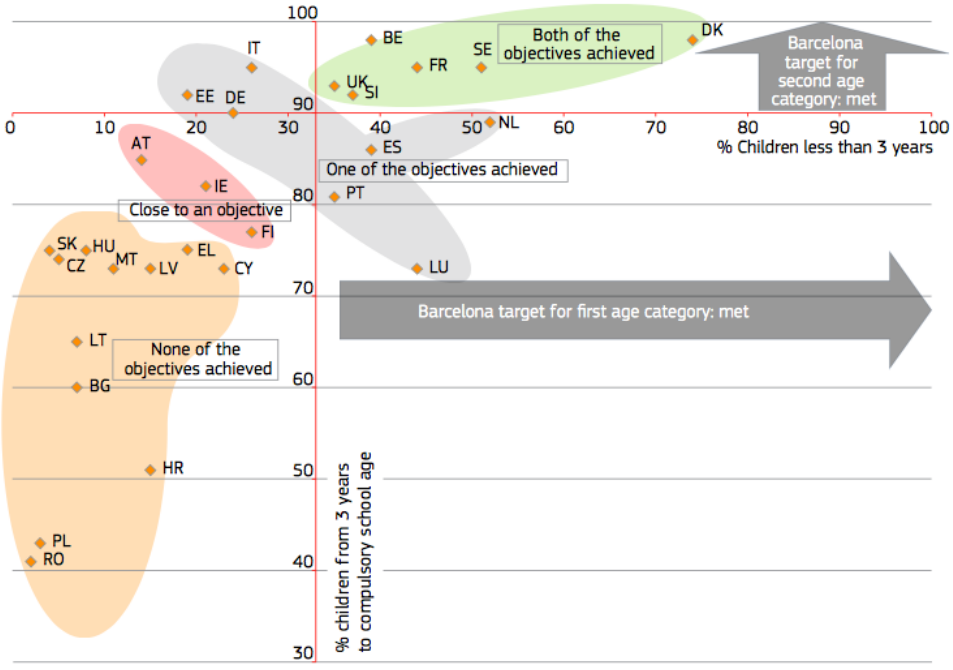
[4] Note that the numbers presented in these figures are taken at the time of the evaluation. The most recent data reveal the following trends for the EU28: in 2015, the percentage of children younger than 3 in formal childcare from 1 to 29 hours stood at 14.7% and 30 hours and more stood at 15.6% (or 30.3% in total). This implies that also in 2015, the target of at least 33% of children under 3 years of age enrolled in formal childcare had not been met. When participation in ECEC for children between the age of 3 and the compulsory school age is considered, the data reveal that 33.9% of them participate between 1 and 29 hours, and 49.4% 30 hours or more (83.3%). The same conclusion regarding the Barcelona targets is reached here.

Figure 4. Percentage of children between the age of 3 and the mandatory school age cared for in formal structures in 2010–11



Source: Eurostat – EU-SILC 2010–2011 in European Parliament (2013).

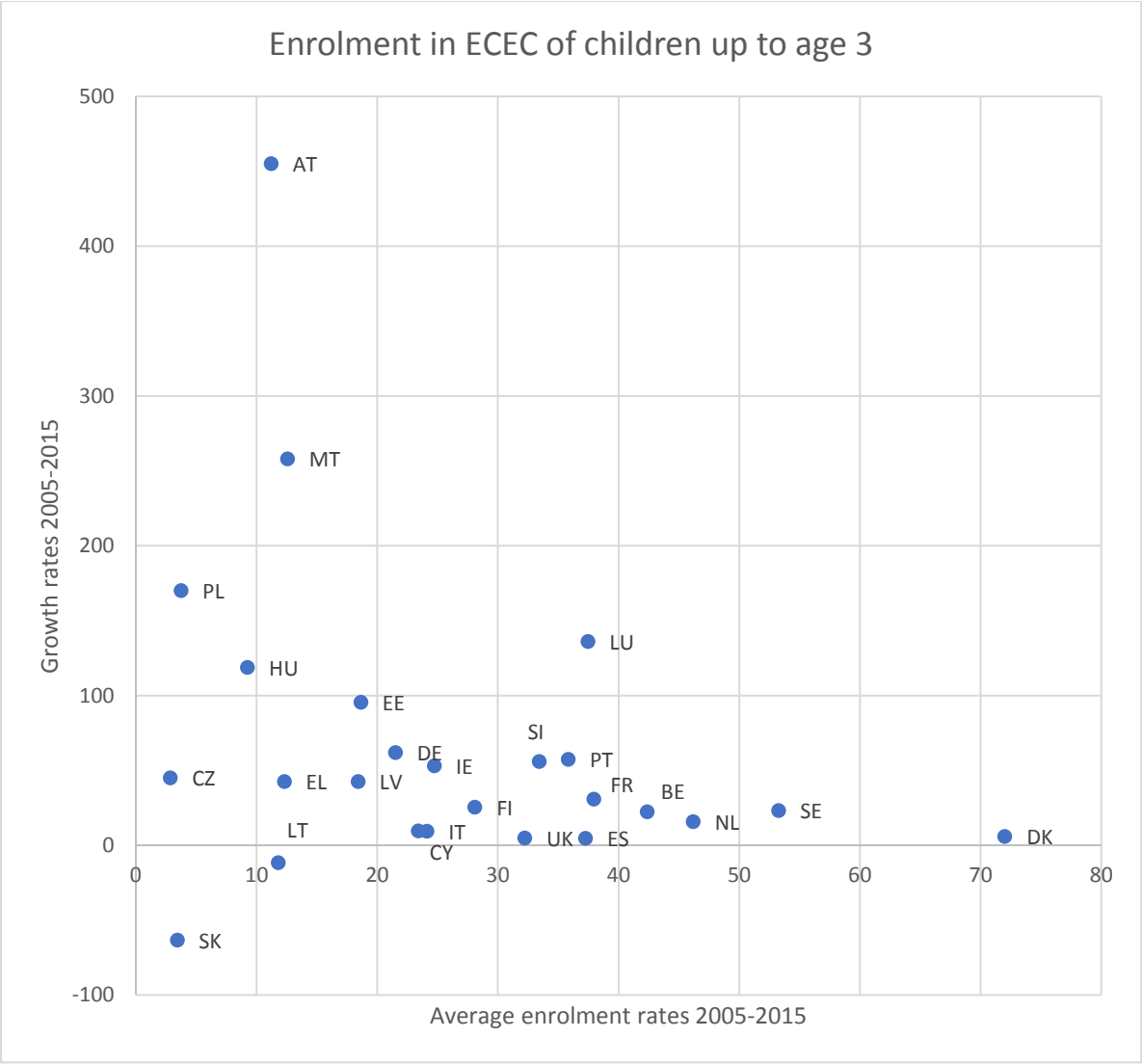
Figure 5. Formal childcare by age category in relation to the Barcelona targets



Source: Eurostat – EU-SILC 2010–2011 in European Parliament (2013).

Figure 6 and Figure 7 illustrate how average enrolment rates in ECEC provision and growth in enrolment rates are connected. Both charts have the average enrolment rate over 2005-2015 on the x-axis and the growth rate in the enrolment rate over 2005-2015 on the y-axis. In that way, both figures show whether or not there is convergence in ECEC enrolment in the EU.

Figure 6. Enrolment into formal ECEC provision of children younger than 3

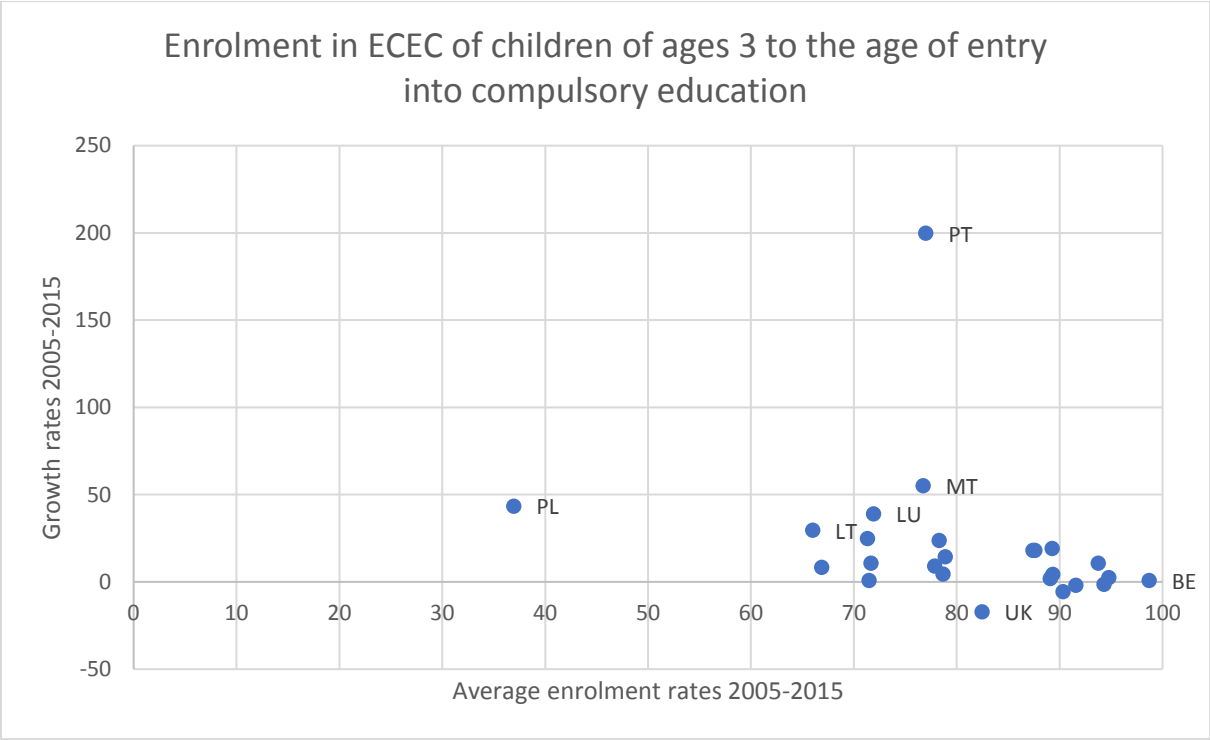


Note: EU Member States for which either data for year 2005 or year 2015 are missing are disregarded.
Source: Eurostat – EU-SILC.

Figure 6 indicates that the average enrolment rates into formal ECEC structures vary a lot in the EU28, with low to medium rates in most of the countries. Especially in Denmark, Sweden, the Netherlands and Belgium, enrolment rates are higher than the average. At the same time, it also becomes clear that highest growth rates are recorded for the countries with the lowest averages – though not always. In fact, growth rates are negative for Lithuania (-12%) and Slovakia (-63%), meaning that there was actually a decline in the enrolment rates over period 2005-2015 in these countries.

The results in Figure 7 cover enrolment rates of children of ages 3 until the age of entry into compulsory education. Here, it becomes clear that average enrolment rates are much higher than for younger children in all Member States and that there is less variety, nearly all countries have an average enrolment rate between 60 and 100%. Similarly, growth rates are much lower than in Figure 6 and much more similar across the countries (Portugal being a notable exception). It is important to mention here, however, that more countries have negative growth rates: Spain (-2%), France (-1.5%), Italy (-5.6%) and the UK (-17.3%) when comparing enrolment rates for 2015 and 2005.

Figure 7. Enrolment into formal ECEC provision of children of ages 3to the age of compulsory entry into primary education



Note: EU Member States for which either data for year 2005 or year 2015 are missing are disregarded.
Source: Eurostat – EU-SILC.

Nevertheless, overall (average) figures and comparisons between Member States may be misleading as they do not account for inequalities in access *within* Member States. Recent studies based on quantitative data analyses (Van Lancker and Ghysels, 2016) and comprehensive literature reviews (Lazzari and Vandenbroeck, 2012; Vandenbroeck and Lazzari, 2014) illustrate that children from higher socio-economic statuses are more often enrolled in ECEC of high quality than their counterparts from lower socio-economic statuses. In fact, inequality in access to and use of childcare services is the norm rather than the exception in European and OECD countries (Van Lancker, 2013; Van Lancker and Ghysels, 2012). In Denmark, Iceland and Estonia, inequalities are small and children from different social backgrounds are more or less equally represented in formal childcare services. In all other countries, children with less well-educated mothers are less likely to use formal childcare services than children whose mothers have a higher level of education. Inequalities are moderate in Sweden, Norway, Slovenia, Cyprus, Spain and Italy, and are highest in low-use countries such as Poland, Romania, Bulgaria, the UK, Ireland, Austria and Lithuania (Van Lancker and Ghysels, 2016). While initially inequalities in enrolment were attributed to parental choice, it has now become clear that it is much more the result of environmental constraints and welfare organisation (Vandenbroeck and Lazzari, 2014).

At the policy level, it has been demonstrated that services aimed at providing *universal access* (such as those in Finland, Norway, Denmark and Estonia) are much more efficient in reaching underprivileged families than jurisdictions where childcare is targeted at these populations (such as the Sure Start centres in England). Jurisdictions with universal provision and where ECEC is a legal entitlement have the most equal enrolment rates. Notably, *marketisation and commodification* –i.e. the expansion of the private ECEC sector- seem to go hand in hand with increasing inequalities, even when compensated by a voucher system for parents in need. Funding the demand side is less effective than funding the provision, with respect to both equality of access and quality of provision (Moss, 2009; Van Lancker and Ghysels, 2016). An increasing body of research suggests that for-profit childcare provision might be associated with lower quality, higher private costs and problems of rationing, especially in disadvantaged neighbourhoods (OECD, 2011a).

While universal access is a necessary condition for equal enrolment, it is not a sufficient condition. Illustrative is the case of Belgium, where access to full-day ECEC is universal and free for all children from age 2.5 onwards, yet presence is unequal. Children from ethic minority families in general (e.g. Roma) and from Central and Eastern Europe in particular are more frequently absent from preschool. Recent research has revealed that parents in these countries in particular prefer to keep their children at home because ECEC is increasingly focus on early learning (education), not care (Van Laere and Vandenbroeck, 2017). This is illustrative of the fact that equality in access is not only a matter of accessibility, availability and affordability, but also of usefulness and comprehensibility of the services for those who the services consider to be their users (Vandenbroeck and Lazzari, 2014).

3. Potential benefits of early childhood education and care

There is extensive academic literature, extending beyond the domain of the social sciences, which identifies the potential benefits of early childhood education and care. This literature has pointed to a range of benefits at the individual and societal levels, from improved educational attainment and labour market outcomes to lower crime, fewer social and educational interventions, and more cohesive and inclusive societies. For the purpose of this report, the potential benefits are grouped into the following categories: education and development; labour market; poverty, inequality, social cohesion and social inclusion; health and well-being; crime and justice and other effects. For each category, short- and long-run benefits are considered for both individuals and society. By shedding light on the benefits of ECEC, section 3 contributes to a better understanding of the reasons why it could be important to invest in it, and to the formulation of policy recommendations in this regard. Moreover, the section is closely linked to the following one, which assesses the conditions determining the extent to which the potential benefits of ECEC can be realised.

It is important to emphasise here that the literature base is especially large for the US, while fewer studies have focused on Europe. Nevertheless, to the extent possible, evidence will be presented for the EU Member States. Notably with regard to longitudinal evidence, the literature is especially rich for the US case. In a recent review of the literature, Van Belle (2016) suggests that to date most of the studies that focus on the European case only track individuals up to the age of 16, which implies that they specifically map educational outcomes. For other outcomes, like labour market outcomes or health outcomes, the age of 16 is too early to draw any conclusions. It is clear that longitudinal evidence is imperative to fully grasp the benefits resulting from early childhood education and care, precisely because many of these benefits only materialise later in life. Tracking individuals over a sufficiently long period of time is, therefore, crucial. Along the same lines, gaining insight into the societal impact of ECEC requires monitoring a range of variables, which by their very nature may already be difficult to capture or quantify, over a longer time period.

Another caveat that one has to bear in mind is that early childhood education and care has received less attention than other education levels in academic research in some of the disciplines relevant to this report. In other words, the evidence base for ECEC often is more limited than that of other education levels. For that reason, some general points will be explained on the basis of the broader literature, while fewer references can be given that are specific to the ECEC context. The literature on ECEC is embedded in this larger literature on education and builds on it, and at the same time the literature on education in general derives conclusions drawing on the insights of the ECEC literature.

3.1 Background

The economic benefits of education have been subject to research for many years. From the beginning, the relation between education and human capital, and their respective ties to economic performance and growth, have received much attention. Growth and productivity are closely tied to competitiveness, which is in turn linked to education too (Karoly et al., 2005).[5] Economic benefits at the societal level can be understood as the monetary benefits associated with investing in education, or in other words, they represent the financial returns from investing in ECEC. This distinguishes them from non-monetary effects, such as social cohesion (Wößmann and Schütz, 2006).

[5] Early work on human capital emphasises this link: in many countries, the quality and quantity of education and training have raised concerns over the past decades, in relation to the poor performance in productivity growth and competition faced by other players in the market (see Becker, 1994). Karoly et al. (2005) stress the effect on competitiveness: fuelled by technological change and globalisation, the demand for skilled labour has increased over the past decades. By investing in ECEC, and through its impacts on education and labour markets, countries can remain competitive in a globalised world.

Also the non-monetary benefits linked to education, and early childhood education and care, have been widely assessed. In fact, the initial debate on the importance of investing in ECEC was largely driven by non-economic arguments relating to child development (e.g. school readiness), inequality (e.g. ECEC as a lever for disadvantaged children to catch up), social cohesion (especially in contexts of increasing diversity) and integration (i.e. in contexts of the increased mobility of families and the integration of newcomers and refugees).[6] It is only since the early 2000s that ECEC has also been encouraged for economic reasons. Like the economic effects, non-economic benefits arise at the short and long run, and due to their nature, may be even more challenging to quantify than economic benefits. Moreover, such benefits accrue not only to the individual but also extend to society at large. As the potential economic and non-economic benefits of ECEC are strongly linked and therefore difficult to disentangle, both types of benefits will be considered simultaneously throughout this report.

In the debate on the benefits of education, the roles of both the *quantity* of education (i.e. the length of education, measured in terms of numbers of years of education) and the *quality* of education (measured in terms of expenditure, child-to-teacher ratios or teacher qualifications, among other indicators) have been studied. For example, there has been much research looking into the effect of adding an additional year of education on an individual's labour market returns. Similar exercises have focused on the difference in outcomes between individuals who completed secondary or tertiary education. For both the quantity and quality of education, a positive relationship with economic growth was detected.[7]

The research on the benefits of early childhood education and care is embedded in this work. Whereas initially most research focused on the returns of investment in education for older students, it was with Heckman's seminal work that returns to investment in education that early childhood education and care came to the forefront of the debate. This research, while founded on economic principles, also highlights important work in other disciplines such as neuroscience, psychology and sociology, in which there already was a much longer tradition of assessing early childhood and child development. One of the most important conclusions that emerges from the research on ECEC from the economic perspective is that the economics of ECEC presents yet an additional argument to encourage investment in it, along with the substantive body of work of other disciplines.[8]

In the remainder of this section, the focus is on the relationship between education and economic growth, human capital, labour market effects and other impacts. If necessary, first general principles or results are outlined and then their application to the context of early childhood education and care is presented.

Human capital theory and the returns on investment in education

One of the most studied relationships, also in the field of economics, is that between education and economic growth. In economics, investment in education is traditionally seen as an investment in 'human capital' and motivated by its contribution to economic growth (see e.g. Wößmann and Schütz, 2006; Gillies, 2015). Education can contribute to economic growth through several channels (Dickens et al., 2006; Wößmann and Schütz, 2006). In their work, Wößmann and Schütz (2006) refer to three mechanisms through which education promotes economic growth that have been identified in the literature. The first mechanism is *human capital (here, understood as skills)*: as Mankiw et al. (1992) explain, education increases the human capital endowment of the labour force, thus also raising productivity and output. A second mechanism builds on *innovation*: education stimulates innovation, which in turn promotes growth (see e.g. Romer, 1990). The third mechanism is *knowledge diffusion and*

[6] In September 2017, for instance, a consortium of European- and US-based foundations organised a high-level forum in Berlin with policy-makers on the role of ECEC for refugee children. See http://www.europe-kbf.eu/en/projects/early-childhood/transatlantic-forum-on-inclusive-early-years/tfiey-refugee-children-berlin.

[7] See e.g. Barro (1991), Mankiw et al. (1992), Temple (1999, 2001), Krueger and Lindahl (2001), de la Fuente and Domenech (2006), Vandenbussche et al. (2004) and Aghion et al. (2005); see Ciccone and Papaioannou (2005) regarding quantity and quality; see also e.g. Hanushek and Kimko (2000), Barro (2001), and Wößmann (2002).

[8] Heckman (2011) and Heckman and Mosso (2014), for example, show that investment in ECEC produces high economic returns, in particular for disadvantaged children, by boosting society's productivity.

transmission: education helps the understanding and dissemination of new information, which aids the implementation and use of new technologies (Nelson and Phelps, 1966). There are also externalities: for example, collaborating with workers who have higher education levels raises the productivity of workers with less education – though the evidence on these types of effects is mixed.

In the vast academic literature on education and economic growth, the need to have a highly skilled workforce is broadly acknowledged. The key question thus is how can it be achieved? To answer this question, one can fall back on human capital theory. Human capital theory has a long history in the economic discipline and is based on the notion that investment in education and training could build human capital along the lines of investment in physical capital (Mincer, 1958; Schultz, 1961). This also implies that returns on investment in education can be estimated. According to Becker (2002), human capital has developed into the most important form of capital in modern economics.

By investing in human capital, which involves direct and opportunity costs (i.e. financial resources and time, work experience), an individual becomes more productive and experiences benefits (in the short and long run) as a result. Benefits may not be limited to the individual alone, but also extend to society at large. The benefits of investing in human capital have been widely documented. Becker (1994), for example, established that in the US, high school and college education increment an individual's income, even when the direct and indirect costs of schooling, family background and abilities are taken into account. This result not only holds for the US, but also has been documented for numerous countries in different parts of the world.

The level of human capital that an individual attains is determined by several factors, such as innate ability, family characteristics (e.g. factors related to income or education), the cognitive and non-cognitive skills acquired and labour market conditions (Chevalier et al., 2006). Differences in the human capital levels of individuals can be explained by variations in these factors. This leaves policy-makers with a range of potential strategies, aiming at different factors, in an attempt to raise the level of human capital in the population.

Notwithstanding the multitude of potential policies, there is a growing understanding and evidence base suggesting that early childhood education and care plays a fundamental role in building human capital (Heckman, 2006; Esping-Andersen, 2008). In fact, recent research has suggested that investing in early childhood education and care is the most efficient form of government spending to increase human capital (Chevalier et al., 2006). For the case of the US, Heckman (2006) maintains that the economic return on investment per child is highest for ECEC – it is higher than the return on investment attained in any other period –the short-term costs associated with ECEC are more than offset by the short- and long-run benefits created by it.

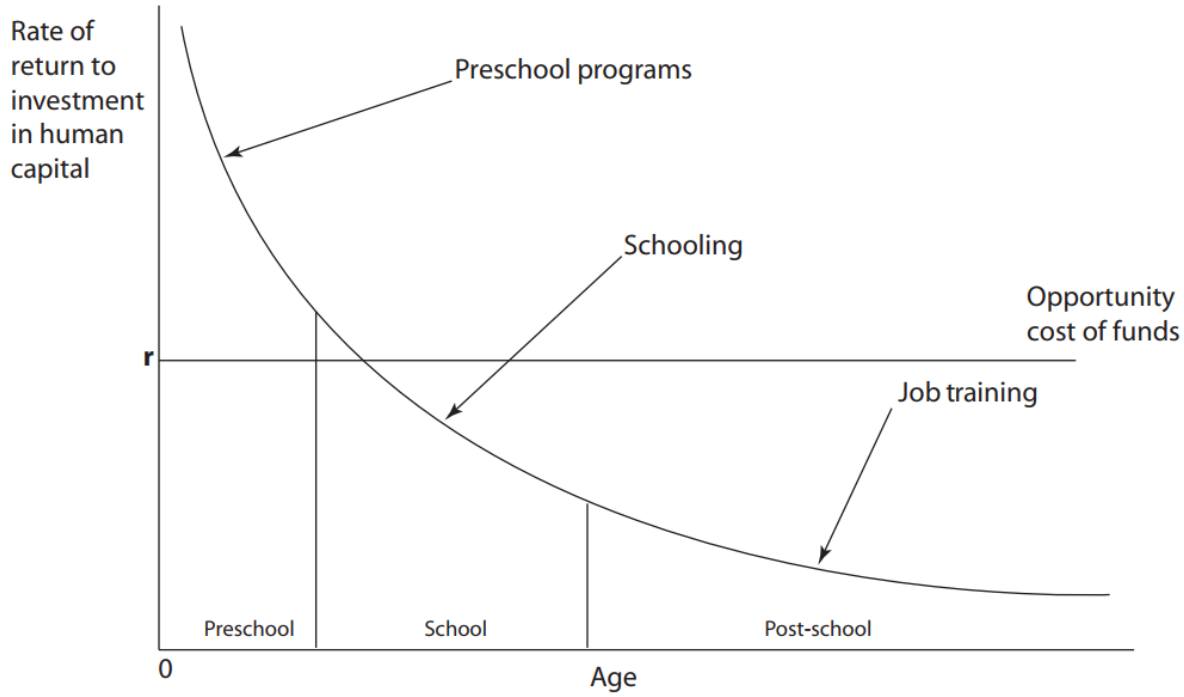
Heckman (2006) argues that the return on investment in the early years exceeds that of investment later in life because the development of a skill builds on skills acquired previously. Especially in the early years, skills are developed that are essential for further learning, such as perseverance or self-control. Such skills are important on their own as well as in supporting later education. In other words, certain developmental stages need to be reached in early childhood, and the competences acquired are a necessary foundation for later success (regardless of whether they are acquired). From an early age, both cognitive and non-cognitive abilities need to be developed to lay the foundation for future development. Or, as Heckman (2006) states, "[a] large body of research in social science, psychology and neuroscience shows that skill begets skill; that learning begets learning" (p. 2). Against this background, Carneiro and Heckman (2003) maintain that there is under-investment in the young, especially in disadvantaged populations, in the US. Also in Europe, disadvantaged children in particular remain underrepresented in ECEC (European Commission, 2016a).

The returns to investment in early childhood education and care are illustrated in Figure 8 and Figure 9. Figure 8 reveals that the returns to education are highest for investment in early childhood education and care, and decrease with age. Moreover, investment later in life is typically costlier. Kilburn and Karoly (2008, p. 5) confirm that "human capital theory suggests that investments in individuals'

productive capacities have the potential to improve individual outcomes and that these investments might produce the greatest payoffs when made early in individuals' lives".

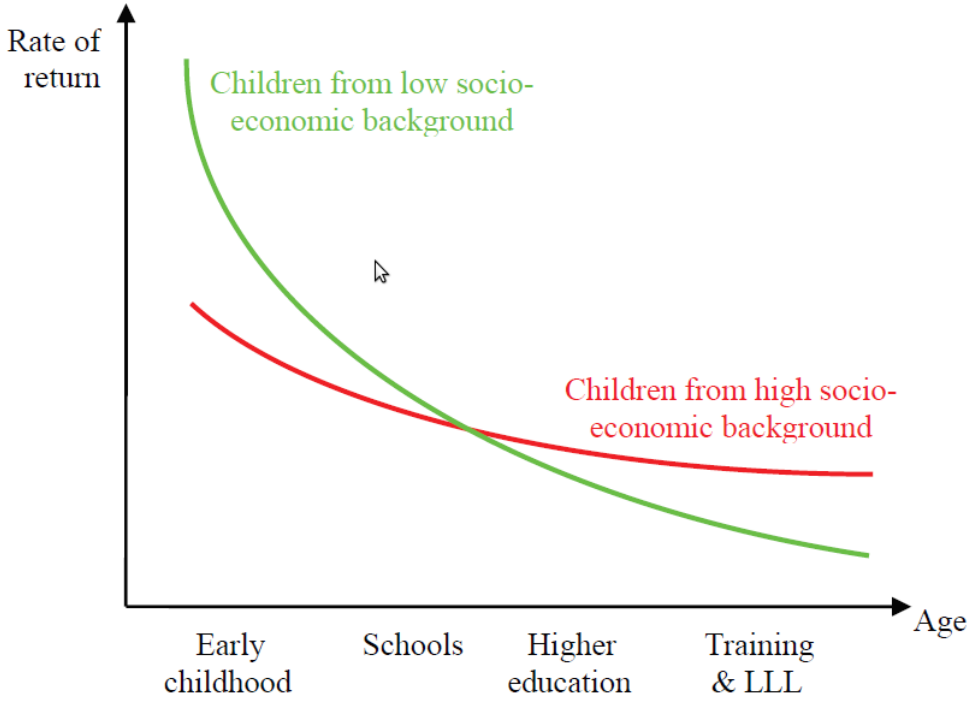
Figure 9 further shows that this holds particularly for disadvantaged children. For them, investment in high-quality ECEC is even more relevant, as their families have fewer resources to spend. This result can be explained as follows: though the optimal level of investment goes down with age for all children, more advantaged children receive major (limited) early investment from their parents (Becker, 1994). Becker (1994) explains that richer families are able to cover both the direct costs of education for their children, as well as costs associated with the earnings foregone when children are in education instead of at work. The situation for poorer families is rather different: poor families may be willing to lend money to their children to obtain further training, which should be repaid when they are older, but their children may not be able to do so.

Figure 8. Returns to education for all children



Source: Heckman and Masterov (2004).

Figure 9. Returns to education for children with different socio-economic backgrounds



Note: LLL refers to life-long learning.
Source: Wößmann and Schütz (2006).

Whereas this work highlights the important benefits of early intervention, this does not mean that later investment in education is superfluous (Heckman and Masterov, 2004). By contrast, there is a widely-supported consensus that later investment, for example in life-long learning, remains important to ensure that the steps taken in early childhood effectively translate into benefits in the long run. Currie and Thomas (2000) even conclude that the initial gains of investing in ECEC fade out if there is no subsequent investment later in life. The rate at which the benefits from investing in ECEC disappear, however, differs across ethnic groups. Currie and Thomas (2000) report that the fadeout rate for black students surpasses that of white students, a result that can be attributed to differences in the quality of the schools to which the students pass on. Whereas white students continue their education in schools of an average quality, black students tend to pass on to schools of low quality (reflected in having test scores as much as one standard deviation below the average). Research further suggests that returns on investment in education later in life are higher for those who participated in ECEC (Heckman and Masterov, 2004). This argument is supported by other work, such as that by Cunha et al. (2006), which shows that later interventions are much more expensive. From this body of research, one can derive that investment in ECEC and other forms of education can be considered complimentary and should, therefore, go hand in hand (Heckman and Masterov, 2004).

Monetising benefits and cost–benefit analysis

Other work has further analysed the return on investment in early childhood education and care. Some studies have even carried out cost–benefit analyses of investing in early childhood education and care. Monetising the benefits of such education and care, however, is a challenging task, for several reasons. One reason is that many of the benefits of ECEC only materialise in the long run or do so as externalities to others (e.g. children of more highly educated mothers grow up in more advantageous circumstances – see the section on other beneficiaries and spillover effects (section 3.7.2) below). Such methodological issues are tackled in Box 1 (which can be found on the following page). Here, the aim is to review the approaches used in existing cost–benefit analyses of investment in early childhood education and care.

Cost–benefit analyses aim to quantify the benefits and costs associated with a programme or measure in order to arrive at a conclusion on whether it is cost-effective by comparing the present value total costs and total benefits (Karoly et al., 2005). On the benefit side, the effect of the programme or measure (in comparison with a baseline, e.g. a comparison group to which the programme or measure is not applied) is assessed on the basis of the dollar value resulting from the change in the outcome. On the cost side, the dollar value of the costs associated with the measure or programme are used (e.g. infrastructure or staff). To arrive at the present value of total costs and benefits, dollar values need to be discounted at a constant annual rate to a common point in time, as costs and benefits may arise at different points in time. Karoly et al. (2001) suggest using discount rates of 3%-6% for each year, as is common in cost–benefit analyses of social policy. Cost–benefit analyses can be performed from the perspective of society as a whole or for specific actors, such as individuals.

In the context of early childhood education and care, generally, the costs associated with a programme or measure are easier to quantify than the benefits it generates. There are several reasons why this is the case. First, many benefits related to ECEC only materialise in the long run. This implies that if the cost–benefit exercise is carried out too early, not all benefits may be accounted for. Therefore, the age of the follow-up is a major factor to take into account. Second, the benefits associated with ECEC are often intangible in nature (e.g. improved social cohesion).[9] Third, the benefits of ECEC typically have a wide outreach, affecting children, their parents and their descendants, in addition to the government and society at large. This observation explains why it is particularly difficult to capture all the benefits in the cost–benefit model. A closely related point is that the ECEC benefits accrue to a range of areas, like labour markets, health and others, and in that way give rise to a complicated set of effects to take up in the analysis. Moreover, distributional effects (e.g. which private or public actors receive the benefits) are not necessarily considered. For these reasons, estimates of the benefits are likely to be conservative (i.e. underestimations), meaning that the actual net benefit would be larger than expected.

[9] Wolfe and Haveman (2002) devote some discussion to how the value of the non-market impact of education can be estimated (both private and public). For private non-market components, a traditional household production function links education and market inputs to non-market outcomes (see also Haveman and Wolfe, 1984). From this, the marginal value of additional schooling in the production of the non-market outcomes can be estimated. Wolfe and Haveman (2002), acknowledging that their method needs further development, present some estimates reported in the literature (e.g. a value of $350 in family income for a high school diploma versus no diploma (Angrist and Lavy, 1996)).

Box 1. Methodological issues related to the quantification of benefits from early childhood education and care

When it comes to the economic benefits of education in general, and of early childhood education and care more specifically, there are several methodological issues that complicate the analysis (Reynolds et al., 2011). Although the potential economic benefits of ECEC have been described in a number of academic and policy-oriented studies and are theoretically well-established, such benefits are difficult to quantify empirically. This implies that one has to be cautious when deriving conclusions and with generalisations (Reynolds et al., 2011).

A first factor that complicates quantification is that many benefits related to investment in ECEC only unfold in the *long run*. The labour market effects of participation in early childhood education and care, for example, are only revealed when a child reaches adulthood. Also for health-related impacts, for example, it can take a very long time before they materialise. This delay makes it difficult to connect results to potential drivers and identify causal relationships between ECEC and the outcome of interest (especially considering the many other factors that may also influence the relationship found). Yet, identifying causal relationships is essential to arrive at suitable policy recommendations. The research design of studies looking into the benefits of ECEC, therefore, has to be considered with great care. Moreover, Karoly et al. (2005), Temple and Reynolds (2007) and Reynolds et al. (2011) argue that evidence of long-term effects is often based on rather small samples of participants and analyse efficiency, rather than effectiveness.

In this regard, it is important to recall the *limitations of existing research*, which is typically concentrated on small-scale programmes or measures targeting a specific group of disadvantaged children (Karoly et al., 2005). The beneficial impact of ECEC has not been demonstrated in all studies. The study by Caillé (2001) in France compared the later school careers of children who attended preschool at age 2 with those who enrolled only at age 3. When controlling for socio-economic status, he did not find any significant results. Recently, Fukkink et al. (2015) conducted a meta-analysis of 15 years of preschool programmes for vulnerable children in the Netherlands and concluded that the impact was below expectations and in most cases insignificant. This leads researchers to conclude that certain conditions need to be met before beneficial results can be obtained.

A further consideration relates to the *non-economic aspects* of ECEC, which need to be accounted for and may affect the economic benefits. For this reason, analyses of the economic side of education often draw on research from other social sciences, using a multidisciplinary approach.[*] To this end, the present report devotes attention to both the economic and non-economic effects of ECEC, and to different types of factors that may influence their realisation.

[*] See Wößmann and Schütz (2006) who make a similar argument in their assessment of the efficiency and equity of education and training systems.

Generally, the benefits of investing in ECEC are found to be considerably larger than the costs associated with it. The Irish National Economic and Social Forum, for example, concluded in a report prepared in 2005 that the long-term societal benefits of a state-funded universal ECEC system would be seven times larger than the associated costs (or four times when more conservative estimations were made). These results were achieved when controlling for educational outcomes, labour market earnings and taxation, the justice system and the value of childcare for families (NESF, 2005). From their review of the literature covering a range of US-based programmes, Karoly et al. (2005) derive that benefits of early childhood education and care programmes exceed the costs associated with them.

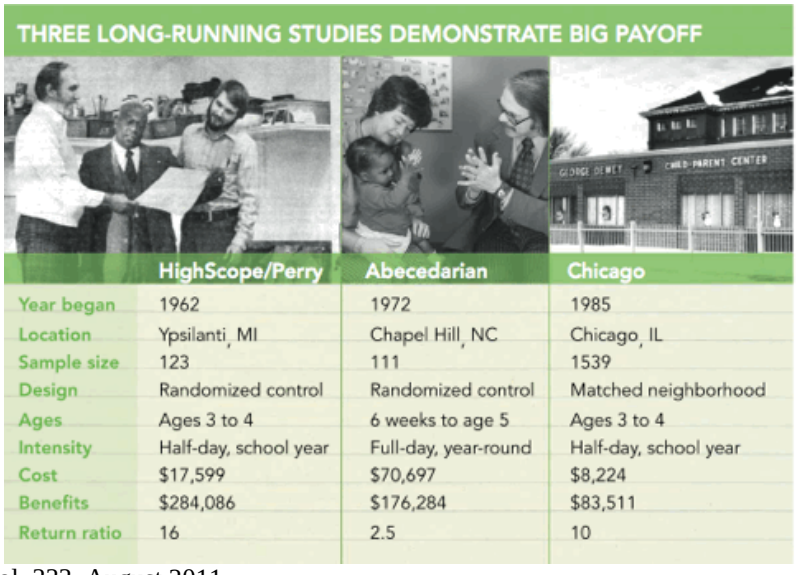
Long-run evidence on the costs and benefits associated with early childhood education and care

The most-cited evidence on the costs and benefits tied to investment in early childhood education and care comes from a series of longitudinal studies on programmes or measures introduced in the US. The costs and benefits of these programmes have been the subject of a number of studies, each looking into diverse aspects or taking different approaches to evaluate the programme (e.g. in terms of the age at which individual benefits are measured). In many cases, both economic and non-economic potential benefits are considered. While some studies have focused explicitly on the benefits and costs in one specific domain (e.g. education), others have taken a broader approach (e.g. covering education, labour and crime). This complicates potential comparisons of ECEC programmes. Moreover, the design of different programmes, both within and across countries, may vary considerably (in terms of programme scope, eligibility, duration, etc.) and also the institutional context comes into play. With this in mind, evidence for different types of ECEC programmes that ran in different parts of Europe is presented below.

Prior to delving into the European context, several well-known American programmes and studies are documented, which inspired research and interest into early childhood education and care. The oldest longitudinal studies on early childhood education and care include the HighScope Perry Preschool project (1962), the Abecedarian project (1972) and the Chicago preschool project (1985) as depicted in Figure 10.

A comparison between the US[10] and EU context, however, has to be carried out with some caution (as emphasised by Van Belle, 2016). First of all, the most examined American programmes targeted disadvantage communities (small groups), ran many years ago, and were launched under very different institutional, economic and societal circumstances from those found in Europe today. Also the targeting of children and even the patterns of disadvantage and inequality diverge. In addition to this, crime rates, labour market conditions and social security schemes are similarly closely linked to the national and institutional context. All these caveats are important to take into consideration, as they affect the extent to which the results for the US have external validity for the European context. That being said, the limited evidence that does exist for the European context points to similar effects as the American examples. For that reason, this report starts from the much-discussed US cases and then continues with more recent European-focused research.

Figure 10. Costs and benefits associated with three major programmes for early childhood education and care in the US



	HighScope/Perry	Abecedarian	Chicago
Year began	1962	1972	1985
Location	Ypsilanti, MI	Chapel Hill, NC	Chicago, IL
Sample size	123	111	1539
Design	Randomized control	Randomized control	Matched neighborhood
Ages	Ages 3 to 4	6 weeks to age 5	Ages 3 to 4
Intensity	Half-day, school year	Full-day, year-round	Half-day, school year
Cost	$17,599	$70,697	$8,224
Benefits	$284,086	$176,284	$83,511
Return ratio	16	2.5	10

Source: *Science*, Vol. 333, August 2011.

[10] The US studies do, however, have strong internal validity as they are based on randomised control trials.

The former two studies presented in Figure 10, i.e. the HighScope Perry Preschool project and the Abecedarian project, are 'randomised controlled trials', meaning that underprivileged children were permitted access to high-quality services, while other (and equally underprivileged) children were denied access. Both groups of children were followed over a number of years,[11] and their outcomes were compared. Group assignment was random, which implies that a comparison of outcomes is close to casual. Children with similar characteristics are compared, so that one can separate the impact of participation in ECEC from impacts stemming from other factors, such as family background.

Today these children are adults and follow-up studies are still going on, demonstrating that those who were enrolled in the programmes show better health, better employment, less welfare dependency, less delinquency and better well-being than their peers who were not enrolled in ECEC (Barnett, 2011; Barnett amd Masse, 2007; Heckman, 2006). This has given rise to the much-cited conclusion that investment in ECEC yields high economic returns (Eurochild, 2015). However, in order to attain these results, the quality of the ECEC programme is crucially important. García et al. (2017), for example, suggest that participation in low-quality ECEC provision is harmful for boys, but not for girls, whereas participation in high-quality ECEC provision is beneficial for both boys and girls (this result may explain other research that has challenged the notion that participation in ECEC is beneficial by default). In the following subsections, more details on the different impacts associated with participation in ECEC are provided.

The latter study, on participation in the Chicago Child-Parent Centre (CPC), presents an example of a *matching* exercise.[12] This programme has been examined by many, for example by Reynolds et al. (2011), who assess the effects of participation on individuals' well-being at the age of 28. CPC is a federally funded programme that offers educational and family support services to economically disadvantaged families. More specifically, it focuses on basic language and maths skills. CPC classes are organised in small groups and led by certified teachers who are assisted by aides. Parents are actively involved.

Data on participation in the programme are available from the Chicago Longitudinal Study, which provides information on 1,539 families of whom most participated in the CPC programme. Of these families, 93% are African American. In the database, there are 989 children who attended preschool and kindergarten in a CPC and 550 low-income children who only attended kindergarten in five randomly selected schools (not CPC). Matching was based on age, eligibility for intervention and family poverty. Using these data, Reynolds et al. (2011) show that children who participated in ECEC had significantly higher levels of educational attainment, such as the highest grade completed and college attendance. These educational outcomes also resulted in an improved economic status, measured by occupational prestige, annual income and socio-economic status. There was no statistically significant impact on degree completion or employment.

Since these early studies for the US, European studies have confirmed positive individual benefits of attending high-quality ECEC in the domains of cognitive development, socio-emotional development and school career for all children (Burger, 2010) and for disadvantaged children in particular (Lazzari and Vandenbroeck, 2012). We first comment on some examples of studies that document cognitive as well as non-cognitive outcomes and academic success. We then turn to a specific study, conducted in England, for it is probably the most up-to-date and one of the most comprehensive studies in this field today.

[11] The number of years depends on the specific study under consideration.

[12] Melhuish et al. (2006) briefly discuss the differences between the aforementioned methodologies. These authors find that randomised controlled trials have a significant internal validity, which is an important strength. On the other hand, longitudinal cohort studies are interesting as their results can be generalised and such studies can be applied to different types of ECEC provision.

The first major longitudinal studies in Europe were probably conducted in Sweden, first by Andersson (1992). In their work, a group of 128 children was studied, ranging from 16 months to 13 years old. The study concluded that childcare enrolment before age 1 was associated with better scores on cognitive tests at age 13. Age of entry was a significant predictor of cognitive results, even when controlled for family characteristics (including family type, family socio-economic status and the mother's education level). The authors attributed the positive effects to the high quality of the Swedish childcare system, including well-trained staff. The Anderson study was soon followed by that of Broberg et al. (1997), tracking 146 children up to age 8 and comparing children who attended centre-based care with children who attended family-based care or no care. They confirmed that an early start matters, as the number of months in childcare was positively associated with cognitive outcomes (controlled for background variables). These authors also confirmed that process quality (i.e. adult–child interactions) as well as structural quality (i.e. group size and child–staff ratio) predicted mathematic skills at age 8.

In Northern Ireland, the team of the EPPNI study (Melhuish et al., 2006) looked longitudinally at a sample of 800 children, recruited at age 3+ and studied at ages 3, 4, 5, 6, 7 and 8. They concluded that preschool enhances cognitive development (but also social development and behavioural competences), that higher-quality preschool is associated with better intellectual outcomes and that – in turn – high quality is the product of high-quality staff, professional development, strong leadership and a strong and shared curriculum. This is particularly the case for vulnerable children, according to the Northern Irish study.

The 1975 childcare reform in Norway was used to study the impact of childcare availability on children's educational attainment by Havnes and Mogstad (2011). Three cohorts (before, during and after the reform) were compared at age 30 to 33. The study concluded that childcare attendance was significantly associated with educational attainment in the long term. Again, subsample analyses indicated the largest effects on attainment for children whose mothers had low levels of education.

Similarly, Felfe and Lalive (2011) conducted a longitudinal study on a national dataset of (former) East and West Germany, looking at data from 800 children, studied from ages 2 to 10. Similar to the Northern Irish study, Felfe and Lalive (2011) found that children who attended ECEC centres achieved significantly higher scores on all cognitive and non-cognitive indicators. Children from a lower socio-economic status benefitted more when accessibility to ECEC centres was improved. A few years earlier, Spieß et al. (2003) analysed data from the German Socio-Economic Panel to look at effects of ECEC use in West Germany. They analysed the school careers of a sample of 110 migrant children and 206 German children. The main finding was that kindergarten attendance significantly raised the probability of immigrant children being placed in a school with a higher educational level. This was not the case for German-born children, after controlling for socio-economic status. Becker and Tremel (2006) reported similar results in their study using data from the same panel.

Van Huizen et al. (2016) focus on the case of Spain, using the expansion of the LOGSE (Ley Orgánica de Ordenación General del Sistema Educativo) reform as an example. The LOGSE reform expanded the eligibility of preschool services to children aged 3 (whereas before, only those aged 4 and 5 were eligible). These authors examine the link between this reform and the employment of mothers and child development.[13] The total costs per child in ECEC are estimated at around €3,500. The benefits for children (at age 21) included earnings amounting to €330 due to reduced grade retention, and earnings resulting from improved wages (€6,700) and employment (€2,900). The total benefits for children amounted to close to €10,000 in the study.

An Italian study by Brilli et al. (2011) equally looked at enhanced accessibility of childcare (0 to 3 years) and its impact on scholastic achievements, in the Italian context of limited access and availability. A national sample of children at age 7 was studied, using statistical regression analysis of survey data and econometric methodologies. The study confirmed that an increased accessibility for vulnerable children

[13] For data availability reasons, all estimates are expressed in 1997 euros, and present values are obtained by applying a discount rate of 3% (van Huizen et al., 2016).

(i.e. by childcare rationing) had positive effects and that the impact is highest for children with mothers who had the lowest formal educational levels. In addition, the study by Del Boca and Pasqua (2010) analysed data on 1,000 Italian primary school children and found that childcare attendance (between 0 and 3 years) had a significant positive impact on all non-cognitive indicators.

Lanfranchi (2002) and Lanfranchi et al. (2003) looked at the impact of ECEC on migrant children with Albanian, Turkish, Portuguese and Italian backgrounds, as well as Swiss backgrounds, using questionnaires for teachers. The main findings of these studies indicated that children who attended ECEC were significantly better assessed by their kindergarten and primary school teachers in the first class in terms of their linguistic, cognitive and special skills than children who grew up exclusively in the circle of their own family; in particular, it emerged that children from migrant families managed the transition to school significantly better.

Despite this wealth of evidence, not all studies find strong correlations between ECEC and children's outcomes. A cohort study in the Netherlands by Driessen (2004) collected data in kindergarten and at grade 2 and grade 4, and compared these with a sample of children who did not take up ECEC. Driessen (2004) found only weak correlations that disappeared when controlling for family characteristics. Similarly, Veen et al. (2000; 2002) evaluated Kaleidoscoop and Piramide, two programmes in Dutch kindergarten, aimed at vulnerable children. They used a non-randomised controlled trial and also found inconsistent results (while some experimental groups outperformed the control groups on language, this was not systematically the case and no significant longer-term results were found on other cognitive and non-cognitive variables). However, as Driessen (2004) stated, the findings may not be relevant outside the Netherlands, considering the very diverse and highly fragmented organisation of childcare in that country.

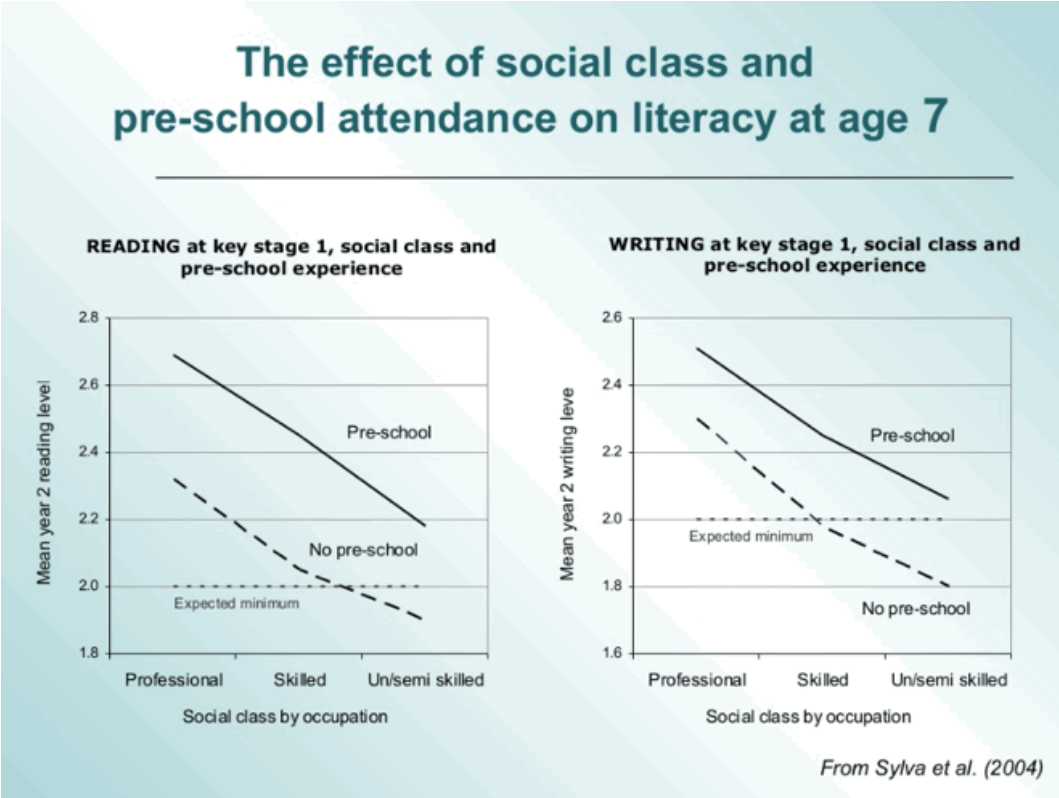
In Denmark, Datta Gupta and Simonson (2007) conducted a pseudo-experimental cohort study through a statistical estimation on a large-scale dataset (the Danish Longitudinal Survey of Children) of 6,000 children. The focus was on non-cognitive outcomes, as previous studies had suggested that children in childcare more frequently presented behavioural problems. The study concluded that day care had no significant non-cognitive effects at age 7, except when taken up for more than 40 to 50 hours per week.

Also, a French study by Caillé (2001) compared the school careers of children who had attended kindergarten at age 2 with those who had entered at age 3. The positive effect of an early entry did not persist when controlled for family characteristics, meaning that it was family background rather than early entry in ECEC, that explained the differences in school career.

Probably the most-renowned European study is the UK's Effective Preschool Primary and Secondary Education Project (EPPSE), following a cohort of around 3,000 children who were aged 3 in 1997 (see Sylva et al., 2004 and Sammons et al., 2012). As illustrated in Figure 11, Sylva et al. (2004) found beneficial effects of high-quality preschools at the entry of primary school and at age 11 for language and mathematics, but also for prosocial behaviour. The graph shows that these beneficial effects are to be found for all children, but they do not diminish the gap between higher and lower social statuses (National Council for Curriculum and Assessment, 2009). However, it also indicates that children from lower socio-economic statuses who attended high-quality preschool score above what primary school teachers estimate to be the minimum level to be successful in school, while children from lower socio-economic statuses who did not attend ECEC did not reach the same level. In contrast, all children with higher socio-economic statuses attain the minimal level, regardless of their attendance of preschool. In sum, while high-quality preschool does not necessarily close the gap, it does make a salient difference, particularly for children from lower social statuses.

The impact seems to be less clear at age 14, but appears to become more visible again at age 16, for both mathematics and language skills. That is the case even when children attended a primary school of moderate quality. Moreover, the impact is larger when children attended preschool for more years, as the number of years seems to matter more than whether the child attended part-time or full-time.

Figure 11. Effects of social class and participation in early childhood education and care on literacy at age 7



Source: Sylva et al. (2004).

In the remaining sections, further results on specific benefits – such as those related to educational attainment or labour market status – are presented. When reviewing potential benefits, it is important to bear in mind that the evidence on many of them is still rather limited, especially for long-run effects and the European case.

3.2 Education and development

3.2.1 Individual benefits

There is an abundance of robust evidence, often from longitudinal research, on the beneficial impact of early childhood education and care on the cognitive, emotional and social development of children, as well as on their later school career. Learning and education, indeed, do not start when a child enrols in compulsory education – but much sooner (European Commission, 2014). Carneiro and Heckman (2003) and Heckman and Masterov (2004) confirm that skill gaps emerge before compulsory schooling. Early childhood education and care also introduces young children to organised instruction outside the family context.

In this section, the focus is on cognitive and non-cognitive skills and education. Cognitive development is often measured on the basis of IQ and achievement tests (Carneiro and Heckman, 2003). IQ is used as an indicator of intellectual capacity, while achievement tests capture knowledge in specific domains. Non-cognitive skills and child development, in turn, are often assessed in terms of emotional and social skills. Non-cognitive skills and well-being are captured with a range of measures, such as positive sense of self or security (Van Belle, 2016).

Children who attend ECEC are found to have higher educational attainment than those who did not (Barnett, 2011; Barnett and Masse, 2007; Heckman, 2006). Children who participate in early childhood

education and care generally perform better in school (in terms of test scores for numeracy and literacy and grade retention rates) and have higher rates of school completion (and higher rates of college attendance). In a report prepared for the World Bank, Fasih (2008) confirms that early investment in education generates high returns and lowers the costs of educational investment at a later stage by making learning at later ages more efficient. Mitchell et al. (2008), building on results from Karoly et al. (2001) and Reynolds et al. (2002), report that the HighScope Perry programme is associated with less time spent in special education at age 19 (16% of the time for ECEC participants versus 28% of the time for others), fewer years spent in special education at age 27 (1.1 versus 2.8), higher rates of high school completion (49% versus 39% by age 21), higher rates of high school graduation (66% versus 45% at age 27), and more post-secondary education (33% versus 28%). For the Chicago CPC, the authors report lower participation in special education at age 9 for ECEC participants than for non-ECEC participants (8% versus 9%), fewer years in special education (at age 14, 0.6 versus 0.9; at age 18, 0.7 versus 1.5) and higher rates of high school completion (50% versus 39%). Finally, for the Abecedarian programme, the following results were obtained: fewer years retained in grade by age 15 (31% versus 55%), less participation in special education by grade 9 (age 14) (25% versus 48%), higher rates of high school completion (67% versus 51%) and higher rates of college enrolment by age 21 (36% versus 13%).

When it comes to cognitive skills, it is crucial to note the important debate on the testing of very young children. Over the few last years, the debate on testing children at the preschool age has gained momentum. One of the causes of the growing debate is the recent OECD initiative of the International Early Learning Study (IELS),[14] aimed at measuring child development at age 5 in a PISA-kind of way. In 2016 a group of leading early childhood researchers published a severe critique of the initiative (Moss et al., 2016) and this was soon followed by a statement signed by more than a hundred scholars worldwide.[15] There are indeed serious methodological problems of validity (and especially predictive validity) of preschool testing. In an earlier literature review on monitoring, OECD was very cautious not to advocate children's testing as a way of monitoring the quality of ECEC (Litjens, 2014). The criticisms, however, go further than methodological scepticism as they also find fault with the way global testing risks entailing a standardisation and narrow focus on outcomes that are measurable, without democratic debate on the relevance of these outcomes. Articles pleading against participating in the global measurement trends have been published in Belgium, Canada, France, Germany and the UK, and in a number of these countries this has influenced governments not to participate in the IELS study (Moss and Urban, 2017).

Next to its impact on educational attainment and cognitive development, participation in early childhood education and care is also found to enhance children's emotional, behavioural and social development. These non-cognitive skills and competences are not necessarily reflected in a child's educational attainment or their academic achievements, given that the current approach towards testing in schools is entirely based on cognitive skills and performance. Notwithstanding these considerations, it is widely recognised that non-cognitive skills and competences are essential to an individual's further development, not least because of their contribution to learning in school and outside it – which is then translated into improved labour market outcomes (Carneiro and Heckman, 2003). To this end, the combination of education and care that is found in most ECEC settings in Europe is imperative, given that especially young children learn and develop through playing (Smith and Pellegrini, 2013).

Similar to the findings for cognitive skills, non-cognitive skills cannot be seen separately from other factors shaping child development. Family background again proves to be the main determinant, i.e. academic research suggests that children from disadvantaged backgrounds have less developed social and emotional skills than their counterparts (Chevalier et al., 2006; Guerin, 2014).

3.2.2 Societal benefits

[14] See http://www.oecd.org/edu/school/international-early-learning-and-child-well-being-study.htm.

[15] See http://www.receinternational.org/RECE-comment-on-OECD-ICCPS.html#sthash.esLaPAnJ.dpbs.

At the societal level, the economic benefits of early childhood education and care generally take the form of reduced spending or increased revenues in specific policy domains, such as social security or taxation (Karoly et al., 2005). In this way, these public benefits are closely connected to the outcomes identified at the individual level.

Lynch (2004) models the budgetary impact of setting up a government-financed, permanent, high-quality early childhood programme in 2005 that would target 20% of all children aged 3 and 4 – most of them living in poverty. Whereas initially the costs associated with the programme exceed the benefits arising from it, the reverse situation occurs towards the end of the period considered (2050). By 2021, the benefits would surpass the costs. The model further shows that by 2050 the estimated benefits would equal 0.44% of GDP and estimated costs would equal 0.2% of GDP in the US. Nevertheless, also in this section it is important to reiterate that quantifications of these benefits are not readily available, for the reasons mentioned above.

Van Huizen et al. (2016), in contrast, do present evidence on both the costs and benefits associated with extending ECEC to children aged 3 in Spain. These authors report that the total benefits associated with this change amounted to over €15,000, while total costs stood at €3,500 (per child, in 1997 euros). Considering that in that year over 1,540,000 children aged 3 were enrolled in ECEC, the total net impact would equal about 0.35% of GDP (€2.35 billion minus €546 million). Moreover, the authors further show that the children themselves are the main recipients of these benefits, which is driven by the effect on their earnings resulting from reduced grade retention and improved skills. The benefits for parents amounted to €2,787 (due to the overall higher earnings of mothers). The societal benefits emerging from the reduced grade retention stood at €330 and increased taxation (by about €2,200).

With regard to education, public expenditure on education is likely to decrease because fewer students repeat grades, are enrolled in special education, need additional lessons or training, or drop out of high school altogether (as illustrated by Lynch, 2004; Karoly et al., 2005; van Huizen et al., 2016). These advantages do have to be weighed against the costs of the ECEC provision and programmes, as well as the fact that expenditure may go up in tertiary education (which generally is more expensive than education at lower levels) due to higher participation rates (ibid.). Nevertheless, there is ample research suggesting that the benefits surpass the costs, even by a wide extent (as is documented in previous sections, such as those reporting on the cost–benefit analyses and the longitudinal evidence presented).

3.3 Labour market

3.3.1 Individual benefits[16]

Labour market effects for those who participated as children

Besides educational outcomes, potential labour market outcomes have received much attention in the research on early childhood education and care. There are numerous studies showing that those who participated in ECEC have more favourable labour market outcomes than those who did not (Karoly et al., 2005; Heckman, 2006; Barnett and Masse, 2007; Barnett, 2011). Examples include labour market participation, earnings, productivity, employability and employment opportunities (Shomos, 2010; Van Belle, 2016). ECEC can foster individual productivity, especially that of children in poverty or other adverse circumstances (Heckman and Masterov, 2004). Several studies for the US and EU have detected

[16] Education and labour market outcomes are inseparable (Card, 1999; Harmon et al., 2001; Harmon et al., 2003). As early childhood education and care lays the foundation for learning and development later in life, it will also make a major contribution to the impact of education on labour outcomes. Finally, there is also evidence linking decisions on expenditure and savings to the education level of an individual (Bernheim and Scholz, 1993). Individuals with higher educational attainment are found to have higher saving rates (Solomon, 1975). Bernheim and Scholz (1993), for example, find that especially Americans with no college education save too little, in the context of taxation, income and pensions.

significant and lasting effects of ECEC participation on both educational attainment and wages.[17] Dumas and Lefranc (2010), for example, start from a policy change in France in the 1960s, which increased participation in ECEC from 35 to 90%. These authors show that an additional year of ECEC attendance raises average earnings by 3% and lowered the dropout rate by 2%.

In part, the above results can be explained through improved education: because individuals who attended ECEC generally have higher educational attainment than those who did not, they also have better chances in the labour market. For example, they are able to obtain better-paid jobs and are more likely to be employed (Wößmann and Schütz, 2006). Education raises an individual's productivity and cognitive abilities, which is rewarded with higher wages and better non-wage remuneration (such as fringe benefits and better working conditions) in the labour market (Duncan, 1976; Lucas, 1977; Neal and Johnson, 1996; Currie and Thomas, 2001). A few studies suggest that the costs of job search are lower and that mobility goes up with education (e.g. Greenwood, 1975). Unemployment rates, likewise, are also lower for more highly educated people, making them less dependent on welfare benefits or other benefits (Rudd et al., 1990; Wolfe and Haveman, 2002). Moreover, better-educated individuals are not only less likely to be eligible for welfare transfers, they are also less likely to take up transfers even if they are eligible to receive them (Kiefer, 1985; An et al., 1993). Note that an individual's ability also has an impact on wages independently of education (Carneiro et al., 2005).

While the literature has clearly demonstrated a positive relationship between participation in ECEC and labour market outcomes later in life, the quantification of these effects is not straightforward. Or, as Card and Krueger (1992), put it, "it is easier to predict future test scores given past test scores, than to predict schooling attainments or labour market outcomes" (Currie and Thomas, 2001, p. 25).

Labour market effects for parents

Besides the potential labour market benefits for the children participating in early childhood education and care, there are also important benefits for their parents. In fact, one of the most frequently cited reasons to encourage investment in ECEC is its impact on the labour market participation of parents, and of mothers in particular (see Kimmel, 1998; Karoly et al., 2005; Meulders et al., 2009; OECD, 2017). The upsurge in women's labour market participation since the 1960s has been documented by many studies. In many European countries, both parents are active in the labour market nowadays. As a result, the demand for childcare has increased tremendously. This, however, also implies that a lack of accessible, affordable and high-quality ECEC may impose barriers to labour market participation. Moreover, it could also affect parents' work–life balance.

Research on the employment behaviour of parents in relation to ECEC has concentrated on the role of mothers, as women are still the primary caregivers in many families (Kimmel, 1998). It can, therefore, be expected that the conditions under which ECEC is organised have an impact on the labour market participation of women especially. Mothers are likely to reduce working time (e.g. work part-time instead of full-time) or drop out of the labour market altogether, particularly when their children are still young, if ECEC provision is unavailable or expensive (Meulders et al., 2009). PwC (2014) model the labour market impacts on children, parents and society of a 5% reduction in the cost of childcare for the case of Australia. The report shows that the labour force is expected to grow by 15,000 to 25,000 individuals due to this policy change (these estimates capture both the increased labour market participation of women and that of their children). Estimates for productivity effects are less clear and seem to depend on the size of the productivity increase assumed in the model.

Kimmel (1998) finds that the costs of childcare have a significant and negative impact on the labour market participation of married women. For single mothers, the estimation results were less robust. Focusing on married women only, Connelly (1992) reaches a similar conclusion. Other work, like that by Blau (2001), maintains that labour force participation goes up as ECEC costs decline and that this

[17] See e.g. Bauer and Riphahn (2009), Dumas and Lefranc (2010), and Havnes and Mogstad (2011), in addition to the examples listed above.

effect holds especially for single mothers and mothers with low incomes. Regardless of which group sees the biggest effect, these results present an argument in favour of childcare subsidies, to push down the cost. Yet, other studies have found smaller effects (e.g. Jongen, 2010, for women's labour market participation in the Netherlands). A more recent meta-analysis by Akgündüz and Plantenga (2011) arrives at the following result: there is a consensus that there is a negative relationship between the cost of ECEC and labour market participation; the size of the elasticities depends on the country's labour force participation rate, part-time work and social spending.

In the most recent edition of the OECD's *Starting Strong* series, further data on the relationship between ECEC enrolment rates in formal childcare and the labour market participation of mothers are presented. The numbers confirm a positive impact of ECEC on the labour market participation of mothers, especially for those whose youngest child is less than 3 years old. In some countries, like Denmark and the Netherlands, both enrolment rates and labour force participation are high. In other countries, such as the Czech Republic and Slovakia, the opposite results were found. In 2014, on average across the OECD, 35% of women with a child younger than 3 were employed. This number increases to 65% for those with children aged 3 to 5. However, besides considering the cost of ECEC, the quality needs to be ensured as well in order to encourage trust and confidence in the system (OECD, 2017). Karoly et al. (2005) similarly report that the stability and quality of ECEC can influence labour market participation and performance.

In addition to its effect on labour market participation, the availability of high-quality ECEC also has an impact on parents' labour market performance. MacGillvary and Lucia (2011), for example, report that the availability of reliable, high-quality ECEC provision reduces absenteeism and employee turnover, and enhances productivity. Karoly and Bigelow (2005) also find evidence of these effects. Finally, positive effects are also detected for parents who are themselves still studying: the availability of ECEC provision enables parents to pursue their education.

Meulders et al. (2009) differentiate between mothers and fathers when describing labour market effects related to ECEC. Although there is substantial variation, these authors find that employment gaps between mothers and non-mothers are typically larger than those between fathers and non-fathers. Moreover, there is a wage gap between mothers and non-mothers.

3.3.2 Societal benefits

Early childhood education and care has been related to higher tax returns, which are due to the increased earnings and higher labour market participation that result from ECEC attendance (Karoly et al., 2005; Wößmann and Schütz, 2006; Van Belle, 2016, van Huizen et al., 2016). Higher incomes further imply more purchasing power. With more people in employment, expenditure on welfare can go down (also in terms of the administration costs associated with operating the system) (Karoly et al., 2005).

Higher labour market participation and improved economic status in turn lead to a lower dependency on welfare and other types of programmes and benefits, and hence reduced government expenditure. Examples are unemployment insurance or social assistance benefits. Lower poverty rates also lead to reduced public spending on poverty-related measures. As before, these results apply to both the children participating in ECEC and their families (Lynch, 2004). Using the model outlined above, Lynch (2004) reports that the rise in earnings associated with ECEC is estimated to be 0.43% of GDP (which is about $107 billion, in 2004 USD). On the basis of their model and accounting for the labour market impact on mothers and children, PwC (2014) estimates that, by 2050, a reduction of the cost of childcare by 5% could translate into an increase in GDP of AUD$6 billion (which amounts to AUD$3.7 billion in net present value). Furthermore, considering the additional costs associated with ECEC, higher taxation revenues and lower expenditure on unemployment benefits, PwC (2014) finds that the benefits surpass the costs by a wide margin. Cumulative savings to the taxpayer by 2050 are estimated at AUD$1 billion (or AUD$0.5 billion in net present values).

The early childhood education and care sector

In addition to the above perspective, one also has to consider the economic impact of the ECEC sector, for example in terms of employment. In California, for example, the early childhood education and care sector directly employed between 154,000 and 169,700 individuals in 2011 (MacGillvary and Lucia, 2011). What is more, the sector is mostly composed of small and medium-size businesses, which are found to be imperative for innovation, job creation and economic growth. Calman and Tarr-Whelan (2005) report that in 2002 in the US the licenced childcare sector employed over 900,000 people as providers and teachers, and represented about $43 billion. Data for Europe are presented in sections 2 and 4.

3.4 Poverty, inequality, social cohesion and inclusion

3.4.1 Individual benefits

Other effects on the children participating in early childhood education and care that deserve further attention relate to poverty and inequality, social cohesion and inclusion. Growing up in poverty has detrimental effects on child development (Brooks-Gunn and Duncan, 1997; Conger, 2002; Alderman, 2011). Neville et al. (2013), for example, have associated poverty with issues in brain development.

Poverty is a multidimensional "wicked" problem (Lister, 2004), as a lack of material resources is inextricably intertwined with diverse forms of social and cultural exclusion. The number of children living in situations of poverty and social exclusion in Europe is estimated to be around 28% and it is not diminishing (Eurostat, 2015). Europe has stopped being a convergence machine regarding social and economic inequalities (Vandenbroucke and Rinaldi, 2015).

One of the major causes of poverty is lack of a decent job and the way to the labour market is probably one of the shortest ways out of poverty (on the condition that salaries are sufficient to rise above the poverty level). This is particularly the case for single-parent families, as these have a 30% more chance of being in poverty (Eurostat, 2015). Studies at the European level have shown that employment in general, and the employment of mothers in particular is influenced by multiple factors. Individual measures, such as parental leave, may have an equalising effect on the employment of men and women to a certain degree, but may also have counterproductive effects as less well-educated (and poorly paid) mothers tend to use longer parental leave than their better-off counterparts (Van Lancker and Ghysels, 2016). Collective measures, by contrast, such as an increased accessibility of ECEC, seem to yield a more sustainable impact on equality in the labour market (Maron and Meulders, 2009) than individual or fiscal measures. In sum, ECEC favours children directly as well as indirectly by influencing their parents' material conditions.

Indeed, ECEC has not only the potential to benefit the material conditions of families. State-of-the-art theoretical models of child development also reflect the interactions between biological, psychological and social factors. The latter include proximal factors (e.g. parent–child relations and social support) as well as more distal factors (e.g. socio-economic status, neighbourhood and being part of minority groups). In this vein, living in a poor family may represent multiple risk factors. Parents in poverty face more stress-related situations and may therefore have more difficulties in concentrating on their parenting tasks. Most often, they also live in neighbourhoods that are less adapted to the education of young children and more frequently lack high-quality services.

Several studies have documented how multiple adverse conditions impact ECEC and impede children from accessing affordable, high-quality provision. Webster-Stratton et al. (2001) and Vandenbroeck et al. (2008), for example, document that there is an absence of high-quality ECEC provision in vulnerable neighbourhoods. Furthermore, living in adverse circumstances also has negative consequences on an individual's health and learning. Job insecurity has a negative impact on well-being, stress and marital conflicts (Brotman, et al., 2013). Moreover, stress has negative consequences for learning processes (Rhoades et al., 2011). In addition, parental disciplining behaviour that is less well-adapted is found to

have a negative impact on the socialisation processes of the child (Dodge et al., 1994). Finally, limited parental responsivity has negative long-term effects (Shaw, 2013).

These reasons, taken together, are some of the crucial ones explaining why inequality gets 'under the skin' (Wilkinson and Pickett, 2009) and why poverty tends to be reproduced generation after generation. They are also highlighted by the EPPSE study, which showed – besides ECEC – the long-term effects of the learning environment at home. They account for why, in order to combat the intergenerational transmission of poverty, two-generation programmes are proposed that combine (material and immaterial) support for parents with ECEC for young children (De Mey and Vandenbroeck, 2014). In this vein, ECEC plays a critical role, as it not only broadens the educational experiences of children, and – in doing so – may buffer the influence of parental education on the development of the child. It also facilitates access to employment and may positively impact on parental aspirations and behaviour.

3.4.2 Societal benefits

Social inclusion and social cohesion

Early childhood education and care contributes to social inclusion and social cohesion in several ways. One example relates to the social support function, which has been described in more detail in the previous section. As ECEC ensures social support through bonding and bridging, it brings together children and parents of different backgrounds in a familiar environment. It has been demonstrated that having young children is a matter that can connect people from diverse origins and socio-economic statuses (Geens and Vandenbroeck, 2013). In a context of increased diversity, or even super-diversity,[18] ECEC can, therefore, contribute to social cohesion and social inclusion through this channel. In most European cities, there is no majority. In Brussels, Europe's capital, for example, the number of frequently spoken languages has risen to 104 and 50% of families in Brussels are multilingual (Janssens, 2016). Against this background, academics and policy-makers have pointed to the role of the educational system in general, and to ECEC in particular, on supporting social inclusion and cohesion (OECD, 2006; European Commission, 2015). Meeting places for parents and young children have mushroomed worldwide over the last few decades, e.g. in countries like England and Australia (Needham and Jackson, 2012), and in Belgium, France, Italy and Japan (Musatti et al., 2016).

Integration

In 2015, asylum seekers filed 1.26 million first-time applications in EU Member States, more than twice the number in 2014 and a record high (Eurostat, 2017). The number of first-time applicants remained high in 2016, at 1.21 million. A large proportion of recently arrived refugees and asylum seekers are young children and many of them, as well as their parents, have experiences of high levels of stress and trauma, which pose significant risks to well-being and future development (Sevazzi, 2016) as well as to their prospects of future integration into their new communities (Hooper et al., 2016). Early childhood education and care systems and services have the potential to address the essential needs of these vulnerable young children at a critical stage in their development. Often one of the first and most intimate points of interaction between receiving societies and refugee families with young children, ECEC programmes provide services at a critical period in children's development that can help mitigate the risk factors described above. They can also play a central role in supporting their families' long-term integration outcomes. Yet, research examining successful strategies in serving young refugee children and their families in early childhood remains scant, and young refugees in their earliest years often receive little policy attention or resources (Vesely and Ginsberg, 2011; Park et al., 2017).

Inequality

[18] Super-diversity is characterised by "a dynamic interplay of variables among an increased number of small and scattered, multiple-origin, transnationally connected, socio-economically differentiated and legally stratified" populations (Vertovec, 2007).

In Europe, economic and social inequalities have been on the rise since the onset of the crisis in 2008. This has consequences that go beyond growing income and wealth gaps (Karoly et al., 2005). These trends have also been recorded in the US. While income inequality has been given quite a lot of attention in recent years, the consequences for different aspects of life need to be regarded. A few examples of such consequences are family functioning, health, social cohesion and crime (next to a wide range of other effects) (Chevalier et al., 2006). In the field of education, there also is a substantial literature that assesses (in)equalities of opportunity and their impact on outcomes later in life. Participation in early childhood education and care can serve as a way to level the playing field for all children, and overcome educational inequalities of opportunity later on.

3.5 Health and well-being

3.5.1 Individual benefits

In line with beneficial impacts on development and behaviour, there is ample evidence that participation in early childhood education and care can lead to improvements in individuals' health and well-being, which in turn are reflected in lower health-related costs. The study by Karoly et al. (2005) summarises effects documented in the literature that are related to pregnancy and childbearing, accidents and injuries, child maltreatment, smoking and other factors. The study finds that participation in ECEC lowers incidences of teen childbearing as well as the number of babies with a low weight at birth. Moreover, child maltreatment would be reduced (as a consequence of better-educated parents). Reynolds et al. (2011), comparing children who participated in the CPC early childhood education and care programme with those who did not using propensity score matching techniques, find that health insurance coverage rates for the former are significantly higher than for the latter (75.9% versus 63.9%).

Still, other work has pointed to rather mixed evidence. Mitchell et al. (2008), for example, review several studies that examine the relation between ECEC attendance and children's health outcomes. A majority of the studies analysed pointed to positive or neutral neutral outcomes (e.g. no differences in terms of injuries between care at home and at an ECEC provision) and four studies reported negative outcomes (e.g. children contracting more infections). All 11 studies, however, only presented short-run outcomes. Also, children's health outcomes are often assessed on the basis of what their parents report, which is likely to be somewhat subjective.

In their paper, Wolfe and Haveman (2002) present an overview of health-related effects associated with education. Such effects may indirectly follow from investment in early childhood education and care, through its impact on educational attainment. Wolfe and Haveman (2002) refer to the substantial literature suggesting there is a positive relationship between individuals' education levels and their health (see e.g. Leigh 1981, 1983; Berger and Leigh, 1989; Kenkel, 1991; Sander, 1995), and life expectancy (Feldman et al., 1989; Crimmins and Saito, 2001). This relationship can be attributed to the improved knowledge of the relationship between healthy behaviours and health outcomes. To give one example, Kenkel (1991) uses measures of health knowledge about the use of alcohol, cigarettes and exercise to determine its impact on health. He finds that the relationship between schooling and health can be partially explained by health knowledge. Sander (1995) focused on smoking and reports that education raises the probability that individuals, both men and women, quit smoking. Crimmins and Saito (2001) compare white and African American men and women with 0-8, 9-12 and 13+ years of education in terms of their life expectancy. Regardless of race and gender, life expectancy was always highest for individuals with the highest education level. In 1990, life expectancy at the age of 30 of white men stood at 47.9 years for those with 13+ years of education, while the number for those with 0-8 years or 9-12 years of education stood at 41.2 and 44.3 years, respectively. For African American men, the divergences in life expectancy for different education levels were even larger: here, the numbers are 33.2 years (0-8), versus 38.3 years (9-12) and 45.0 years (13+). For women, the pattern was similar but the differences smaller.

When it comes to mental health, studies show a positive relationship between education and the ability to deal with stress and anger (Thoits, 1984; Schieman, 2000), which is also reflected in a lower prevalence of mental illness and depression (Robins, 1984; Herzog et al., 1998). Better-educated individuals also have more access to information on health and are able to use it more effectively (e.g. they may better grasp the long-term consequences of exercise and a heathy diet). Other indirect effects on health follow from occupational and locational choices: better-educated individuals have a higher propensity to choose occupations with lower occupational hazards (e.g. blue-collar versus white-collar jobs and the associated risks) (Wolfe and Haveman, 2002).

The importance of having good health during childhood has also been stressed by Currie and Madrian (1999). These authors argue that individuals with poor health during childhood have worse health during adult life and face negative consequences on their educational attainment and cognitive abilities. The latter result can be explained by absence from school, missing lessons or failure to complete education, but also by the developmental impact. Poor health during adult life, in turn, is reported to have negative effects on labour market outcomes, including lower productivity, lower wages, lower participation rates or withdrawal from the labour market, earlier retirement and even discrimination (Currie and Madrian, 1999). Note, however, that the magnitude of some of these effects is highly dependent on the measures used to capture them as well as the assumptions made in setting up the model. In addition, it is difficult to establish causalities and pinpoint specific advantages or disadvantages.

Another important point that relates to health and well-being is that early childhood education and care is a crucial time for forming healthy behaviours. As is documented in the most recent *Starting Strong* report of the OECD, if the importance of good nutrition and physical activity is taught to young children, they can form healthy habits that stick with them throughout their lives (OECD, 2017).

3.5.2 Societal benefits

The effects of early childhood education and care on health and well-being in relation to government spending and revenues are also addressed by Karoly et al. (2005). These authors argue that reductions in the incidence of teen childbearing would result in lower costs to public health care and to social welfare programmes (Wolfe et al., 2001). Closely related to this topic are the reduced medical costs associated with low birthweight babies, which can be explained by improved pregnancy outcomes. Furthermore, a more limited prevalence of child maltreatment would translate into lower costs to the child welfare system and lower costs to victims of abuse. In other words, improved health and overall well-being are associated with reductions in expenditure on health-related programmes.

3.6 Crime and justice

3.6.1 Individual benefits

Early childhood education and care is also associated with reductions in criminal behaviour, which in turn results in less expenditure on crime and the justice system at the societal level. There are quite a few studies that highlight this positive effect of ECEC on criminal behaviour at the individual level (e.g. Reynolds, 2000; Karoly et al., 2005; Hasan, 2007). ECEC's effects on crime are typically assessed by considering the incidence and the number of arrests, time spent in prison or jail and substance abuse (Karoly et al., 2005). In their comparison of cost–benefit analyses of ECEC programmes, Karoly et al. (2005) present results for the Perry Preschool programme that exclude and include intangible crime costs (which attempt to capture costs to the victim of the crime). When intangible crime costs are excluded, the total benefits of ECEC attendance to society per child amounted to $76,426. However, when intangible crime costs were taken up in the analysis, this number increased to $129,622 – in turn raising the ratio of benefits over costs from 5.15 to 8.74. Although intangible costs may prove difficult to estimate, such costs are important to take into account in an evaluation of the costs and benefits associated with ECEC. In addition, even when intangible costs are excluded, Karoly et al. (2005) still show a large, positive ratio of benefits over costs.

Another example is presented in the work by Reynolds et al. (2011). In their study of the impact of participation in the CPC early childhood education and care programme on an individual's well-being at age 28, Reynolds et al. (2011) report on substance, drug and alcohol abuse, different types of arrests and incarceration (criminal behaviour being one of the topics on which they concentrate their analysis). The authors find a significantly negative effect of ECEC attendance on substance use, with substance use rates decreasing from 18.9% to 13.7% (this difference is statistically significant at the 1% level). For drug and alcohol use, the results were comparable: for those who did not participate in ECEC, rates stood at 23%, which is significantly higher than the rate of 16.5% for the other group (again at the 1% level). In addition to these findings, Reynolds et al. (2011) suggest that, compared with children who did not attend ECEC, children participating in ECEC had significantly lower rates of crime and justice involvement (54.3% versus 47.9%), felony arrests (24.6% versus 19.3%) and incarceration (21.1% versus 15.2%). The study did not detect any statistically significant impact on number of arrests or for convictions.

Moreover, there are again indirect effects of ECEC that run through the associated education and labour market effects (Wolfe and Haveman, 2002). Indeed, previous research has highlighted that education decreases criminal activity (Freeman, 1995; Lochner and Moretti, 2001) as well as recidivism (Sherman et al., 1998). Sherman et al. (1998) devote their attention to crime prevention, assessing which methods work and which ones do not. These authors separate measures pertaining to communities, families, schools and the labour market, from those adopted by the policy or criminal justice system. Among the effective measures listed, we focus especially on the role of schools and the labour market here. The contribution of schools lies in setting up school teams and organisational development, clarifying and communicating norms, teaching social skills and behavioural training. In the labour market, especially job training was found to be relevant. This study clearly highlights the important relationships between education and the labour market, on the one hand, and crime on the other hand.

The negative correlation between education and crime can be explained as follows (see Lochner and Moretti, 2001): for more educated individuals with better labour market outcomes (including higher wages), the opportunity costs of engaging in criminal activities are higher. In addition, education discourages behaviour that is associated with crime, such as impatience. In their study, Lochner and Moretti (2001) combine census data with other sources (e.g. state-level data) and conclude that the probability of incarceration is reduced by 0.76 percentages points for whites and 3.4 percentage points for blacks upon completing high school. For every additional male high-school graduate, the social benefit falls between $1,170 and $2,100 per year.

3.6.2 Societal benefits

Given that participation in ECEC helps to reduce criminal behaviour later on, lower public spending on justice is another outcome that has been attributed to participation in good quality ECEC (Mitchell et al., 2008; Van Belle, 2016). Lynch (2004) reports that criminal justice costs decline, not only because ECEC participants have lower crime and delinquency rates, but also their families have reduced rates. This author, using a model to estimate the budget effects in 2050 of introducing an ECEC programme in 2005, estimates that the savings of reduced criminality would total $422 billion by 2050 (of this amount, $77 billion would be reduced government spending on the justice system and the remainder would be savings for individuals). Karoly et al. (2005) similarly point to lower costs associated with the criminal justice systems and lower costs to victims of crime. In addition, government spending on measures to improve social cohesion and other social outcomes can go down. Mitchell et al. (2008) present figures for the HighScope Perry and Chicago CPC programmes (based on Karoly et al., 2001 and Reynolds et al., 2002): the reduction in criminal costs associated with the former was estimated at about $10,200 and for the Chicago CPC it was close to $6,000. The reduction in tangible losses to crime victims was estimated at about $10,700 and about $4,800, respectively.

On the topic of crime and justice, the magnitude of societal benefits of reductions in crime-related costs are expected to be (substantially) lower in Europe than in the US (Van Belle, 2016). The main reason for this is that especially the compensation of victims is considerably higher in the US than in the EU, although generally the costs linked to crime and justice are also found to be higher in the US. This does not, however, imply that the monetary impact of early childhood education and care on lowering crime-related costs in Europe is negligible (ibid.). Similar findings would also apply to other parts of the world. Mitchell et al. (2008), for example, make the same point for New Zealand.

3.7 Other effects

3.7.1 Support

One of the non-economic ECEC benefits for parents is that provision offers parents a place where they can meet in an environment that is familiar to them (Geens et al., 2015). In that way, ECEC contributes social support to parents. In fact, there is an abundance of robust research showing that social support is one of the more salient forms of parental support (Sarason et al., 1990; Jack, 2000; Armstrong et al., 2005; Geens and Vandenbroeck, 2014). Social support can take many forms, including informational material or emotional support. Besides through ECEC, parents can also rely on social support by participating in the labour market. Having a job substantially increases the number of social contacts a parent has with other parents, not only through contacts with colleagues at work, but also through the material means one obtains to develop one's social life (Bradt et al., 2015). This form of social support, however, is not present for those outside the labour market. Research by Rullo and Musatti (2005) and Musatti et al. (2016) confirms that having an informal network of parents may make a significant contribution and act as a buffer for parental stress. Social bonds are associated with well-being (OECD, 2011b). Geens and Vandenbroeck (2014) find that social support is more effective when it combines bonding, i.e. meeting parents in similar situations, and bridging, i.e. meeting parents of other origins or other socio-economic status. It is precisely by supporting both functions, bonding and bridging, that ECEC provides support. Besides these examples of social support, parents naturally also benefit from the support received by professionals working in early childhood education and care.

3.7.2 Spillover benefits

An interesting result from investing in early childhood education and care at the individual level is what Karoly et al. (2005) refer to as "spillover benefits and beneficiaries". More specifically, early childhood education and care brings individual benefits that are not solely restricted to the child and his or her family (i.e. parents), but fall on the descendants of these children – their own children and grandchildren.[19] These intergenerational effects have also been documented by Wolfe and Haveman (2002) and Belfield (2005). Karoly et al. (2005) show that the benefits of ECEC have a substantial impact on a participant's descendants. If participation in ECEC, for example, results in higher labour market participation, there will be fewer children in the next generation who grow up in poverty or in low-income families that are dependent on welfare benefits for their survival. Note, however, that the expansion and improvement of ECEC might level the playing field for all children, which would imply that such intergenerational effects should become less and less important.

A first set of benefits derives from the connection between the education level of children and their parents (both mother and father) (Wolfe and Haveman, 2002). Children of parents with higher education levels have higher rates of high school completion (and their probability of graduating augments with the education level of the parents), as well as better-developed cognitive skills (see e.g. Haveman and Wolfe, 1984; Duncan, 1994; Angrist and Lavy, 1996; Smith et al., 1997). Smith et al. (1997) find that this effect can be attributed mostly to the home environment (e.g. specific achievement behaviours like

[19] Whereas Karoly et al. (2005) also separate the results of spillover benefits for descendants from the spillover benefits for the government and the rest of society in their discussion, the latter two (i.e. the government and rest of society) are taken together in this report and are discussed under 'societal' benefits.

reading). In a more recent study, Davis-Kean (2005) revisits the relationship between parent education, family income and child achievement. She confirms earlier conclusions that parents' education has an indirect impact on child achievement through their achievement beliefs and the home environment. The amount of schooling that parents have achieved determines how they structure the home environment and how they interact with their child. Also parents' expectations proved to be important. Results differed across race groups, e.g. with regard to parents' expectations, yet a strong indirect effect on child achievement was found for African-American families, whereas for European Americans both direct and indirect effects were documented.

Other authors have focused on the education level of other family members and individuals with whom the child comes in contact. Blau (1999), for example, reports that the education of grandparents has an impact on children's cognitive development. A few studies have focused on the education of neighbours and argue that it may affect the probability of high school graduation (Duncan, 1994; Ginter et al., 2000). Ginter et al. (2000) especially point to the role of family income, relative to the income of other families living in the neighbourhood, as affecting children's outcomes (rather than just the number of low- or high-income families living in a neighbourhood).

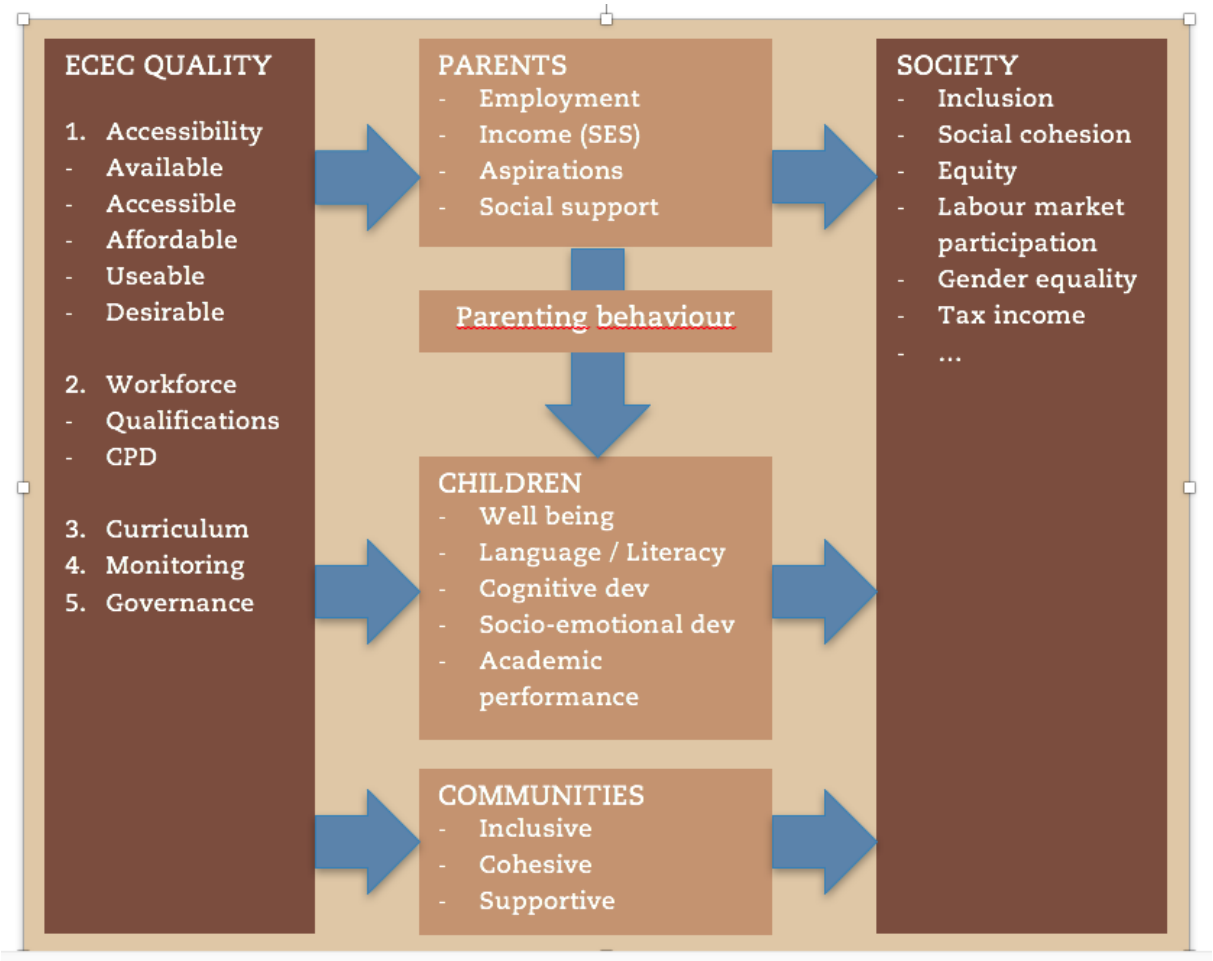
Wolfe and Haveman (2002) list the health-related impacts of education on descendants. These effects are not direct effects of early childhood education and care as they follow from the improvements in educational attainment that investing in ECEC engenders. Earlier examples of such effects are presented by Edwards and Grossman (1979), Shakotko et al. (1981) and others, who document that children's health is related to the education of their parents and especially that of mothers. More particularly, education is associated with lower child-mortality rates, higher birthweights and higher vaccination rates. Mothers' education also affects the incidence of teen pregnancies of their daughters (Wolfe et al., 2001).

3.8 Concluding remarks

Bringing this evidence together, it is clear that early childhood education and care carries great potential to have a beneficial impact on individuals and society, in the short as well as the long run, over a range of domains. This section briefly summarises the key results.

As Figure 10 shows, ECEC may have a profound impact on societies and more specifically on inclusion, social cohesion, equity, labour participation, etc., and in so doing, investing in it yields important social and economic effects. This is the case because ECEC is one of the few provisions that impact directly on parents and children, as well as indirectly through parents on children and on local communities. ECEC potentially impacts on parents' opportunities in the labour market and thus on income. As a result, it also impacts on parental networks and social support opportunities and on the aspirations parents have for their children, which in turn may affect children's achievements. ECEC also directly impacts on children's cognitive, social and emotional development. And, in addition, it may reinforce the social cohesiveness and inclusiveness of local communities. Obviously, not all ECEC fulfils these ambitions. The extent to which ECEC is able to meet the expectations will depend on its quality – more specifically its accessibility, the quality of the workforce, the curriculum, how it is monitored and the quality of governance mechanisms. These conditions are explored in further detail in the following section.

Figure 12. Impact of early childhood education and care on individuals and society



Note: CPD refers to Continuing Professional Development
Source: Own elaboration based on results presented in this report.

4. Conditions for realising the potential benefits of early childhood education and care

From the scientific research presented in the previous sections, it is clear that the potential benefits of high-quality early childhood education and care are considerable, far-reaching and long-lasting, which explains why academics and policy-makers have advocated investing in it. Still, investment should be considered carefully, as research has emphasised the need for accessible, affordable and high-quality ECEC. Indeed, the beneficial impact of ECEC is not to be taken for granted, but depends greatly on the quality of provision. Moreover, the challenge lies in ensuring that all children have equal access to high-quality provision, avoiding social stratification in access and tackling inequalities (Penn, 2007; 2009; 2011; Lloyd, 2008). As such, the issues of accessibility, affordability and quality are, at least to some extent, intertwined.

In the remainder of this section, the factors contributing to the accessibility, affordability and quality of early childhood education and care will be explored in more detail. The selection of factors to consider for further examination is based on the academic literature as well as other documents guiding policy-makers. One example of such documents is the OECD's *Starting Strong* series. In the first edition (OECD, 2001), seven principles were brought to the attention of national policy-makers in the domain of early childhood education and care:

1) expand provision towards universal access;
2) raise the quality of ECEC provision;
3) promote coherence and coordination of policy and services;
4) explore strategies to ensure adequate investment in ECEC;
5) improve staff training and working conditions;
6) develop pedagogical frameworks appropriate for young children; and
7) engage parents, families and communities.

Since then, much progress has been made with regard to early childhood education and care. The enrolment rates and the number of hours children spend in ECEC have been on the rise over the past decade (OECD, 2015). Nevertheless, the role of teachers and other staff, the impact of the ECEC system and curriculum (e.g. the presence of educational guidelines), and the policy framework governing ECEC remain key determinants of its affordability, accessibility and quality. Each of these factors will be examined in more depth below.

4.1 Role of the policy framework

The first section of this part of the report addresses the broader context and policy framework informing investment in early childhood education and care. It begins with a discussion of the background and then continues with an analysis of the policy measures and initiatives taken on ECEC at the EU, national and sub-national levels.

In the literature, several reasons have been put forward as to why governments need to invest in ECEC. Besides the economic and non-economic benefits that ECEC comes with, Chevalier et al. (2006) present arguments related to market imperfections. A first argument is *imperfect information*: parents may not have all the information needed on the returns and quality of ECEC when making decisions – notably on their children's behalf – on whether to have their children participate in ECEC. As a result, they may not take the optimal decision. A second argument is parents' *financial constraints*. Due to financial constraints, parents may not make the optimal decision, even with perfect information. Such constraints could also imply that some parents may have less access to information than others (e.g. when it is costly to obtain information). Financial constraints are expected to weigh especially on parents with a low socio-economic status, which raises inequality. A third argument is that *education is not a repeatable* process. Instead, there is ample evidence that shows that one needs to reach certain stages in

development to be sufficiently prepared to move on to the next stage. Moreover, recent economic research on skill-biased technological change and labour market polarisation confirms that the returns to education may very well increase over time. This argument has in fact already received substantial support in the empirical literature. Becker (2002), for example, asserts that education is more highly valued in today's knowledge economies than it was before, as is reflected by the growing wage differentials between high school and college graduates (in the US) or increased unemployment of individuals with low levels of education (in Europe). On both sides of the Atlantic, the demand for skilled workers has accelerated. Furthermore, these dynamics are reinforced by the increased importance of life-long learning resulting from technological progress and digitalisation.

For all these reasons, government intervention in ECEC would be necessary. Such intervention can take different forms, e.g. making participation in ECEC compulsory or using subsidies to reduce costs. Across the EU, early childhood education and care has become a priority of policy-makers at different levels of government. This can, at least in part, be explained by demographic, economic and social developments. Examples are the ageing of the population, declining fertility rates, a growing share of single-parent families, and an increase in the number of dual-earner households (OECD, 2001). All these dynamics call for a further development of an efficient system of parental leave, and for high-quality, affordable and accessible early childhood education and care facilities. Policy-makers at all levels of government have become aware of the fundamental importance of ECEC and the need to strengthen it, and also among the practitioners on the ground a similar, perhaps even stronger signal, has been given (OECD, 2001).

These dynamics are set against a background of the Great Recession. Although Europe is recovering from the financial–economic crisis that started in 2008 and the subsequent euro-area debt crisis, both have had a tremendous impact on government spending in almost all EU Member States. In many, especially the budgets foreseen for education and social policy have been reduced (or budgets have not been adjusted to new dynamics – e.g. budgets have remained at the same level while the funding needed has grown and a shortage emerged). Considering that both the public sector and the private sector offer childcare services and pre-primary education, funding-related concerns are relevant. In addition to its impact on government spending, and perhaps even more importantly, the crisis has put severe pressure on the financial security and stability of families across the EU, pushing many into unemployment and poverty. The costs of living have gone up while benefits and services have diminished (Eurochild, 2011). Financial hardship not only affects the material circumstances in which children grow up, but also has consequences for their well-being (e.g. due to increased stress levels within their family), and on social inclusion more generally – in addition to other impacts (ChildONEurope, 2011). What is particularly concerning about these developments, is that the crisis has worsened the situation of disadvantaged children especially.

With research documenting the contribution of early childhood education and care to improving child development and outcomes, it has rightfully earned a place at the top of the policy agenda, and access to high-quality ECEC provision needs to be ensured for all children. At the EU level, this has already been acknowledged. It is reflected in the extensive list of policy documents put forward by the EU institutions to promote participation in early childhood education and care, especially among vulnerable and disadvantaged groups (e.g. the ECEC Quality Framework launched in 2014, and the European Commission Communications on schools (2008), on ECEC (2011) and on improving and modernising education (2016a), among other policy documents). Also in the recently launched European Pillar of Social Rights, early childhood education and care has been put forward as a priority: "Children have the right to affordable early childhood education and care of good quality." Moreover, improving the quality and effectiveness of ECEC in Europe would contribute to achieving the goals of the Europe 2020 strategy, aiming at smart, sustainable and inclusive economic growth.

At the level of the EU Member States, there is more heterogeneity. Whereas some Member States have made the topic of early childhood education and care a policy priority, others have devoted less attention and efforts to it. A further exploration of how Member States approach ECEC is presented below.

Before delving into the remainder of this section, it is important to recall that many of the benefits that follow from participation in early childhood education and care only materialise in the long run (with the economic benefits for society at large being a prime example). This implies that policies pertaining to early childhood education and care need to be embedded in a much broader, well-functioning policy framework to ensure that they are not lost along the way as individuals grow up. To this end, not only do education policies need to be well-aligned, but also the measures and initiatives taken in other domains like employment or social policy (European Commission, 2011). This may prove to be a challenging task, in which a variety of levels and departments of government need to take up a shared vision and common goals, and develop coherent approaches, while at the same time good interactions with the most relevant stakeholders need to be assured. Nonetheless, this also enables governments to learn from best practices found in other settings or jurisdictions.

4.1.1 Interaction between the EU, national and sub-national levels

In Europe, responsibilities for early childhood education and care are typically shared across different levels of government (OECD, 2015). Along with responsibilities, also the financing of ECEC typically is a shared task, with national as well as sub-national government levels contributing their part. In many Member States, parents are also required to pay a fee or are eligible for subsidies.

Especially the national level plays an important role in ECEC, as national governments are responsible for financing, standards setting, curriculum development and monitoring of provision (Janta et al., 2016). In some countries, for example Belgium, Germany and the UK, (some of) these tasks are taken up by regional or local governments. Several OECD reports emphasise the wide diversity in national approaches towards early childhood education and care, while acknowledging that most of them do encourage access to ECEC and provide funding to such provision.

Education traditionally is one of the competences over which the EU Member States still have most control. Nevertheless, it is crucial that the EU institutions continue their efforts in the promotion of early childhood education and care, stimulating governments to grant access to high-quality ECEC provision for all (Urban et al., 2012). Moreover, further initiatives towards an EU framework for the quality of ECEC and guidelines on how to implement research and policy conditions are also needed according to Urban et al. (2012). The EU has taken up this role, launching a framework of key principles for ECEC quality in 2014. This framework introduces ten action points pertaining to five domains to assure the quality of ECEC. Among the five domains are access to ECEC, the ECEC workforce, the curriculum, monitoring and evaluation, and the governance framework. Whereas governance is at the core of the current section, the four other domains are further explored in sections 4.2 and 4.3, which are devoted to the role of the system and curriculum, and the role of teachers and other ECEC staff, respectively.

Also at the international level, early childhood education and care has received a lot of attention in recent years (OECD, 2017). This is evidenced, for example, by the fact that the topic of education has been taken up in the 2015 Sustainable Development Goals. More specifically, one of the ten education-related targets is that "by 2030 all boys and girls have access to quality early childhood development, care and pre-primary education so that they are ready for primary education". In addition, the revised ISCED classification (i.e. ISCED 2011) produced by the UN has a broader definition of ISCED 0: whereas previously ISCED 0 was restricted to programmes designed for children aged 3 and older (up to the official age for primary education enrolment), the new classification also includes education and care programmes for younger children.

4.1.2 National policy priorities in the field of early childhood education and care

Funding

The amount of public and private funds spent on early childhood education and care provision and on related policies sheds more light on the extent to which it is a priority for national policy-makers.

Furthermore, the financing part of early childhood education and care is also key to its affordability and accessibility for all children, regardless of the resources of their parents.

To gauge the importance of early childhood education and care across the EU, more details are presented on public spending on ECEC provision. Information is derived from the *National Sheets on Education Budgets in Europe* – the 2015 edition (the latest available one; European Commission, EACEA and Eurydice, 2015b) and the OECD Family Database. While the national budget fact sheets do distinguish between different education levels, information for ISCED 0 is not always available, or at least not at that level of disaggregation (but rather jointly with other ISCED levels, e.g. early childhood and primary education integrated into one category).

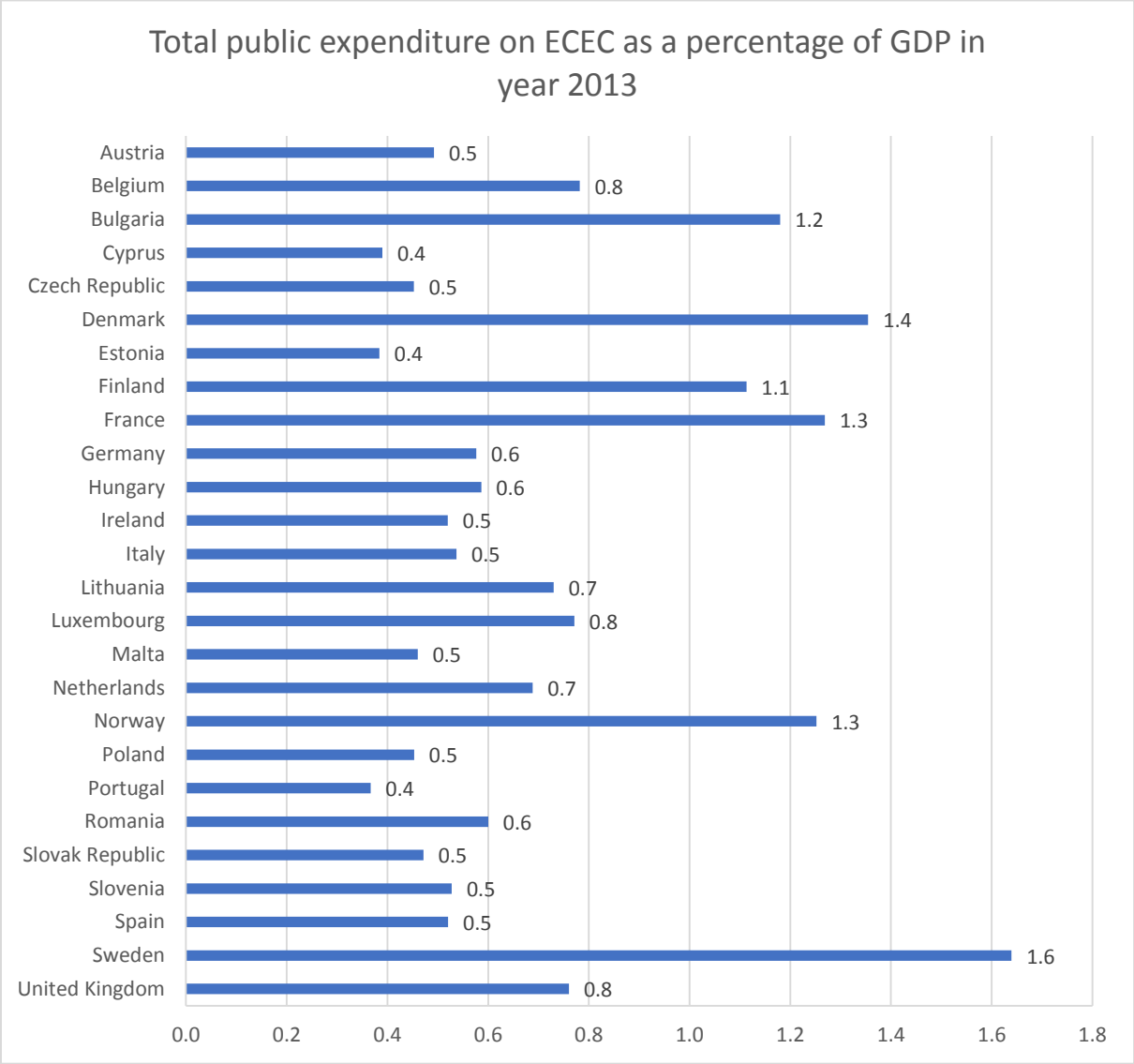
In many EU Member States, expenditure on higher ISCED levels exceeds that for lower levels (i.e. secondary and tertiary education receive more funding than ECEC and primary education).[20] In a few countries, the opposite situation holds. Denmark, for example, had expenditures of €8,477,541,117 for ISCED 0 and 1, €5,136,656,702 for ISCED 2 and 3, and €4,647,668,324 for ISCED 4-8 (according to its national fact sheet). Note, however, that this may also be due to differences in the absolute number of children enrolled in ECEC and other education levels.

In the OECD database, data on public expenditure on early childhood education and care include all public spending (in cash or in kind) directed towards formal day-care services (e.g. crèches, day-care centres, and family day care, generally aimed at children aged 0 to 2) and pre-primary education services (such as day-care centres and kindergartens, which offer a combination of education and care services to children from ages 3 to 5). In Figure 13, data on countries' public expenditure on early childhood education and care as a percentage of GDP are presented (for the year 2013). The EU average of public expenditure stood at 0.7% of GDP in 2013; the eurozone average stood at 0.6% of GDP in the same year. For the US, the public expenditure on early childhood education and care was 0.3% of GDP in 2013. Of the Member States for which data on total expenditure can be further broken down into expenditure on childcare and expenditure on pre-primary education, the majority has a higher expenditure on pre-primary education. Exceptions are Sweden (1.1% of GDP on childcare and 0.5% on pre-primary education) and Finland (0.6% on childcare and 0.5% on pre-primary education).

Over a 15-year period (1999–2013), public expenditure has increased in most EU Member States or at least remained relatively stable. Nevertheless, for a few Member States, the impact of the financial–economic crisis on public expenditure on education cannot be neglected. OECD data for the year 2009, for example, reveal that in nearly all Member States total public expenditure on pre-primary education as a percentage of GDP was below the 2013 level (e.g. for Denmark, it stood at 1% in 2009 versus 1.4% four years later). European Commission, EACEA and Eurydice (2013) present further details. Between 2000 and 2010, the total amount of public spending on education increased in the EU, though some Member States saw a decline in period 2007-2009 (e.g. Bulgaria, Italy, Greece, Portugal, and Romania). Especially countries running large deficits reduced their education budgets. Also after 2010, in 2011-2012, education budgets were cut in many Member States (over 5% in Croatia, Cyprus, Greece, Hungry, Italy, Latvia, Lithuania, Portugal, Romania, the United Kingdom (Wales)). Budget restrictions have had an impact across the boards, from investments in infrastructure and new programmes, to teacher salaries and financial support for students.

[20] On the basis of a survey analysis carried out in eight European countries, Busemeyer et al. (2017) conclude that the general public supports increasing investment in education. Yet, raising investment in general schooling and vocational education is more popular than raising investment in higher education and ECEC, according to the survey.

Figure 13. Total public expenditure on early childhood education and care in 2013 (% of GDP)



Notes: Data for Poland refer to 2012. For Bulgaria, Cyprus, Croatia, Lithuania, Malta and Romania, data are not adjusted for any differences in the entry age for primary schooling and cover all public expenditure regardless of the age of those using/enrolled in services. In some countries, local governments play a key role in financing and providing childcare services. Such spending is comprehensively recorded in Nordic countries, but in some other (often federal) countries it may not be fully captured by the OECD social expenditure data.

Source: OECD Family Database (http://www.oecd.org/els/family/database.htm).[21]

In addition to public funding devoted to early childhood education and care, there are other forms of financing. Cleveland and Krashinsky (2003), for example, distinguish between government funding of ECEC provision, direct and indirect financial subsidies to private providers of ECEC (grants, contracts and tax incentives), and direct and indirect financial subsidies to parents (cash benefits and allowances, tax benefits to offset costs, etc.). Local authorities contribute substantially to ECEC funding in some EU Member States. Besides government, private organisations also offer ECEC services, which are geared towards younger children in particular. This provision often receives public subsidies, but could also be entirely self-financed.

[21] To the best of our knowledge, these are the most recent OECD data available on expenditure on ECEC. Even in the most recent report (OECD, 2017), expenditure data are presented for year 2013. For other variables, more recent information is available.

Another source of funding comes from parents: with the exception of Latvia, Lithuania and Romania, parents have to pay for ECEC in all EU Member States (fees are commonly due until the child enrols in compulsory education, i.e. fees especially apply to younger children participating in ECEC). The level of these fees varies greatly but they are typically higher in countries where ECEC provision is largely private, although in many Member States reduced fees or other support measures exist for disadvantaged families. In other countries parental fees are calculated according to the families' income. The lowest fees are found in the Nordic countries and in Eastern Europe (European Commission, EACEA, Eurydice and Eurostat, 2014). In Bulgaria and Estonia, for example, average monthly fees stood at PPS50 in 2012/2013. For Croatia, Poland, and Slovenia, this number ranged between 100 and 200, more or less. In Denmark, Finland, Norway and Sweden, fees are relatively low when compared to average household income: in Sweden, the maximum fee was PPS 110. For the other three countries, fees amounted to PPS 200-300. Fees are especially high in countries with a lot of private ECEC provision (e.g. the UK, Ireland and Luxembourg). Eurostat data suggest that close to 14.4% of expenditure on ECEC in the EU28 in 2014 is from private sources (European Commission, EACEA, Eurydice and Eurostat, 2014). In Austria, Cyprus, Germany, Poland, Slovenia and Spain, this share is above 20%.

Monitoring quality through regulations and minimum standards

The monitoring and evaluation of early childhood education and care is a common practice in the EU that is aimed at assuring the quality of provision (European Commission, 2014). Monitoring and evaluation efforts have largely focused on four dimensions: i) the quality of the service, ii) the quality of the staff, iii) the implementation of the curriculum, and iv) child development and outcomes. These four dimensions also come back in the work of Urban et al. (2012), who argue that regulations and minimum standards for ECEC should be composed of the following aspects:

- a *governance framework* (establishing policy responsibilities at different levels of government and linking ECEC policies to the wider policy context);
- a *quality framework* (introducing criteria for the quality level required from all ECEC services, as well as ways to develop good practices and involve stakeholders);
- a *curriculum framework* (specifying overall goals, principles and competences for working with young children regardless of institutional setting);
- a *qualifications framework* (laying down the required professional preparation and professional development for all members of the ECEC workforce); and
- a *monitoring and evaluation framework* (ensuring that data on the ECEC sector are collected systematically and evaluations involving all key stakeholders are conducted regularly).

With regard to the latter, not only the Member State level but also the EU level could play an important role, by incentivising or even obliging countries to collect specific data and take part in evaluations.

Monitoring the quality of ECEC staff

Because the role of teachers and other staff will be discussed in more detail in section 4.3, attention will only be devoted to monitoring and evaluation of staff performance here. As will become clear below, there is abundant academic research on the importance of the staff working in ECEC provision. Staff quality is determined by individual, institutional, inter-institution and governance competences, which each may affect the quality of the teaching and care (which in turn have an impact on child outcomes). Staff performance is monitored and assessed in ECEC provision across the Member States. Importantly, to measure the quality of the staff, information about the performance of their students is needed. Finally, also the management of ECEC staff has to be well organised.

Monitoring the quality of the service

The quality of early childhood education and care provision is determined by a range of factors. Janta et al. (2016) identify the following key indicators: pedagogical approach, staff remuneration, working conditions, staff qualifications and experience, specialist learning and development support, group sizes

and child-to-staff ratios, and adequate resources for learning and play. Most of these determinants are discussed in section 4.2 and are therefore not addressed here. Generally, countries have introduced very specific guidelines or minimum standards for these determinants. For example, in some Member States group sizes cannot exceed a certain level.

In addition to ensuring quality, minimum standards and regulations on the service also guarantee the health and safety of children and level the playing field by enabling all children to benefit from ECEC (Belsky and Vandell, 2007; Eurydice, 2009).

Monitoring the quality of the ECEC curriculum

To ensure that the curriculum and content of early childhood education and care are aligned in all ECEC provision, EU Member States generally develop *curriculum standards and guidelines* that need to be met. Standards and guidelines are typically put forward by the national level, although in some countries also the regional level is involved (for example in Germany) (OECD, 2015). Often, such guidelines and standards are tied to a broader framework that also contains pointers on other issues, such as the qualifications needed by ECEC staff. Guidelines may also differ depending on the ECEC provision. For example, in public centre-based ECEC provision for children aged 3 and older, there are frequently specific educational guidelines that need to be followed (Van Belle, 2016).

Some countries have guidelines for monitoring and assessing the development of children, but this approach is heavily contested in the academic literature, where both the feasibility and appropriateness of (standardised) assessment at a young age are questioned. The European Commission, EACEA and Eurydice (2014) further report that standards and guidelines can be found in a range of different policy documents and strategies.

When it comes to the specific content of the standards and guidelines, Sylva et al. (2015) find that it can be distinguished into development (e.g. language skills), on the one hand, and learning types (e.g. learning by playing), on the other hand. These authors also report that the implementation of these guidelines and standards in some cases falls short or differs in practice.

Monitoring child development and outcomes

While there is a broad consensus regarding the need to monitor service quality, staff quality and curriculum implementation, the debate on the monitoring and evaluation of child development is very different. – notwithstanding that an evaluation of the performance of their students might be required to assess staff quality. Academics have raised serious concerns regarding the feasibility and desirability of this type of assessment and the results on its effectiveness have not been conclusive either. Formal assessments of outcomes to determine school readiness appear to have negative consequences on child development according to Taguma and Litjens (2013). On the other hand, informal monitoring, e.g. through observation of children's development, has positive effects. On this note, it needs to be emphasised that there is indeed a large and significant number of scholars from different disciplines who have argued that the evaluation of children's developmental outcomes is not a good quality indicator. Moreover, in academia there has been a lot of controversy surrounding the practice of standardised testing prior to the compulsory school age (e.g. Kagan, 1999). Many have argued that the testing of preschool children is unfeasible, and have opposed it as a principle.

Despite these concerns, the European Commission, EACEA, Eurydice, and Eurostat (2014) and Janta et al. (2016) report that all EU Member States monitor the curriculum and learning objectives related to children's progress and development through official educational guidelines. Also children's progress, achievements and outcomes are generally regularly assessed, next to the capacity-monitoring and planning systems of ECEC provision. In monitoring and evaluation, the involvement of key stakeholders, like experienced practitioners or the children's families, is essential. Janta et al. (2016) call for support of disadvantaged families and parental involvement.

With these considerations in mind, monitoring and evaluation, together with minimum standards and regulation, have generally proven their usefulness as levers to advance the quality of ECEC in Europe. Setting high-quality standards can be costly, but low standards, while cheaper, may be less effective and may not result in the outcomes desired. Even more so, studies measuring cortisol levels have shown that poor quality may be harmful for children as this may entail persistent levels of stress hormones in the children's brains (Gunnar et al., 2010). Research summarised by the OECD (2001; 2006) has claimed that children are more likely to experience developmental, social and language problems in low-quality ECEC provision. In sum, monitoring efforts remain important in early childhood education and care.

4.2 Role of the system and the curriculum

Besides the policy framework, there are other factors that influence the quality of early childhood education and care and the realisation of the benefits that attendance may bring to individuals and society at large. There is ample research that points to the important role of the ECEC system and curriculum (see e.g. Urban et al., 2011). In this section, the focus is on how ECEC is organised – bridging the gap between the current section and section 2.1 – and how that in turn impacts on affordability, accessibility and quality. Here the curriculum is carefully assessed.

4.2.1 Curriculum

The content and curriculum offered in early childhood education and care provision has an important impact on children's development (European Commission, EACEA and Eurydice, 2014). The quality of ECEC is, as a result, closely intertwined with the curriculum taught. In its "Key Principles of a Quality Framework" for early childhood education and care, the European Commission outlines two actions that relate to the curriculum: it should 1) be based on pedagogic goals, values and approaches that enable children to reach their full potential in a holistic way; and 2) require staff to collaborate with children, colleagues and parents and to reflect on their own practice (European Commission, 2014). The curriculum has been viewed as an important lever to ensure ECEC quality (OECD, 2017).[22]

With regard to the first condition, there is a broad consensus in the academic and policy literature that ECEC curricula need to be holistic and designed in such a way that they foster learning and development (European Commission, 2014; 2016a), while at the same time taking into consideration the young age of the children enrolled in ECEC. ECEC curricula typically focus on emotional, personal and social development, knowledge and understanding of the world, language and communication, creative expression, and physical development and movement – though there are large cross-country differences in how much attention is devoted to formal learning (e.g. numeracy, literacy and school readiness) (Laevers, 2005; European Commission, 2014).

To promote children's well-being, self-image and development, both education and care are essential (despite the shift in some countries to mainly focus on education activities). In this context, education refers to activities aimed at formal learning. Care, however, is equally important because care activities typically involve intensive communication as well as positive and reciprocal interactions between children and adults. In that way, they foster confidence, a sense of belonging and trust. It has been widely recognised that play is fundamental to support learning and development, as it stimulates decision-making, problem-solving and independence, among other things (European Commission, 2014).

Smith and Pellegrini (2013) summarise the academic evidence on development and play. They find that playing benefits development in the short, medium and long run. Locomotor play, for example, helps children in their physical development by strengthening muscles, building endurance and advancing motor skills. Another example is language play, in which children train in speech and learn how to use

[22] It is to be noticed that the attention on the positive impact of ECEC – not only at the individual levels of parents and children, but also at the levels of communities – is increasingly apparent in local curricula, notably in New Zealand and the Flemish Community of Belgium.

language to express themselves (vocabulary, grammar and syntax). The authors further report that adults can support children by structuring play, suggesting themes, participating in play or making play more educational by introducing specific activities or materials.

As regards the second dimension, the collaboration between ECEC staff members and parents or other relatives, will mostly be explored in sections 4.3 and 4.4. In this section, we already point out that involvement and cooperation from the parents is relevant, as it can enable practitioners to draw on the experience and knowledge of the parents and parents to benefit from the knowledge and support of trained professionals. Engaging parents, therefore, also promotes child development (OECD, 2001). The OECD (2001) emphasises the complementary roles of parents and professionals in ECEC.

4.2.2 System

There is substantial heterogeneity in early childhood education and care provision across Europe. In this section, we focus on those characteristics of ECEC systems that may influence their accessibility, affordability and quality. In Table 1, some of the core features of ECEC provision are presented, based on the 2016 OECD *Education at a Glance* database.

Table 1. Characteristics of provision of early childhood education and care

	Earliest starting age	Usual starting age	Usual duration (in years)	Usual starting age in ISCED 1	Entry age for compulsory programmes (if applicable)	Length of compulsory programmes (in years) (if applicable)	Full-time (FT)/part-time(PT)
Austria	3	3	3	6	5	1	FT
Belgium	2.5 to 3	3	3 to 4	6	–	–	FT
Czech Republic	3	3	3	6	–	–	FT
Denmark	0	1	5	6	–	–	FT
Estonia	0	3	4	7	–	–	FT
Finland	0	1	5 to 6	7	–	–	FT
France	2	2 to 3	3	6	–	–	FT
Germany	2.5	3	3	6	–	–	FT
Greece	4	4	1 to 2	6	5	1	FT
Hungary	3	3	3	7	5	1	FT
Ireland	3	3	1	4 to 5	–	–	FT/PT
Lithuania	0	3	4	7	–	–	FT
Luxembourg	3	3	3	6	4	2	FT
Netherlands	3	3 to 4	2 to 3	6	5	1	FT
Poland	3	2 to 3	4	7	6	1	FT
Portugal	3	3	3	6	–	–	FT
Slovakia	2	3	3	6	–	–	FT
Slovenia	3	3	3	6	–	–	FT
Spain	0	2 to 3	3 to 4	6	–	–	FT
Sweden	1	1 to 2	4 to 5	7	–	–	FT/PT
UK	0	3	2	5	–	–	FT/PT

Note: Based on OECD definition of ECEC provision, no distinction is made between public or private provisions.
Source: OECD (2016), *Education at a Glance* report.

Starting age

The earliest starting age to be enrolled in ECEC ranges from 0 to 4, with one group of countries allowing children to enrol from birth (e.g. Denmark, Estonia, Finland, Lithuania, Spain and the UK) and a second group of countries allowing children to enrol from the age of 1, 2 or 3. Nevertheless, the usual age at

which most children start participating in ECEC is 3. In the vast majority of the Member States, children transfer from ECEC to primary education (ISCED 1) at age 6 or 7.

With regard to starting age, the research by Heckman (2006) points to the need for early participation, especially for children of disadvantaged families. Yet, other authors have raised serious concerns about starting participation in ECEC below the age of 1, especially when combined with many hours of ECEC attendance (e.g. Bradley and Vandell, 2007; Jacob, 2009; Phillips and Lowenstein, 2011). Other work has found that a starting age of 2 to 3 is preferable as it will give rise to the best outcomes in developmental terms (e.g. NICHD Early Child Care Research Network, 2004; Loeb et al., 2007; Melhuish et al., 2015). When it comes to the entry age of compulsory education, the OECD data presented in Table 1 are less complete. For the countries for which data can be derived, entry ages were between 4 and 6 years old.

Programme duration

In the OECD (2016) *Education at a Glance* database, there is less information available on the length of compulsory programmes. The length of compulsory programmes typically is one to two years. In the bulk of European countries, ECEC services are full-time. In a handful of countries, both full-time and part-time services are available (e.g. Sweden and the UK). Research has generally detected a positive relation between the duration of ECEC and educational outcomes, but no consensus has been reached on the precise number of years that would be optimal (Melhuish et al., 2015). In their analysis of the Chicago Child-Parent Center education programme, Reynolds et al. (2011) do not find a statistically significant relationship between the length of preschool and well-being (measured on the basis of five topics: educational attainment, socio-economic status, health status and behaviour, criminal behaviour and family outcomes).

Additionally, research on differences in outcomes resulting from part-time and full-time participation in early childhood education and care is inconclusive (Melhuish et al., 2015). Also with regard to the difference between centre-based and home-based care, results are varied.

Child-to-staff ratios

Another factor contributing to the quality of early childhood education and care is how the system is set up. One dimension of how ECEC is organised relates to the child-to-staff ratio that is maintained in the ECEC provision. This ratio is calculated as the (full-time equivalent) number of children making use of the ECEC services per (full-time equivalent member of) staff. Contact between the child and any kind of staff member is considered, regardless of whether it is a teacher or another staff member.

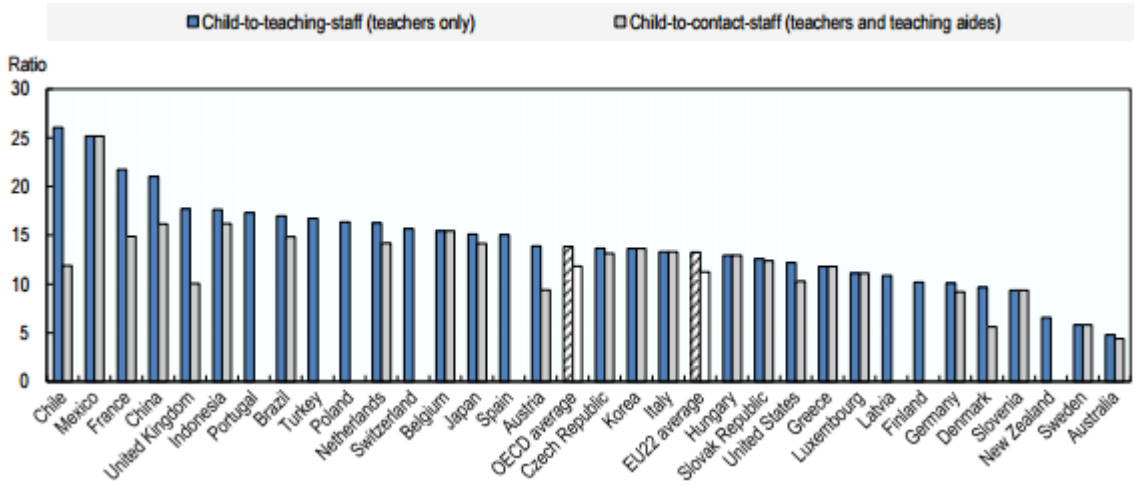
The child-to-staff ratio is just a single quality measure, but nevertheless a relevant one as it accentuates the resources available in early childhood education and care as well as the frequency of contact between the children and staff members. As Perlman et al. (2017) explain, better ratios, i.e. fewer children per staff member, are believed to be associated with improved child outcomes due to the increased contact, both in terms of individual interactions and in terms of educational interactions. Child-to-staff ratios have, therefore, been incorporated into both national and international quality ratings of ECEC, such as the US Quality Rating and Improvement Systems (see Perlman et al., 2017). This point is also stressed in the OECD's work on the topic.

Nevertheless, academic research on the relationship between child-to-staff ratios and the children's outcomes has yet to reach a consensus on the nature of this relationship (Perlman et al., 2017). Whereas a large number of studies have found a positive link (e.g. Burchinal et al., 2000; Melhuish et al., 2015), others have reached rather different conclusions. In their synthesis of 29 studies on this topic, Perlman et al. (2017) conclude that on average the child-to-staff ratio stands at 8.65. Child-to-staff ratios for pre-school children ranged from 5 to 14.5 across the different studies. Still, the authors report a considerable diversity in how these ratios are constructed and evaluated, and in the child outcomes with which they

are associated. Both issues complicate comparative analyses and hence the results should be considered with caution.

Despite these challenges, it is important to take a closer look at child-to-staff ratios in ECEC provision in Europe. In its 2016 *Education at a Glance* report, the OECD (2016) published statistics on child-to-staff ratios found in a range of countries – making the distinction between child-to-teacher and child-to-contact-staff (i.e. teachers and teaching assistants). Data for the year 2014 are available for children enrolled in pre-primary education in most OECD countries (i.e. children of ages 3 and up, ISCED 2011 level 02). Data are also available for early childhood educational development services, though only for a subset of countries (i.e. ECEC services classified under ISCED 2011 level 01 and with an intentional education component targeted mainly at children aged 0 to 2). On average, the child-to-teacher ratio was 13.8 in 2014 in the OECD, meaning that each pre-primary education teacher was responsible for 14 children (but there are vast disparities across the countries, as illustrated in Figure 14). For early childhood development services, which are depicted in Figure 15, the numbers seem to be somewhat lower (with an average of 9 for the child-to-teacher ratio, though this average is based on a smaller sample of countries). Especially in Sweden and Germany, staff members are responsible for just a small group of children.

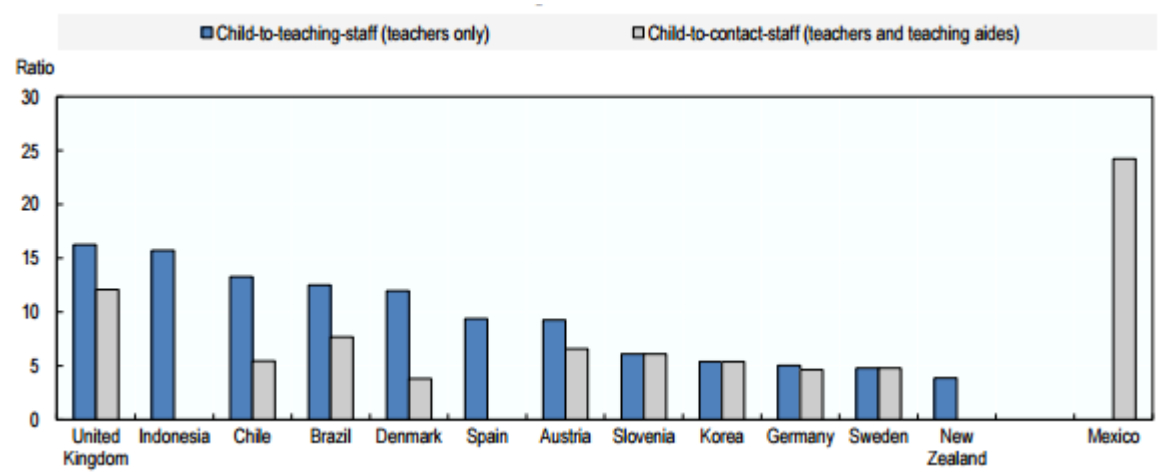
Figure 14. Average child-to-teaching-staff and child-to-contact-staff ratios in pre-primary education services, 2014 (public and private ISCED 02(0) services, based on full-time equivalents)



Notes: The figures should be interpreted with some caution because the indicator compares the teacher/student ratios in countries with "education-only" and "integrated education and day-care" programmes. In some cases, the staff requirements in these two types of provision are very different.

Source: OECD (2016), *Education at a Glance* report.

Figure 15. Average child-to-teaching-staff and child-to-contact-staff in early childhood development services, 2014 (public and private ISCED 01(0) services, based on full-time equivalents)



Notes: The figures should be interpreted with some caution because the indicator compares the teacher/student ratios in countries with "education-only" and "integrated education and day-care" programmes. In some cases, the staff requirements in these two types of provision are very different.

Source: OECD (2016), *Education at a Glance* report.

Group size

A related measure is group size: How many children are part of an ECEC group and does this have an impact on child outcomes? Also here, research appears to be mostly inconclusive (Melhuish et al., 2015). Group size ratios differ considerably across Europe and are also dependent on the type of provision (e.g. centre-based ECEC provision often has larger groups than home-based provision).

Access and opening hours

Access and opening hours are two additional factors that contribute to the benefits that early childhood education and care can bring. For parents, for example, flexible opening hours can make the difference between being available for (full-time or part-time) work or not. Access to ECEC provision may have similar consequences. Moreover, parents' work–life balance will undoubtedly be influenced by these two variables. In a study covering California, MacGillvary and Lucia (2011) detect a shortage of ECEC provision that can accommodate the need for flexibility that parents have. First of all, there is a lack of available spaces in ECEC, given that in 2011 60% of children of ages 0-5 lived in families where all parents work, yet there were only places available in licensed childcare provision for about 27% of them. Only 6% of the places in licensed provision were available for infants, even though mothers with infants are as likely to be working as mothers of older children (Morrissey and Warner, 2007). MacGillvary and Lucia (2011) further note that 80% of the licensed provision did not offer care during non-standard hours (e.g. in the evenings or weekends).

In some of the EU Member States, children have a legal entitlement to participate in early childhood education and care, though substantial differences are detected not only as to whether this entitlement exists, but also how it is arranged (e.g. whether it depends on the age of the child or is entitlement to a limited number of hours). Ensuring that all children are legally entitled to access early childhood education and care could serve as a way to increase participation, though this is not necessarily sufficient. Other policy instruments, such as tax credits, cash benefits or other means of supporting families who struggle to pay for ECEC have proven their relevance (Cleveland and Krashinsky, 2003). Besides explicit financial support, policies that facilitate labour market participation are very important as well (e.g. parental leave systems and measures to support part-time work).

Type of service

In some EU regions, large proportions of early childhood care and education are provided by family day care. Selection, training requirements, supervision and monitoring of family day care widely varies across countries (Boogaard et al., 2014). Despite the growing and robust body of evidence on the importance of process quality in childcare for the youngest children, still little is known about variations in the quality of family day care (Fuller et al., 2004). Equally so, the complex relations between structural quality and process quality are far less researched in family childcare, compared with centre-based childcare (Ang et al., 2016; Raikes et al., 2005). Studies that include both home-based and centre-based childcare are extremely scarce. Since the seminal work of Kontos (1994), it is often assumed that the outcomes of children who regularly participate in family day care are below the outcomes of their peers who participate in centre-based care. However, more recent studies on this issue have produced inconsistent or even opposite results. Fuller and colleagues, for instance, focusing on services that serve poor families, did not find that centre-based childcare displayed more positive child–provider interactions than family childcare (Fuller et al., 2004). A recent study in Flanders found that family day care outperforms centre-based care on some dimensions of process quality, such as the well-being of children (Declercq et al., 2016).

4.3 Role of teachers and staff

In the academic literature, there is an overwhelming consensus that the staff working in early childhood education and care provision is a crucial factor in determining its quality (Early et al., 2007; Urban, et al., 2011; Urban et al., 2012). In this context, staff has a broad meaning and refers to teachers, assistants, other carers and management. In her study, Oberhuemer (2011) highlights that attention to ECEC staff has increased in recent years due to the growing attention to ECEC more generally and increased ECEC attendance. This development takes different shapes across the EU Member States, from raising the minimum qualification requirements applicable to the staff, to introducing specific professional profiles.

According to Urban et al. (2011), an ECEC system that can warrant the necessary quality consists of four interrelated domains of competences: individual competences, institutional competences, inter-institutional competences and governance competences. We will briefly highlight each level, in the light of state-of-the-art literature.

Individual competences: Training matters

At the level of individual competences, there is an abundance of studies that show associations between the formal levels of qualifications obtained by staff and the quality of ECEC services. Both cross-sectional and longitudinal studies converge to say that qualifications matter. Higher levels of preparation correlate positively with better childcare quality as well as with better developmental outcomes for children.[23] Specialised education for teaching staff seems to have a positive impact on both the children's outcomes and the competences of the ECEC staff (Litjens and Taguma, 2010). Moreover, the OECD's *Starting Strong* report (2006, p. 158) concludes:

> Research from many countries supports the view that quality in the early-childhood field requires adequate training and fair working conditions. Research shows the link between strong training and support of staff and the quality of ECEC services. In particular, staff who have more formal education and more specialised early-childhood training provide more stimulating, warm and supportive interactions with children.

[23] See Clarke-Stewart et al. (2002), Sylva et al. (2004), Early et al. (2007), and Fukkink and Lont (2007).

As a result, most international reviews[24] and policy documents (European Commission, 2005) recommend having at least one teacher or educator qualified at a bachelor level (ISCED 5) for each group of children. Depending on their specific role in the ECEC provision, in some Member States, staff members do not need to have any specific qualifications, while in others at least a bachelor's degree or a master's degree are expected (Urban et al., 2011).

However, it is not just a matter of pre-service training. While some EU countries have invested in graduate qualifications at bachelor and master levels, be it of different types (e.g. the Danish pedagogue, the Swedish teacher), other regions have invested in the development of interesting practices regarding the *accompagnement* or *accompagnamento* (coaching on the job) of workers at the secondary (often vocational) level (e.g. the cities of Pistoia, Reggio Emilia, San Miniato and Ghent and the work of ONE in the French Community of Belgium). The fact that some educators, already working in the field, might have missed out on the opportunity of receiving pre-service training needs to be acknowledged. In this sense, supporting educators by systematically providing opportunities for continual professional development becomes essential. In fact, in this regard, research shows that in-service training (on the job) may be equally important as pre-service (initial) qualifications, but only if it is of sufficient length and intensity (Fukkink and Lont, 2007; Jaegher et al., 2000; Pianta et al., 2008).

Institutional competences: Working conditions matter

Evidently, this does not mean that qualifications can be considered in isolation, or that the professionalisation of the workforce is in itself sufficient to predict the quality of provision. First, it is to be noted that educators with higher levels of qualifications tend to choose to work in areas already providing higher quality (Early et al., 2007). Equally important are the working conditions (Peeters et al., 2015). Indeed, when working conditions (including salaries) are insufficient, this leads to higher staff turnover, especially among higher-qualified staff, and this is detrimental to quality. Moreover, scholars (Kunneman, 2005; Oberhuemer, 2005; Vandenbroeck et al., 2016) warn us about a technical conceptualisation of competences and plead for a reflexive approach in order to be able to deal with the growing diversities in present-day societies (Urban, 2008). As a result, other, systemic conditions are equally important: "pedagogical support or guidance on the job is a necessary condition for professionals to be able to use the competences of their training in their job" (Early et al., 2007; Karila, 2008). Many researchers have specifically focused on in-service training and a consensus is apparent that in-service training positively influences quality, provided it is a minimal 20 hours per year (Clarke-Stewart et al., 2002; Fukkink and Lont, 2007).

As with qualifications, in-service training is only effective when it is accompanied by team meetings, supervision or other forms of coaching and on-the-job support (Gerber et al., 2007). Pedagogical advisers or *pedagogisti* can, for example, play an important role in increasing the professionalism of practitioners. One of the most salient conditions therefore, is that staff has paid child-free hours for the supervision to be fruitful (Peeters and Sharmahd, 2014). This is especially worth noting because in many countries qualified staff members are supported by assistants or auxiliary staff, who very often are not only unqualified, but also have little opportunity to participate in qualifying training (Van Laere et al., 2012).

Other aspects relate to teachers' salaries and career development. Both factors are important to attract and retain qualified staff and to encourage job satisfaction, work motivation, and quality (Moon and Burbank, 2004; Huntsman, 2008). Salaries, moreover, make up an important part of the costs associated with ECEC. Across the EU Member States, there is ample diversity in salaries (both the starting salaries and at later stages), which can be attributed to differences in the labour market conditions, the qualifications required of teachers and other factors. In the EU, starting salaries are among the highest in Denmark, Austria, Spain and the Netherlands, and lowest in Hungary, Poland and Greece, according to data from the OECD (OECD, 2016). During but also after the crisis, between 2010 and 2014, teacher

[24] See Cameron and Moss (2007), Eurydice (2009), Sylva et al. (2004) and Unicef Innocenti Research Centre, (2008).

salaries were frozen or reduced in a number of countries (OECD, 2017). Examples are Greece, Italy, Spain, Portugal and the UK. Especially in Greece, teachers' salaries were cut severely (by 30%). Besides their salary, teachers can rely on other benefits, including tax credits or free use of public transportations services in many Member States.

Inter-institutional competences

The fact that an increasing number of children live in vulnerable situations and that poverty is a wicked multifaceted issue calls for close collaboration between preschool provision and other social work and welfare organisations (Allen, 2003; Roets et al., 2016). Hence, many countries have initiated a countermovement of inter-organisational networking to fill gaps in welfare service provision arising from a lack of inter-organisational coordination, and to overcome deficiencies in the institutional division and distribution of welfare knowledge (Allen, 2003; Vandenbroeck and Lazzari, 2014). It is argued that inter-organisational networking across many different actors in service provision might generate and cluster the necessary knowledge and resources to provide a productive and progressive response to these so-called wicked issues (Allen, 2003; Provan and Lemaire, 2012). There are many examples where ECEC is integrated with other social and welfare services in order to be better equipped to combat inequalities: the Sure Start children's centres in England (Melhuish et al., 2008); the Réseaux d'Ecoute, d'Appui et d'Accompagnement in France (Roussille and Nosmas, 2004); the Familiencentren in Germany (Engelhardt, 2011); the Huizen van het Kind in Flanders (Vandeurzen, 2011); or the Family Centres in the Nordic countries (Kekkonen et al., 2012). In order to be fruitful, this collaboration and networking asks for specific competences of staff, of institutions and of governance (Oliver et al., 2010). Interestingly, a broad comparative study comparing areas with and without integrated services in England found that integration and cross-sectoral collaboration really made a substantial difference for vulnerable families (Melhuish et al., 2008).

Governance competences

Litjens (2014) clearly showed that monitoring quality had a positive impact on the quality of ECEC. In addition, a comparative study of EU countries (Van Lancker and Ghysels, 2016) shows that higher levels of government involvement and funding of provision are associated with more equal access to high-quality provision. More details on governance competences are presented in section 4.1.

4.4 Role of the parents and family background

Although the role of the parents in supporting early childhood education and care has been pointed out in some previous sections already, there are a few considerations that merit emphasising here. In human capital theory, one of the factors influencing the human capital acquisition of individuals is family characteristics (Becker, 1994; Chevalier et al., 2006). Already in 1966, the Coleman report found that the parental environment is the main determinant of children's academic achievement in the US, rather than expenditure on education or teacher-to-child ratios (Coleman, 1966). Becker (1994) also emphasised the influence of parents on their children in his work on human capital, pointing to their impact on knowledge, skills, values and habits. All these factors affect development and learning.

There has been research into genetic factors that may determine an individual's innate ability. This work has often used siblings (and especially twins) to assess the impact of genetics on educational attainment (e.g. Behrman and Rosenzweig, 2002; Björklund et al., 2004). From this work, it has become clear that while genetics are certainly an important factor that should not be overlooked, there are other family-related determinants that come into play as well. One factor is *education*: there is a clear, positive relationship between the education level of the parents, and especially the mothers, and their children (Chevalier et al., 2006). In addition, parents who are more educated attach higher value to the education of their children and are more involved in it, can assist them in their school work and are able to secure access to better-quality education (ibid.).

Heckman and Masterov (2004) present evidence on other factors, which are mostly related to *family structure and resources*, and confirm that poor family environments negatively affect child outcomes. For example, younger and less well-educated mothers are found to offer less emotional and cognitive stimulation to their children, which has an impact on their educational attainment. Similarly, test scores of children from low-income families are generally lower than those of high-income families, whereas the opposite holds for dropout rates and teenage pregnancies (Mayer, 1997). Other studies have focused on different determinants (e.g. one parent versus two parents, married versus unmarried), but all yield similar results (for further details, see Shonkoff and Phillips, 2000; Carneiro et al., 2005; Cunha et al., 2006). Becker (1994) stresses that initial differences between children proliferate over time and become wider with age and schooling. When disadvantaged children enter the labour market, it may already be too late or very expensive to intervene.

This evidence once again highlights the important role of ECEC for disadvantaged children, as it offers a way for them to catch up with those growing up in more favourable circumstances. As Heckman and Masterov (2004) and Cunha et al. (2006) have shown, early intervention, for example in the form of home visits or ECEC, is key to mitigate the effects of a disadvantaged background. Policy measures such as providing cash-benefits for disadvantaged college students prove to be far less effective. Heckman and Masterov (2004, p. 474) state that

> the real credit constraint facing children is not the lack of access to funds for tuition and room and board in the college-going years. Rather, it is the inability of children to borrow against future income to buy a parental environment that will allow them to fulfil their potential. It is the accident of birth.

In other words, interventions at a later stage in life are already too late to make up for the gap. This result is also illustrated in Figure 8 and Figure 9.

Given the important role that parents play, there is some research that looks into parental involvement and how it can advance child development and contribute to closing educational achievement gaps (see Barnard, 2004; Lee and Bowen, 2006; Hayakawa et al., 2013). Research shows that parental involvement in school activities as well as interventions focused on encouraging parental involvement are particularly successful in improving short-run outcomes (Barnard, 2004; Lee and Bowen, 2006; Reynolds et al., 2011; Hayakawa et al., 2013). In their work, Hayakawa et al. (2013) also consider long-run outcomes, with a specific focus on early parental involvement. Previous work had already detected a positive relationship between early parental involvement and pre-literacy skills (Arnold et al., 2008), on-time high school completion and educational attainment levels (Barnard, 2004), along with social behaviour, self-esteem and satisfaction (Wenk et al., 1994; Hayakawa et al., 2013), and a negative relationship between parental involvement and retention and special education enrolment rates (Miedel and Reynolds, 1999) and high school dropout rates (Barnard, 2004).

Hayakawa et al. (2013) use path analysis to explore the process of parental involvement that follows initial involvement in the early years (more specifically, in the CPC programme discussed above) and its impact. These authors find that this initial involvement as part of the ECEC programme stimulates later parental involvement through its impact on the child's achievements and motivation. More precisely, if children perform well in ECEC due to the beneficial impact of parental involvement, they are motivated to continue to perform well, which also triggers parents to continue their involvement – and this process is then repeated again and again. The findings from this study corroborate previous conclusions on the role of parents in ECEC and its link with child outcomes in the short and long run.

On the basis of a meta-analysis of 25 studies published during 1982–97, Fan and Chen (2001) conclude that parental involvement in school-related activities, such as participating in meetings with teachers or helping with homework, is a major determinant of a child's cognitive achievement. Later meta-analyses, such as those by Jeynes (2012) of 51 contributions published between 1964 and 2006, have confirmed the important effects of parental involvement on child outcomes.

Over the last years, the sociology of education as well as critical educational studies have substantially contributed to a better understanding of the productive, but also counterproductive role that parental involvement can play. In her seminal work, Lareau (1987) showed that the ways in which parent involvement was conceived matched with middle-class parents' expectations and therefore may contribute to widening the educational gap, rather than compensating for it. Since then, many studies have critically looked at parent participation in relation to inequality and cultural diversity (e.g. Dahlstedt, 2009; Van Laere and Vandenbroeck, 2017) as well as at how parent–teacher relations are moulded by curricular features. It is important to look at how reciprocity is fostered in parent–teacher relations that are fundamentally unequal (Vandenbroeck et al., 2009), so as to avoid that the ways in which parent participation is conceived privileges those families who are already privileged.

4.5 Concluding remarks

From this discussion of the conditions under which the potential benefits of ECEC can be obtained, one can derive that many factors affect the accessibility and quality of early childhood education and care. These factors exist at the micro, meso and macro level. Whereas policy-makers have control over some of these factors, others are more difficult to influence. For this reason, many counties have introduced minimum standards and guidelines as well as monitoring systems to ensure that they are met. While the importance of monitoring is recognised for most domains, questions are raised as regards the monitoring of child development, especially when standardised, formal testing is used. The important role of the conditions or determinants affecting the potential benefits of ECEC is also illustrated in Figure 10 in the previous section.

5. Conclusions and policy recommendations

In this report, we have examined the benefits of early childhood education and care and the conditions under which they can be obtained. Small children obviously receive care and even a measure of education under any setting including parental care, but this report is concerned with the benefits of formal care. It uses the European Commission's definition of early childhood education and care as provision for children from birth through to compulsory and primary education that falls within a national regulatory framework. This definition covers both the relevant time period and the formalised nature of early childhood education and care.

The raison d'être for this report comes from several directions.

First of all, the provision of early childhood education and care is growing. The average length of education (measured in numbers of years) is increasing, and so is the interest in early intervention in children's lives, particularly for those facing social exclusion.

Second, the quantitative increase is accompanied by increasing expectations of the effects of ECEC on individual and societal well-being. This report has demonstrated a wide range of impacts – from those on education and labour market outcomes to health and criminal justice.

Third, it is not obvious how to achieve these effects. This is due to a great variety of models of provision coupled with the difficulty of precisely measuring the effects of ECEC. Specifically, Member States have both integrated systems where ECEC is united in a single institutional setting, and split systems, where responsibility for the care of children in different age groups is divided among different levels of government. While centre-based care is prevalent, home-based care is also present in a number of countries. There is particular diversity among Member States with regard to the public/private split in provision – much more than in the case of primary or secondary education. This is linked to different rules on access and the role of government – ranging, to demonstrate the extremes, from free and universal to paid and demand-based provision.

The EU has entered this policy arena most forcefully through objectives set in 2002 by the Barcelona European Council – to provide childcare, by 2010, to at least 90% of children aged between 3 and the mandatory school age, and at least 33% of children under 3 years of age. Only a minority of Member States has achieved both objectives and several Member States have not reached either one. More broadly, there has not yet been convergence in either models or outputs and outcomes.

More ECEC provision and participation, high expectations, and diversity of models are thus powerful reasons to investigate arguments on whether to invest in early childhood education and care, and under what conditions such investment can bring the most benefits.

The basic conceptual argument for the extensive benefits from early childhood care and education comes from the cumulative nature of education as well as the higher neuroplasticity of children during the pre-school age. If children are more malleable at this stage and if later education builds on achievements of a previous stage, then it is obvious – at a conceptual level – that ECEC should bring greater benefits than subsequent educational interventions. By the same token, children from less stimulating environments, who receive less investment under the alternative scenario of strictly parental or informal care should benefit more from the access to formal and high quality care.

While the basic conceptual argument is elegant and intuitive, it has been quite challenging to empirically fully validate it for three reasons. First of all, the possible positive effects touch upon a variety of areas – education, employment, inclusion, health, crime, even well-being and citizenship. Second, there is only a very small number of studies following the children during the whole life course and, by default, such studies primarily reflect ECEC provision existing decades ago. For shorter periods, the findings are more numerous and robust, but there is a question of whether they persist over a lifetime and are not

attenuated by other influences. Third, there is an interest in measuring how a broader set of inputs (not just the binary issue of participation/non-participation in ECEC, but also length of time and quality) influence subsequent outcomes. Fourth, it is not easy to capture the causal effects of ECEC, as opposed to simple correlations. Some studies have aimed to address these issues, e.g. by using randomised control trials or quasi-experimental methods.

These challenges have not been fully overcome, but given the increasing prominence of research focusing on the topic, the high number as well as quality of research strengthens our confidence in drawing conclusions. Available research shows that the overall cost–benefit ratio from ECEC investment is positive and conducive to further investment in it, but this conclusion very much depends on the country of analysis and, in some cases, even on a study, supporting the argument that *how* early childhood education and care is provided matters as much as *whether* it is provided.

This report has surveyed research from the UK (including Northern Ireland), Sweden, Norway and Italy showing that participation in early childhood education and care had a significant, positive impact on children's subsequent outcomes, chiefly within the education system. These effects were typically higher for more-at-risk children, usually from families with lower education, income or migrants. The German studies were more ambiguous, though the preponderance of evidence has been in the same direction. By contrast, studies conducted in Denmark, France and the Netherlands pointed more to the role of family characteristics and, controlling for that, did not demonstrate significant effects of ECEC on subsequent outcomes.

While all these studies were longitudinal, the length of time during which they were able to observe children varied significantly and rarely extended into adulthood. Therefore, while the overall evidence is fairly robust, the robustness declines somewhat if the research question extends over the life course.

In terms of specific benefits, the literature emphasises in particular the impact on education and skills, labour market outcomes, poverty and social inclusion, health and crime. These effects can be measured not only in the lives of those who attended ECEC, but also for their parents, other family members and broader society.

Specifically, there is extensive and robust evidence on the positive effects of ECEC on children's cognitive and non-cognitive development and educational outcomes. This effect even extends to subsequent generations according to some studies. This positive effect is accompanied by financial savings for governments due to less class repetition, less need for special education and lower dropout rates.

Extensive evidence also exists that participation in early childhood education and care improves labour market status not just of parents, but also of the children themselves later on. This has been linked to higher tax revenues and lower welfare dependency, leading to fiscal savings.

Unsurprisingly, better education and labour market outcomes for parents and children are associated with better health status and this can also be reproduced across generations. Similar effects have been shown for crime and anti-social activity.

The potential benefits of early childhood education and care are thus far-reaching, both in terms of scope as well as in terms of their target group, and have been researched in different disciplines, on the basis of a variety of indicators. In Table 2, a summary of the main findings on the potential benefits of early childhood education and care is presented, broken down by group and type of impact.

Despite the evidence presented above, it is important to recall that it is difficult to quantify the benefits of ECEC and to establish causality. Especially in the European case, longitudinal evidence is not always available (or only up to an early age, which allows to capture mainly educational outcomes). While there is more evidence for the US case, differences in the programme designs, institutional context, evaluation

methods and a range of other variables make it difficult to compare both cases and imply that the external validity of US evidence may be limited in the EU context.

Table 2. Evidence on the main benefits of ECEC, by group and type of impact

	Children	Parents	Government and society
Education/cognitive and non-cognitive	Higher achievement and improved development Reduced grade retention Less time spent in special education or additional courses Higher education completion rates Improved well-being	Opportunity to continue their own education	Better-educated workforce Reduced spending on some education-related measures
Labour market	Improved employability Higher wages and non-wage remuneration	Increased labour market participation (especially mothers) Higher earnings	Less unemployment Higher tax revenues Less expenditure on welfare and other types of benefits
Poverty/ inclusion	Reduced risk of poverty and inequality Improved inclusion	Reduced risk of poverty	Less poverty Lower inequality More social cohesion
Health	Improved health outcomes	Improved health outcomes	Less expenditure on health-related policies
Criminal justice	Lower incidence of abuse and criminal behaviour Less time spent in prison	Lower incidence of criminal behaviour	Reduced spending on criminal justice system
Other	More support	More support from other parents and professionals	

Source: Own elaboration based on results presented in this report.

The report has demonstrated that there are four basic groups of policy levers that policy-makers can pull: personnel, organisation, curriculum and generosity of funding. As with other social policies, there are trade-offs and dilemmas in achieving different policy objectives, such as equity, efficiency and effectiveness. For early childhood education and care, the issues of access and quality in particular are both crucial and highly complex. For example, in many countries, there is not only unequal access to ECEC in general, but also even more unequal access to high-quality ECEC, further exacerbating inequalities.

Another illustration of the complexities is that while high educational quality of ECEC is especially beneficial for children from poorer and disadvantaged backgrounds, a more challenging, education-focused ECEC is also more likely to discourage parents from such backgrounds from placing their children in ECEC at all. Although there is a general presumption that the close involvement of parents is beneficial, research points out that this is likely to reflect middle-class parents' views on appropriate involvement and can actually reinforce inequalities.

Third, it has been demonstrated that those jurisdictions with universal provision and where ECEC is a legal entitlement have the most equal enrolment rates. At the same time, marketisation and commodification seem to go hand in hand with increasing inequalities, even when compensated by a voucher system for parents in need.

While the organisation of and responsibilities for ECEC can be allocated to different levels of government, there is a need for central involvement at least in some of the key areas, such as setting the curriculum and personnel standards. The quality of both caregivers and their supervisors – influenced

through selection, in-service training and supervision – is of paramount importance. Additionally, achieving universal provision and even legal entitlement can be considered, but their fiscal implications as well as suitability for the governance frameworks of a particular country cannot be ignored.

Looking at the potential EU role – in addition to the Barcelona Council objectives and their follow-up – it is worth noting that while there has been an impressive growth in knowledge about the costs and benefits of ECEC, there is a need for further data collection, analysis and evaluation, owing to the complexity of causal chains and diversity of national systems. This should be done not only on a national, but also on a comparative basis – something that is unlikely to happen without more extensive involvement by supranational institutions. The same logic applies to the collection and dissemination of good practice, potentially leading to the formulation of minimum standards.

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