Publication 8

Preventive, intervention and compensatory measures aimed at reducing early school leaving: Exploring the possibilities of performing a cost-benefit analysis

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Glossary of abbreviations and terms

AT – Austria

BE – Belgium

CBA – Cost-Benefit Analysis

CEA – Cost-Effectiveness Analysis

ECEC – Early Childhood Education and Care

ES – Spain

ESL – Early School Leaving

EU – European Union

FL – Flanders

HU – Hungary

Macro-level factors – Factors on the level of societal structures; the educational system level, economic and political context …

Meso-level factors – Factors on the institutional level; the school, family, neighbourhood …

Micro-level factors – Factors on the individual level; attitudes, beliefs, behaviour …

NL – The Netherlands

PISA – Programme for International Student Assessment

PIRLS – Progress in International Reading Literacy Study

PL – Poland

PT – Portugal

RESL.eu – Reducing Early School Leaving in Europe research project

SE – Sweden

TIMSS – Trends in International Mathematics and Science Study

UK – United Kingdom

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About the RESL.eu project

The RESL.eu project aims to provide insights into the factors and processes influencing students to withdraw from education or training before its completion. In addition, the project intends to identify and analyse preventive, intervention and compensatory measures that aim to keep pupils in education or training until they attain at least an upper secondary education qualification. Its aim lies in the development of generic conceptual models based on research to predict and tackle early school leaving (ESL), and ultimately, to share these insights with various target audiences at the local, national and EU level.

The project focuses on the development and implementation of education policies, and the transferability of country-specific good practices. RESL.eu also seeks to understand the mechanisms behind, processes leading to and trajectories following ESL by examining the actions, perceptions and discourses of all youngsters (both those who are early school leavers and those who are not) as well as those of their significant others (family, peer group, school staff). The project builds on existing practices to tackle ESL and intends to develop innovative approaches for regular schools and in alternative learning arenas.

How and where the project operates

In nine EU member states (Belgium, the United Kingdom, Sweden, Portugal, the Netherlands, Poland, Spain, Hungary and Austria), two local urban research areas were involved in a comparative policy analysis of ESL policies on the EU, national/regional and local levels.

New survey data were collected in two waves among at least 1,500 youngsters in each country across two different urban research areas (except in Hungary and Austria). In each country, school staff and school administrators were also surveyed.

Qualitative data were collected across seven member states (Belgium, the United Kingdom, Sweden, Portugal, the Netherlands, Poland, and Spain). At least two biographical-interviews were conducted with 24–32 youngsters per country. In-depth interviews and focus group discussions with students and staff also took place across 28 schools and 24 alternative learning arenas that were carefully selected based on the first wave of the students' survey data and the field descriptions of local educational landscapes.

Executive Summary

Position and main research question of the paper

This report presents Publication 8 of the RESL.eu project on early school leaving in the EU. It is part of a longer series of project papers and publications presenting the research findings gathered in packages one to six. The current paper is linked to work package seven (WP7), which similar to work packages five (WP5) and six (WP6), takes a normative, forward-looking perspective on the issue of early school leaving. Whereas WP5 bundles the results obtained in the descriptive (WP1-2) and the analytical (WP3-4) work packages and WP6 formulates policy recommendations, WP7 explores the possibilities of using cost-benefit analysis as an instrument to evaluate measures prior to their adoption or later on (when deciding to keep a measure in place).

Within this publication, the focus is on the costs and benefits associated with preventive, intervention and compensatory measures of early school leaving examined in RESL.eu. It explores possibilities of performing a cost-benefit analysis within the context of the RESL.eu project. Cost-benefit analysis is a methodology that is commonly used to inform decision-making, either before a measure or policy is adopted or, at a later stage, to evaluate whether it is worth continuing. The rationale for exploring the possibilities of doing a cost-benefit analysis here is that early school leaving has become a policy priority, in light of the Europe 2020 benchmark. Informing researchers on how to proceed with a cost-benefit analysis with a view to formulate policy recommendations is, therefore, a valuable exercise. The aim of the report was to clarify how researchers could approach cost-benefit analysis in the early school leaving context, not to perform such an analysis. Despite the rich data collected in RESL.eu, a substantial amount of data that would be needed for a cost-benefit analysis is missing. Moreover, even if such data would be available, performing a cost-benefit analysis would remain a highly complicated task that would exceed the remit of this project. Therefore, the report's aim is to equip researchers and policy-makers with the knowledge needed to do so.

To this end, the paper presents a thorough overview of what cost-benefit analysis entails, the different types of costs and benefits and how they can be quantified, and the challenges and caveats of such an analysis. Attention is devoted to costs and benefits at different levels, such as individual and societal, at different times, in the short run and the long run, and in different domains, from education and labour markets to health and crime.

Methodology and data

As part of the normative element of the project, this paper relies heavily on research, data and findings that have been collected in earlier stages of the RESL.eu project. Taking this evidence as a starting point, this paper complements this base with literature on cost-benefit analysis and its application to education and early school leaving. Because the idea of using cost-benefit analysis in the context of early school leaving has mostly been pursued by economists working on these topics, much of the literature cited originates from the field of economics of education. For that reason, any terminology that is specific to this literature is explained throughout the text. In addition to this terminology, the paper follows the conceptualisation and definitions put forward in the RESL.eu project. As in previous research outputs of the project, this paper takes a comparative perspective to the maximum extent possible. In this report, this comparative angle was introduced by grouping together several measures in the discussion of different types of costs and benefits.

Within the RESL.eu project, a large number of preventive, intervention and compensatory measures was studied in nine countries. In this report, only a subset of these measures was selected for further analysis, namely two measures for each country that took part in the data collection exercise. In the selection of measures, specific attention was devoted to the different types of costs and benefits that could be associated with the measures, so to end up with a good mix of measures that would point out diversities and similarities. This would then allow us to identify potential costs and benefits and suggest how they could be compared, should one be interested in conducting such an exercise in a future research project.

Main findings

From the literature reviewed in the preparation of this report, it is clear that cost-benefit analysis can be a valuable instrument to reflect on the adoption or continuation of one or more policy measures. In the field of education, and even in relation to early school leaving, cost-benefit analysis has been used in a number of studies. Most research, however, focused on one specific measure or case, or it was limited in time or scope. Some studies only addressed the cost side, which is generally due to the fact that benefits are more difficult to quantify than costs and data on benefits are harder to collect than data on costs, as benefits tend to materialise much later (these issues may also lead to an underestimation of the benefits and bias the outcomes of the cost-benefit analysis). These difficulties would emerge in any cost-benefit analysis of measures aiming to reduce early school leaving, within and outside of the RESL.eu project.

Although the literature confirms that cost-benefit analysis can be useful in the context of early school leaving, the methodological complexity and the lack of available data, in terms of the topics, levels and timeframes considered, make it very difficult to apply cost-benefit analysis. Collecting these data retrospectively is nearly impossible, which implies that the research design and data collection strategy have to be established with cost-benefit analysis in mind. Moreover, it may be difficult to anticipate what data would be required, which again complicates the analysis. One option is to perform a cost-benefit analysis with a more limited scope or purpose. An alternative is to complement this work with other analysis tools, which may be less demanding in terms of data requirements, or to apply a different strategy altogether. Notwithstanding these challenges, cost-benefit analysis could be an interesting instrument for gaining insights into whether a measure aimed at reducing early school leaving merits consideration.

1. Introduction

With the adoption of the Europe 2020 strategy in 2010, decreasing the rates of early school leaving (ESL)[1] has become a priority for policy-makers in the European Union (EU). In the Europe 2020 strategy, which is the European Union's agenda aiming to achieve "*smart, sustainable and inclusive growth*", reducing the share of early school leavers to below 10% is one of the headline targets. This objective is one of two targets pertaining to education, along with increasing to at least 40% the share of people aged 30-34 to have completed higher education by 2020.

This focus on early school leaving is motivated by the consequences entailed by early school leaving, which affect the individual as well as society. ESL is associated with higher unemployment and poverty rates, a higher risk of social exclusion and taking part in criminal activities, and poor health for the individual (Brunello and De Paola, 2014). At the societal level, it is linked to increased expenditure and less tax revenues, in addition to declining social outcomes (Brunello and De Paola, 2014). The counterpart of the costs linked to early school leaving are the benefits of completing education. Indeed, there is ample academic research that points out that increased educational attainment leads to higher earnings, improved employability, longer life expectancy, better health, reduced criminal behaviour, increased tax revenues, lower spending on welfare benefits, among other benefits. Many of the benefits of an increased educational attainment are non-pecuniary (Oreopoulos and Salvanes, 2009; 2011).

In 2010, when the Europe 2020 strategy was implemented, the share of early school leavers aged 18-24 stood at 13.9% in the EU.[2] Since then, much progress has been made towards the target of 10%. According to the most recent Eurostat data, the rate of ESL amounted to 10.7% in the EU28 in 2016 and it is expected that by 2020 the 10% rate will be achieved. These aggregated numbers, however, conceal substantial heterogeneity in ESL rates across the Member States. Of the nine countries covered in the RESL.eu project, Eurostat data show that three had rates that were already below the 10% level in 2010, namely Austria (AT), Poland (PL) and Sweden (SE), and three were already quite close to reaching this cut-off – (Belgium (BE), Hungary (HU) and the Netherlands (NL). The three remaining countries, Portugal (PT), Spain (ES) and the United Kingdom (UK), showed higher ESL rates (especially Spain and Portugal, with an ESL rate of close to 28% in 2010). In 2016, only four of the nine countries had not yet reached the target (Hungary, Spain, Portugal[3] and the

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[1] In the RESL.eu project, early school leavers are defined as those individuals between 18 and 24 years-old leaving education without having attained an ISCED III-level qualification.

[2] These data were obtained from Eurostat and refer to the share of early school leavers as defined by the European Commission and Eurostat. According to their definition, an early school leaver is an individual of age 18 to 24 years old who has attained at most lower secondary education and is not engaged in education or training. ESL is not to be confused with NEET, which represents young individuals who are neither in employment, education or training.

[3] Note that for Portugal it is important to point to the efforts of the government in reducing early school leaving, even though the target has not been received. The decrease in the ESL rates is substantial, from 28.3% in 2010 to 14% in 2016.

UK). The other five countries have set national targets that are more ambitious than the 10%, while Spain has put an ESL rate of 15% as its national target.[4]

In order to account for this heterogeneity in the Member States' starting point, a closer look at the national educational, policy and institutional framework is needed. Within the context of RESL.eu, all project partners have put forward a conceptualisation that captures the specificities of their ESL-related challenges and approaches (see Project Paper 1 for more details). A project-wide working definition has also been suggested: ESL implies leaving education un(der)qualified; it captures all young people who left secondary education without attaining a degree/certificate of upper secondary education or similar, equivalent to an ISCED III level. In the remainder of this document, ESL will be understood as outlined in this definition.

Despite the progress that has been made in tackling the issue of early school leaving, it remains a major challenge in the European Union, precisely because of the impact it may have. Especially in a context of upskilling in the labour market and high yet declining unemployment rates, it is still important to have a degree to enter the labour market (Beblavý et al., 2016). For this reason, it is essential to ensure that all students leave secondary education with qualifications.

Against this background, EU policymakers must ask themselves the following questions: How can early school leaving be addressed? What measures can be adopted to reduce early school leaving (or, in other words, what policy measures are effective; what measures work)? And, what measures are efficient (or, in other words, what measures contribute to reducing early school leaving with the least waste of time, resources or effort)? Both questions are important, considering that education policies involve a high amount of government resources, which are constrained in light of the recent economic crisis. During the crisis itself, government budgets for education policies were cut in several EU Member States. In all Member States, the public sector is the main actor in the education field (although often in combination with the private sector). National governments, therefore, need information on where their scarce resources can have the largest impact. Such an assessment can be made by means of a cost-benefit analysis (CBA).

Cost-benefit analysis is a technique that is widely used in economics and business to inform decision-making on one or more options, in this case policy measures. It involves the quantification and comparison of all costs and benefits associated with the options under consideration. For example, a cost-benefit analysis can be conducted to compare two policy measures, with a view to selecting the most effective or efficient one. Cost-benefit analysis can also be used to examine whether it is worth continuing a measure or strategy. For example, after a measure had run for a number of years, its costs and benefits could be evaluated to determine whether it should remain in place. As public funds are involved in education and in the fight against early school leaving, a cost-benefit analysis could advise policymakers whether policies should be continued, adapted or replaced.

Cost-benefit analysis has a broad application. In education, it has been used to assess the value of additional education or training. For example, there is an extensive literature base on the impact of an additional year of education on labour market outcomes, comparing the costs of this additional

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[4] National targets are identified in the National Reform Programme reports, which are published every year to monitor the progress that countries are making in a number of domains, including the Europe 2020 strategy targets.

year to the individual and society with the benefits it brings in the short and long run (e.g. Mincer, 1974; Woodhall et al., 2004). In relation to early school leaving, the costs have been discussed in previous literature as well (Belfield and Levin, 2007; Belfield, 2008). As regards the benefits, there is ample research on the advantages of having a degree (Wolfe and Haveman, 2001; Corak et al., 2003).

This paper explores the possibilities of performing a cost-benefit analysis of a set of preventive, intervention and compensatory measures addressing early school leaving that were examined in the RESL.eu project. It focuses on 14 measures, which are only a subset of the large number of preventive, intervention and compensatory measures that were studied within the project. Yet the actual cost-benefit analysis was not performed; due to the high number of measures studied, the lack of data (particularly macro-level and longitudinal), the very complex nature of ESL, the methodological complexities and other reasons. Such an exercise would require a tremendous effort and, therefore, is beyond the scope of RESL.eu. Instead, this paper seeks to analyse what would be needed to carry out a cost-benefit analysis in a future project on early school leaving based on the findings of the RESL.eu project.

To this end, the paper combines the data and research from the RESL.eu project with insights from the literature. It explores the costs and benefits related to a subset of policy measures studied in the project, one preventive or intervention and one compensatory for each of the research areas. For each measure, the paper reports on the data that are available and those that would be needed, and reflects on the methodological challenges pertaining to each of them. The paper builds on the EU policy framework as well as on the theoretical and methodological framework established in the RESL.eu project, taking into account the factors that may influence a student's decision to leave school early.

On the basis of the research conducted for this paper, it is clear that cost-benefit analysis could be a valuable instrument for assessing whether a specific measure aimed at tackling early school leaving is effective and efficient, in comparison to alternative measures. At the same time, conducting this type of analysis is a very challenging task, which requires a large amount of data covering different domains over time. Moreover, quantifying the benefits resulting from policy measures is not straightforward for a variety of reasons (e.g. discounting, long-run effects, etc.). To overcome these issues, careful planning of the data collection process must be completed prior to its execution. Moreover, the objectives of the measure and the focus of the CBA need to be carefully defined.

The remainder of this paper is organised as follows. Section 2 discusses the methodological approach taken in the preparation of this report. The report continues in section 3 with an extensive overview of cost-benefit analysis and its application to the field of education and to early school leaving. Considerable attention was given to preparing this part of the paper, as it is imperative to have a thorough understanding of cost-benefit analysis in order to be able to apply this technique in a later exercise. The lessons from the literature for the RESL.eu project are then summarised in section 4, after which they are applied to a subset of 14 measures. It should be noted that only a short overview of the selected measures is presented in this paper; for more information, please refer to Project Papers 4, 5 and 6 of the RESL.eu project. The final section 5 presents a discussion and conclusion of the main findings of this report.

2. Methodology

Before delving into cost-benefit analysis and its application to the RESL.eu project, this section first discusses the methodological approach taken in the preparation of this report. This section explains the relationship of this report to the other project papers, highlights some of the challenges faced in preparing this paper and how they can be overcome, but also provides a rationale for the selection of the policy measures for further analysis.

This paper is devoted to exploring the possibilities of conducting cost-benefit analyses of early school leaving and the measures addressing it. It takes the earlier findings of the RESL.eu project as a starting point, and completes them with insights from the literature (most notably the academic and policy-oriented research on cost-benefit analysis and supporting methodologies, the application of these findings to the field of the economics of education and ESL). Specifically, this report builds on Project Papers 6 and 7 and their annexes, which include overviews and categorisation of all case studies, and information on how to contextualise them in different education systems. The publication also relies on the country reports and other publications. No additional fieldwork was needed.

In RESL.eu, an extensive range of preventive, intervention and compensatory measures aimed at addressing the issue of early school leaving were identified and analysed. Prevention measures aim to deal with ESL before the first symptoms become visible, whereas intervention measures are those that are set in motion when the first issues have started to emerge. For both, the focus is on school-based measures, which may involve external partners. Compensatory measures are implemented outside of regular secondary school, but all leading to an educational qualification.

Following the same approach as other RESL.eu publications, we distinguish between these three types of measures. More specifically, we separate preventive and intervention measures into one group, and compensatory measures into another, and examine one of each group for each country. This approach allows us to not only uncover how different types of measures compare in terms of benefits and costs, but also how similar measures differ across countries, institutions and cases. Making this distinction between these measures is also relevant, precisely because of their organisation inside and outside of regular secondary education. Whether a measure is implemented within or outside the mainstream system may have an impact on the costs and benefits involved, for example when existing materials or infrastructure can be used in the former case but not in the latter. Moreover, related costs and benefits may vary across countries, due to the different relationships between the measures across countries.

Within the project, information is collected on the factors influencing ESL on the macro-, meso- and micro-level. Macro-level factors refer to the level of societal structures (e.g. the political context or education system); meso-level factors exist at the institutional level (e.g. school, family); micro-level factors are those found at the individual level (e.g. behaviour, attitudes). Owing to the project's scope, however, mostly micro- and meso-level data were gathered. Fewer macro-level data have been assembled, given the complexity of the factors that could affect the processes leading to ESL.

2.1 Selection of Preventive, Intervention and Compensatory Measures

The RESL.eu project has examined an extensive range of preventive, intervention and compensatory measures aimed at addressing ESL that have been introduced in the nine countries studied (for more details, please refer to the full list of project outputs in the bibliography). Since multiple preventive, intervention and compensatory measures were assessed in each country, a subset of measures was chosen for further exploration. Only a subset of policy measures is used because cost-benefit analysis is comprehensive in scope and requires a substantial amount of data. While it is already a challenge to identify the potential benefits and costs of one measure, doing so for all measures examined in the RESL.eu project would imply a tremendous effort. That being said, some of these policy measures are likely to have common features, which facilitates the CBA and comparison (this point will be further clarified below) In order to make the exercise more manageable, but also more accessible for the reader, a subset of preventive, intervention and compensatory measures was chosen to illustrate the potential of performing a cost-benefit analysis.

The selection of the 14 preventive, intervention and compensatory measures for further evaluation was based on a range of criteria. Similar to other papers of the RESL.eu project, the aim was not to choose the measures that are representative of a specific country or type of measure, but rather to identify those measures that best meet the purposes of our exercise. For that reason, the selection was based on the measure's characteristics, including the types of costs and benefits related to the measure, the ease of identifying these costs and benefits, the available data on the measure and its impact and whether the measure is subject to modifications and has been previously evaluated, among others. This selection did not favour measures that are relatively 'easy' to study over others, precisely because the scope of the report was to reflect on the possibilities of doing a cost-benefit analysis. For that reason, a combination of measures on which different degrees of information is available was chosen for further analysis. It should be noted, however, that cost-benefit analysis is only one tool among many that policy-makers can use in determining which measures to implement. For measures whose costs and/or benefits are more difficult to quantify, it would be useful to also consider other techniques in making a decision.

This approach implies choosing a variety of measures, some of which might be sufficiently similar to allow for comparative research. In this regard, similarities can, for example, be found in the scope, objectives, design or implementation of the measures. While it is clear that comparing the measures is not straightforward, this paper was prepared with a comparative perspective in mind, as one of the main goals of the RESL.eu project is to produce a comparison that takes into account the different educational structures and local conditions. All project partners have collected and processed data on the measures using the same methods and analysed results in a similar way. This ensures the internal consistency and contributes to the comparability of the findings.

While the "success" of a programme was also carefully considered, the final selection better reflects programmes with certain thematic similarities – rather than those that were reported to be more successful.[5] This choice is motivated by the fact that not all policy measures discussed in the

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[5] Here, "success" is understood as the extent to which a measure is able to meet its target. For example, if a measure aims to reduce early school leaving, it can be seen as successful if this is indeed the result. This is, however, difficult to establish empirically. Moreover, success can only be evaluated if the target of the measure and its results are clear. Even then, making a judgement on the success of the measure is difficult. For example, if a measure is aiming to reduce ESL by 5%

RESL.eu project have already been evaluated (and, thus, information on the results for all measures is not available), which would imply that measures could be excluded by default or that different selection criteria would be used for different measures. In addition, defining "success" is not a straightforward task, as this depends heavily on the criteria taken into consideration. For example, one could consider the extent to which a measure achieves what it intended to do. Another approach, which may very well lead to a different conclusion, would be to assess whether the measure achieves this result in a cost-effective way (by using a cost-effectiveness or cost-benefit analysis). Another point is that policy measures often do not come with a specific target that can be measured (Brunello and De Paola, 2014). For example, a measure can be adopted with the aim to reduce ESL, but there may not be a specific target when it comes to how large this reduction should be.

Given that cost-benefit analysis is a data-intensive exercise, data availability is also considered, as was indicated above. This refers to the costs and benefits of a measure, both in the short run and in the longer run. More specifically, general information and specifics about the measure and further background information on the institution and respondents are needed. In RESL.eu, data collection focused especially on the micro- and meso-level. Note that not all countries examined in RESL.eu will be discussed in this paper. Austria and Hungary are not considered, because neither of these countries took part in the data collection.

An initial selection of seven preventive and intervention and seven compensatory measures was prepared and presented to all consortium partners. Partners were asked for feedback on the selection, not only considering the two measures suggested for their country but also accounting for the other measures that have been proposed. After reviewing the initial selection, two of the preventive and intervention measures were replaced by another measure, mainly due to data availability issues (these measures were the Spanish measure and the Portuguese measure). The subset of measures that was chosen for further analysis are presented in Table 1 (which introduces the seven preventive and intervention measures) and Table 2 (introducing the seven compensatory measures). Note that in both tables, the name of the measures is mentioned, together with a very short description of the measure itself. Further information is presented in section 4.1 (under headings 4.1.1 and 4.1.2).

For the preventive and intervention measures, the focus is on **care and inclusion** (these are presented in Table 1). For the compensatory measures, the focus is on **vocational training** (presented in Table 2). The 14 selected measures largely fall within one of these two categories, but nevertheless utilise different, and at times even polar-opposite approaches. In our view, this allows for an interesting mix of policy measures, which can be compared and contrasted in multiple ways.

With these measures in hand, this report will first explain what a cost-benefit analysis is and how it can be applied to the phenomenon of early school leaving, and then apply these principles to the RESL.eu project using the 14 selected measures to illustrate how different types of costs and benefits could be identified, quantified and compared.

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and the reduction is only 3%, does this mean that the measure was failure? To avoid having to make subjective judgements, success was not considered a criterion.

Table 1: Selected preventive and intervention measures

Country	Institution	Measure
BE (FL)	A	**Student Counselling and Socio-emotional Support**: a school-wide and student-focused measure that provides a supportive school environment with one-on-one interactions
ES	A	**Orientation**: a school-wide measure in which students are informed on their future career options
NL	A	**Care Structure**: a preventive measure focused on students dealing with issues outside of the school context
PL	C	**Integrated/Inclusive Nature of the School**: a school-wide measure that provides students with an inclusive environment
PT	A2	**Educational Class Advisor**: a preventive measure that assigns a class advisor with whom students can discuss issues
SE	D	**Individual Alternative**: a preventive measure that provides a coach and enables learning in small groups
UK	A	**Inclusion Team**: a measure that focuses on youth-at-risk combining various practices

Note: Institutions are listed to connect this report to the other publications of the RESL.eu project.
Source: Own elaboration, based on measures examined in the RESL.eu project.

Table 2: Selected compensatory measures

Country	Institution	Measure
BE (FL)	A	**Modular System**: a measure offering second-chance education which is set up in a modular, flexible way
ES	A	**JPO**: a measure that provides basic vocational training, guidance and support, as well as internships with partner companies
NL	A	**Talent for Care**: a measure that focuses on providing basic qualifications, combining school- and work-based education
PL	A	**Alternative Vocational Education Programme**: a measure that focuses on education in math and Polish language skills for very troubled youth
PT	D	**Apprenticeship with Labour Insertion Guarantee**: a measure that combines certification with full-time employment opportunities

| SE | A | **Vocational Training Course**: a measure offering vocational education to those who left school with a diploma |
| UK | A | **Bridging Course**: a measure that provides a full set of qualifications to youngsters who had their education interrupted |

Note: Institutions are listed to connect this report to the other publications of the RESL.eu project.
Source: Own elaboration, based on measures examined in the RESL.eu project.

3. Cost-benefit analysis and its use in the field of education

Cost-benefit analysis can contribute to policy-making by providing information on the costs and benefits of different policy measures. Especially when several policy options are available, as is often the case with education policy, cost-benefit analysis can be a helpful tool to support rational decision-making, in that way maximising utility (Mill, 1879). At first, cost-benefit analysis was mainly used in the world of business, as an instrument to help decide whether or not to proceed with an investment. Later on, cost-benefit analysis also became used in the context of public investment.

Also, cost-benefit analysis can be applied in the context of early school leaving. Since 2010, ESL is high on the agenda of policy-makers in the European Union. This focus on ESL is motivated not only by the significant costs of early school leaving, but also by the considerable benefits associated with completing or continuing education. In addition, the issue of early school leaving cannot be detached from the broader economic context and labour market situation. In 2010, the EU was still facing a severe economic crisis, with unemployment rates for young people reaching record highs. In such circumstances, those without a secondary education degree or certificate (or equivalent) have special difficulties to enter the labour market, and may have to compete with those with higher levels of educational attainment for the same position. Moreover, although the EU's labour markets are now showing the first signs of recovery, education remains one of the main criteria that employers use to select job applicants (see e.g. Beblavý et al., 2016).

What policies measures can be implemented to reduce early school leaving? Considering that ESL is a complex issue that results from a long process in which multiple factors interact, policy-makers can implement a range of measures to work towards this goal (preventive, intervention and compensatory measures such as early warning signs). Because education is a national (or even regional) competence, there is a lot of diversity across the EU in terms of the institutional framework, the education system, the prevalence of early school leaving and the policies in place. Member States can, nevertheless, learn from the good practices of others. A final point is that early school leavers are a heterogeneous group of students, with different reasons for leaving school early. This means that some measures may be very effective for one group of students, but ineffective for another group. Research suggests that a comprehensive strategy to tackle early school leaving would involve a combination of preventive, intervention and compensatory measures (Council Recommendation, 2011; Thematic Working Group on Early School Leaving, 2013).

With this diversity of available measures, policy-makers may find it hard to choose one measure over another or to make decisions on whether or not to keep a policy in place. Cost-benefit analysis can be a useful tool to support making such decisions. The following subsection explains the concept of CBA and examines the use of cost-benefit analysis in the domain of education and early school leaving.

3.1 Cost-benefit analysis

3.1.1 What is cost-benefit analysis and why is it useful?

Cost-benefit analysis is a widely used method for calculating and comparing the costs and benefits of alternative options (München and Psacharopoulos, 2014). The idea behind cost-benefit analysis

is to capture all the costs and benefits of an option and translate them into a monetary value, so that costs and benefits can be weighed against each other (as both are seen as equally important).

A cost-benefit analysis is comprehensive, as it aims to capture all costs and benefits, also accounting for opportunity-costs[6] and the status quo. Regardless of whether costs and benefits fall on individuals or societies, are direct or indirect, or materialise in the short-run or in the long-run, all are taken into account. As such, performing a CBA encourages policy-makers to be very clear in their definition of policy objectives and implementation – as all of this information will have to be transformed into a cost or benefit that is measurable.

Cost-benefit analysis can be applied to a single or multiple policy options (Mishan and Quah, 2007). More specifically, if one is considering a single policy option or measure, a CBA can help determine whether and to what extent this measure is economically sound; i.e. whether the benefits associated with the measure surpass its costs and by how much. Similarly, when examining several policy measures at once, cost-benefit analysis can be used to provide a basis for comparing and ranking alternatives. If two options are economically sound and one can achieve similar benefits with less cost, then cost-effectiveness also becomes relevant. Assuming an accurate CBA, the option with the lowest cost-benefit ratio would be preferred from the economic point of view. However, precisely because a cost-benefit analysis is comprehensive in nature, it is very difficult to carry out a perfect CBA with flawless appraisal of all policy measures (Weimer and Vining, 2005).

Both approaches, focusing on a single measure or multiple policy measures, can be used pro-actively or retrospectively. For example, before any policy option is adopted, policy-makers can use CBA to compare alternatives in a predictive fashion and discover which measure is (most likely) the most effective and/or efficient one. Policy-makers can also use CBA to evaluate, retrospectively, whether a policy measure has met its goal within the budget that has been foreseen. As such, CBA can facilitate policy assessment at different stages of the cycle: before a programme's implementation, after its conclusion, or at an intermediary stage, to shed light on the need to make adjustments, or to decide on its continuation.

Cost-benefit analysis is not to be confused with other assessment tools, like a cost-effectiveness analysis (CEA). The main distinction between CEA and CBA is that the former only looks at a single outcome which does not have to be expressed in monetary terms. CEA compares the unit costs of various policies targeting one particular outcome. The challenge of translating benefits into a monetary value, which is the principal challenge in a CBA, can, therefore, be bypassed. While this makes cost-effectiveness analysis an attractive option, cost-benefit analysis is much more appropriate in a situation in which there are a variety of outcomes for different actors that would need to be considered. ESL, and the benefits of reducing it, is a particularly good example of that.

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[6] Opportunity cost is a concept that is widely used in economics. It reflects benefits or gains that have been lost because an alternative option was chosen. For example, when deciding between continuing education for an additional year or entering the labour market, choosing to continue education implies forgone income that could have been earned in the labour market, if the subject had chosen to enter the labour market instead.

Cost-benefit analysis can be applied to a range of topics and domains. It can be used by individuals, organisations and governments. A single investor or investment institution might use CBA to determine which of a variety of possible financial investments is the most sound. Governments, at the national, sub-national and supra-national level, may wish to appraise and compare policy options in an objective way prior to making a final decision as a justification for it.

Especially because resources are scarce and public funds are involved, policy-making would benefit from a careful consideration of where funds can be used in the most effective and efficient way. All resources that are saved by opting for the most efficient approach can be put to use elsewhere. In that way, CBA also has the benefit of encouraging substantive policy discussions and public consultations. By demonstrating the value of a set of alternatives in an objective and readily comparable manner, CBA has to potential to make a policy's aims clear and operational, communicates intentions, clarifies scale and scope, accounts (ideally) for all costs and benefits, and avoids bias that can arise by overemphasising individual positive or negative impacts. Nevertheless, the challenges and limitations of a cost-benefit analysis should not be overlooked (these are discussed in more detail below). Taking all these arguments together, CBA can, therefore, be a versatile instrument with direct value for policy-making, including in the sphere of education and early school leaving.

3.1.2 What steps does a cost-benefit analysis involve?

As CBA has broad application, more details on how it can be used to evaluate education policies are presented in the following section. In this section, we present the steps that a CBA would usually entail, as prescribed by the Commission and in the literature (Boardman, 2008; Sartori et al., 2014).

A standard execution of CBA could proceed in seven steps which are listed in the box below, while a detailed figure of each step is presented in Figure 1 in Annex A (Sartori et al., 2014).

Steps to be followed in a cost-benefit analysis, as specified by the European Commission

1. Description of the context
2. Definition of the objectives
3. Identification of the project
4. Technical feasibility and environmental sustainability
5. Financial analysis
6. Economic analysis
7. Risk assessment

Source: European Commission (Sartori et al., 2014).

A more general list of steps for executing CBA is provided by Boardman (2008), in which similarities between CBA and other models of rational choice are more readily apparent. The primary difference in Boardman's steps versus those of the Commission are that the former explicitly invites building a list of alternatives. In a perfectly rational world,[7] all possible options would be considered.

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[7] In economics, the concept of perfect rationality is used to capture situations in which individuals or actors always act to maximise their utility (to be understood as preferences). In other words, individuals are able to think through all possible outcomes and choose the course of action that will result in the best possible outcome.

> **Steps to be followed in a cost-benefit analysis, as specified by Boardman (2008)**
>
> 1. List alternative projects/programmes
> 2. List stakeholders
> 3. Select measurement(s) and measure all cost/benefit elements
> 4. Predict outcome of cost and benefits over relevant time period
> 5. Convert all costs and benefits into a common currency
> 6. Apply discount rate
> 7. Calculate net present value of project options
> 8. Perform sensitivity analysis
> 9. Adopt recommended choice

Source: Boardman (2008).

3.1.3 What are the challenges and limitations of a cost-benefit analysis?

Despite its potential, performing a cost-benefit analysis is not a straightforward task. Or, as München and Psacharopoulos (2014) describe it: "A cost-benefit analysis is the most demanding and the most comprehensive approach assessing costs and benefits" (p. 21). This is due to data-related issues as well as methodological constraints.[8] Furthermore, when considering several policy measures, the comparability of CBA results across measures also has to be considered, to avoid, for example, that the CBA of one measure only includes individual costs and benefits while the CBA of another measure also includes societal costs and benefits. Each of the challenges is explored in more detail below. In the following sections, their relevance in the context of applying CBA to the topic of education and early school leaving is clarified.

Data challenges and limitations

As was indicated in the previous section, a cost-benefit analysis should, in principle, cover all costs and benefits linked to a specific policy measure. In practice, however, this will not be possible in most of the cases in which CBA is applied. CBA is very data-intensive, because it requires data on costs and benefits at the micro-, meso- and macro-level, collected over a long period of time and for different topics. Some costs and benefits may be intangible in nature, and especially the benefits are difficult to measure or monetise. In CBA, when data are missing, these are often completed by estimations or assumptions, which affect the precision and reliability of the results. Data availability alone, thus, is insufficient; the quality of the data also has to be assured. Data also need to be timely, transparent and presented in a way that allow policy-makers to interpret them. CBA is inevitably susceptible to subjective judgements (e.g. deciding what time period is the most appropriate to analyse).

Methodological challenges and limitations

Similar to data challenges, methodological challenges are unavoidable in a CBA context, and in part they stem from data-related issues. Methodological issues are linked to timing, causality, uncertainty

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[8] For a detailed discussion, see Thematic Working Group on Early School Leaving (2013), Brunello and De Paola (2014), and München and Psacharopoulos (2014).

and the monetisation of costs and benefits, to give just a few examples (München and Psacharopoulos, 2014). Establishing causality between a measure and outcomes, for example, is difficult. In order to do so, one would need to use identification strategies (e.g. regression analysis based on instrumental variables) or research designs (e.g. natural experiments), which may not always be possible. Another example relates to the target of the policy measure. Measures may be directed towards one or more (groups of) individuals, but they can also affect others (e.g. the societal impact of reducing ESL or the effect on a student's family members and peers). Moreover, the impact of a measure may differ from individual to individual, or from group to group. In the context of early school leaving, for example, the students who leave school early form a heterogeneous group and may arrive at this point for vastly different reasons. Accordingly, the impact of a policy measure aiming to tackle ESL can differ for each of them.

With regard to timing, we present further details on discounting and the calculation of present values. Whereas the costs of a policy measure tend to emerge almost instantly, the corresponding benefits may materialise at a later date. Discounting future costs and benefits into their present value, therefore, is a common task in a CBA. This can be done as follows (München and Psacharopoulos, 2014):

$$Present\ Value\ of\ Benefits\ realised\ in\ t+1 = Benefits\ realised\ in\ t+1 * discount\ rate$$

$$with\ the\ discount\ rate\ equal\ to\ \frac{1}{1+r_t}\ and\ r_t\ equal\ to\ the\ interest\ rate\ at\ time\ t$$

This equation shows how the benefits realised in period *t+1* can be discounted to their values at time *t*. The discount rate *r* usually takes a value between 0.01 and 0.10 at time *t*. This value is generally equal to the interest rate at which the government can borrow on the financial market for public investments. If multiple time periods are considered, the discount rate would be calculated as follows (Woodhall et al., 2004; Brunello and De Paola, 2014):

$$discount\ rate = \frac{1}{(1+r)^t}\ with\ r\ the\ interest\ rate$$

In CBA in the field of education, *r* often falls between 3.5% and 6% (Woodhall et al., 2004; München and Psacharopoulos, 2014).

The net present value of a measure or programme, which captures the present value of all costs and benefits realised over period *t = 0* to *t = T*, would then be obtained as (München and Psacharopoulos, 2014):

$$Net\ Present\ Value\ (Benefits - Costs) = \sum_{t=0}^{T}\frac{Benefits_t}{(1+r)^t} - \sum_{t=0}^{T}\frac{Costs_t}{(1+r)^t}$$

The fact that benefits tend to materialise (much) later than costs needs to be accounted for. Taking a too short time period would result in an underestimation of benefits (as benefits may then not have been realised yet). Take the example of early childhood education and care (ECEC) as an illustration: participating in ECEC may have beneficial and long-lasting effects, which become visible at a later time in life (e.g. during adulthood).

Comparability issues

Although cost-benefit analysis is an instrument that allows for the comparison of policy options, there are limitations as to how far such a comparison can go. In any comparison, the national context and institutional setting should be taken into consideration. Differences in countries' societal, economic or institutional environments can have a huge impact on costs and outcomes, even when identical measures would be implemented. This not only applies to the cross-country dimension, but also across time. Also within a country, there could be substantial divergences depending on the regional or local context. Moreover, cost-benefit analyses, even those of the same measure, are based on a set of underlying assumptions, which are likely to impact the results. For example, the time period in which the measure is assessed, or the way in which the discounting is performed can have an impact. These caveats need to be taken into consideration when conducting a cost-benefit analysis.

Despite these limitations, policy-makers continue to rely on cost-benefit analysis, especially in deliberations on public investment programmes. This is owing to a number of factors, some fairly intuitive and some more subtle. Resources are finite and scarce, and decisions about where funds should be used most effectively are increasingly scrutinised and criticised. Money spent on cost-ineffective policies does not simply waste financial resources – it also precludes potentially effective spending by imposing an opportunity cost. For that reason, particularly in the case of public funding, in principle, CBA could support better decision-making resulting in more efficient and effective policies.

3.2 Cost-benefit analysis in education

Having laid out the general principles of cost-benefit analysis, this section continues with an overview of how CBA can be applied in the field of education. Cost-benefit analysis can provide educational planners with valuable information about the relationship between education and the labour market, and about the economic consequences of various educational policies. Even though the principles of cost-benefit analysis are universal and could be used to evaluate any type of policy measure, education policy measures do bring some specific challenges, which are further elaborated below.

3.2.1 Cost-benefit analysis and human capital theory

Although education has been studied in several disciplines, especially economists have approached the topic from the cost-benefit angle. In economics, education is regarded as an investment in human capital, which contributes to economic growth, productivity and competitiveness (Nelson and Phelps, 1966; Romer, 1990; Becker, 1994; Karoly et al., 2005; Wößmann and Schütz, 2006). Human capital is a concept that, in essence, captures the skills set of a worker (Goldin, 2014). It signals that there are differences in the knowledge, skills, abilities and experience that workers have, which, in turn, determine their productivity level.

This view of education as investment is rooted in human capital theory. Human capital theory dates back to the 1960s, when early research suggested that investment in education and training could build human capital along the lines of investment in physical capital (e.g. machines) (Mincer, 1958; Schultz, 1961; Becker, 1994) (although the earliest notions of this idea can be found in the work of Adam Smith of 1776). According to Becker (2002), human capital has developed into the most important form of capital, as the European economy developed from a production-based economy to a knowledge-driven economy.

The level of human capital an individual possesses depends on a number of factors, such as their educational attainment (Chevalier et al., 2006). Education is, therefore, regarded as an essential instrument to build the knowledge and skills of the labour force and raise its productivity. Research suggests that both the number of years spent and the quality of education matter for human capital acquisition, as does starting early (Heckman, 2002; 2006). Heckman (2006) argues that participation in early childhood education and care is an essential first step. He further finds that the return on investment in the early years exceeds that of investment later in life because skills are gained gradually and the acquisition of a new skill is contingent on the possession of others.

3.2.2 Typology of costs and benefits

An investment in education brings about costs and results in benefits, for both the individual and society. Using cost-benefit analysis, one can assess whether and what (additional) investments are economically sound (Woodhall et al., 2004). To perform a cost-benefit analysis of an education policy measure, one first needs to identify, quantify and discount all costs and benefits associated with it. Then, costs and benefits can be compared, on the basis of their present values.

Costs and benefits can be discerned in different ways, but the most common distinction in the academic literature on education is that between the individual and the societal level (see München and Psacharopoulos, 2014, inter alia). That is why this distinction is also made in this paper. For both the individual and the societal level, costs and benefits can be immediate or delayed, direct or indirect. For both, costs and benefits arise in many domains, including education, labour market, health and crime.

Following the same logic, München and Psacharopoulos (2014) distinguish between private (or individual) cost-benefit analysis and societal (or social) cost-benefit analysis. In the former, only individual level costs and benefits are considered. In the second case, all costs and benefits incurred at the societal level are considered; this also incorporates private costs and benefits. München and Psacharopoulos (2014) calculate the net monetary benefits of education to society as:

$$net\ monetary\ benefits = private\ benefits - private\ costs + \ societal\ benefits - societal\ costs$$

Although this distinction between the individual and the societal level may appear redundant in the context of CBA, it is in fact an important one to make because both analyses may lead to contradictory results. From the perspective of an individual, staying in school may bring high costs (e.g. tuition fees, school materials, foregone earnings from not working, etc.), which may exceed the benefits of continuing education, especially in the short-run. An individual would not take into account the societal benefits of education, which are often found to be particularly high. This may result in an under-investment in education (e.g. Dalmazzo and de Blasio, 2003; Psacharopoulos and Patrinos, 2004).

The following section presents additional details on the costs and benefits of education.

Costs of education

The costs of an educational policy measure are clear and relatively easy to calculate in most cases. They are understood as expenditure; as all the resources used up by the measure, regardless of who is bearing these costs (Woodhall et al., 2004). The expenditures represent the payment for

teachers' labour, school facilities, equipment and a variety of other goods and services. Other costs include notional items, such as the land upon which school facilities are built or foregone earnings from the time of students and teachers spent in education. Each of these costs must be factored into the CBA as 'goods' that could have been alternatively utilised.

Table 3 below, adapted from Woodhall et al. (2004), summarises the costs of education. As is clear from the table, on the cost side, detailed information is needed on what the measure actually involves, in order to understand what costs it would entail: what is the objective, how does the measure propose to achieve this, and what is the target group. For example, if a measure implies hiring additional teachers, their salaries should be taken into account.

Table 3: Individual and societal costs

	Individual Costs	Societal Costs
Direct	Tuition fees, minus average value of scholarships Books and school materials, etc.	Teachers' salaries Other current expenditure on goods and services Expenditure on books, etc. Imputed rent
Indirect	Earnings foregone	Earnings foregone

Source: Woodhall et al. (2004).

Benefits of education

On the benefits side, the effect of a policy measure – in comparison to a baseline or control group to which the measure has not been applied – is assessed on the basis of the monetary value resulting from the change in outcome it triggers. There are many potential outcomes, as illustrated in Table 4. Each of the potential benefits or outcomes is further discussed.

Individual benefits can be direct or indirect, depending on whether these benefits fall on the individual being treated and their parents, family, descendants, peers or neighbours; or depending on whether their impact is direct or flows through another outcome (e.g. many labour market effects are indirect, as they result from increased educational attainment). Moreover, individual benefits can be immediate, or surface later on. Societal benefits can generally be linked to lower spending or increased tax revenues. As before, societal benefits can be direct or indirect (e.g. increased wages due to higher levels of educational attainment may result in higher tax revenues).

Table 4: Individual and societal benefits

Domain	Individual Benefits	Societal Benefits
Education and development	Higher educational attainment Higher school completion rates	Reduced spending on education
Labour market	Improved employability Higher wages	Increased income tax revenues Better educated workforce
Health	Improved health and well-being	Reduced spending on health care
Crime and anti-social behaviour	Reduced drug and substance abuse	Reduced spending on crime

Considering the rich literature on educational and labour market outcomes of education policies (for an overview, see e.g. Wößmann and Schütz, 2006), we focus on these two domains to provide some examples of what individual and societal benefits could look like. With regard to educational outcomes, schooling is expected to result in improved cognitive and non-cognitive skills, and in higher levels of educational attainment (Carneiro and Heckman, 2003; Heckman, 2006). Cognitive skills can be measured on the basis of standardised or achievement tests, which are taken up in international surveys like PISA, PIRLS and TIMSS. Non-cognitive skills capture abilities such as maturity, social, emotional or behavioural skills. Both types of skills are intertwined – developing one set supports the development of the other. At the societal level, education policy can result in less expenditure, due to lower rates of repetition/failure, less participation in special education courses or additional lessons, etc.

In the example of labour market outcomes, improved education is translated into higher earnings and employability, higher labour productivity, greater wealth, a reduced risk of being unemployed and reduced unemployment duration, less dependency on welfare and benefits, and higher job quality or working conditions (Neal and Johnson, 1996; Currie and Thomas, 2001; Wolfe and Haveman, 2002; Wößmann and Schütz, 2006). At the societal level, this leads to increased tax revenues (due to the increased labour market participation and higher earnings) and decreased expenditure on welfare benefits.

All these effects, however, are difficult to capture and quantify, as benefits typically unfold in the long run and are both economic and non-economic in nature –calling for a multidisciplinary approach (Wößmann and Schütz, 2006). Existing research on long-run outcomes is often limited to small scale studies or pilot programmes (Temple and Reynolds, 2007). Furthermore, the literature on the benefits of education is especially large for the US, in particular when longitudinal research is considered. For the EU, fewer studies have been conducted. For all these reasons, making generalisations on the benefits of education should be approached with caution.

Nevertheless, attempts have been made to quantify the economic benefit of education (see Hanushek and Kimko, 2000; Aghion et al., 2005, inter alia). For example, in economics, there are many studies looking into the effect of adding one additional year of education on a person's labour market returns. Similar exercises have focused on the difference in outcomes between those who completed secondary or tertiary education. The relationships between education and wages is typically researched by means of a Mincer (1974) model, which links wages to educational attainment and labour market experience through regression analysis. A linear relationship is assumed between these variables. Using a Mincer equation, Montenegro and Patrinos (2014) estimated that the average increase in earnings associated with ond additional year of education at 9.1% for men and 11.4% for women, and 9.7% for both groups across the globe. Estimated returns by education level reveal the largest premium for one additional year of tertiary education (14.6%), followed by primary (11.5%) and secondary education (6.8%), reflecting the sequential nature of education. Later work using Mincer regression analysis highlighted that the relationship between wages, education and experience is convex rather than linear. Another approach to capture economic benefits is to analyse

labour force statistics and survey data, linking education to earnings (Dearden, 1999; Jenkins et al. 2007). The quantification of non-economic effects, such as impacts on health, social cohesion, development well-being and satisfaction, is even more difficult and again often based on survey data. For a thorough overview of different techniques that can be used to capture benefits, we refer to Cattan and Crawford (2013).

3.2.3 What are the challenges and limitations of a CBA of an education policy measure?

Whereas the challenges and limitations of cost-benefit analysis would also be pertinent to the context of education policy (i.e. data and methodology), there are a number of specific issues that warrant further attention (Woodhall et al., 2004; München and Psacharopoulos, 2014). In terms of quantification, for example, especially the benefits of education may be problematic because benefits are often non-monetary in nature (e.g. better social cohesion) and are broad (in terms of who they reach and in what domains).

The difference in the time of materialisation of costs and benefits also becomes relevant again. Benefits mainly materialise in the long run, which means that data collection should cover a sufficiently long time period. Evidence on long-run effects is typically derived from small-scale studies or surveys, which limits the generalisability of results. Additionally, the long time lag also complicates the identification of causal relations. Follow-up and continuous data collection are, therefore, key. Furthermore, education has strong externalities or spill-over effects that are often neglected in a CBA. As a result, estimates of the benefits are likely to be too conservative.

Beyond these theoretical difficulties, the successful execution of CBA is contingent on high-quality data. Data can come from a number of sources, such as 1) administrative data sources, regular and ad-hoc statistical surveys; 2) impact evaluation studies based on ex-ante pilot and experimental versions of educational programmes; 3) findings of related studies already completed; or 4) expert opinions and analysis (München and Psacharopoulos, 2014). Accessing high-quality, relevant and comparable data for CBA of education policy is challenging in its own right. In part owing to this challenge, CBA is used less frequently in the field of education in comparison to other public policy areas such as health and employment. Additionally, CBA for education in the EU appears less established than in the US, creating an additional challenge for Europe-based research (ibid.).

Nevertheless, CBA has significant strengths that are directly relevant to education policy (in particular, when policies are concerned with the relationship to employment). CBA can combine information about the costs of different educational programmes, along with information about the balance between the supply and demand for different categories of educated labour. CBA also brings greater focus to a few key variables, such as relative costs of different types of education and relative earnings of different types of labour. Therefore, "…although cost-benefit analysis may not always provide planners with unambiguous policy directives, it does provide them with information useful for making rational policy decisions" (Woodhall et al., 2004).

3.3 Cost-benefit analysis and early school leaving

Cost-benefit analysis has also been used to evaluate policy measures aimed at reducing ESL (see e.g. Psacharopoulos, 2007; Brunello and De Paola, 2014). In this case, the *cost side* captures all

costs associated with the introduction of a policy measure, whereas the *benefits side* corresponds to the decrease in the costs associated with ESL. As before, costs and benefits can affect the individual as well as society, be direct or indirect, and materialise in the short run or later on. Whereas some costs and benefits are tangible, others are intangible and, therefore, more difficult to identify and monetise. Especially benefits or outcomes are not always measured. Similarly, societal costs and benefits may be particularly hard to quantify, as it is not always clear who is impacted by the measure. Causal effects are hard to identify.

In order to understand how one might approach a cost-benefit analysis of early school leaving and the measures aiming to reduce it, we must first shed more light on the different types of measures that have been introduced. As explained above, there are many policy options when it comes to tackling ESL. Brunello and De Paola (2014), for example, distinguish between measures that target the entire school system and measures that target schools-at-risk or students-at-risk. Following the reports of the European Commission (Council of the European Union, 2011; European Commission, 2011), we distinguish between preventive, intervention and compensatory measures.

Besides the differentiation in policy measures, it is important to reiterate that a good understanding of early school leaving is the first step in the design of effective measures targeting it. This includes knowledge about the age at which discontinuation of education and training occurs, the relationship between ESL and truancy, ESL differences relating to gender, academic performance or achieved education levels, the socio-economic background, migration or minority background and or native language of the students. All these factors influence the risk of early school leaving and should, therefore, be taken into consideration (Project Papers 4, 5 and 6).

3.3.1 What policy measures have been proposed to tackle ESL?

In most EU Member States, a combination of preventive, intervention and compensatory measures has been implemented with a view to tackling early school leaving. Also in the nine countries of the RESL.eu project, a mix of measures was found. Whereas some of these measures show similarities to those found in other countries, others are much more specific and tailored to the national context.

The Thematic Working Group on Early School Leaving (2013) and Brunello and De Paola (2014) lists different types of preventive, intervention and compensatory measures that can be used to address early school leaving (as shown in Table 5). Examples of the RESL.eu project are presented below.

Table 5: Preventive, intervention and compensatory measures

Type	Examples
Prevention	• Access to high-quality ECEC → *Develop key competences* • Relevant and engaging curriculum; content of teaching → *Motivation* • Flexible educational pathways; structure of teaching; tracking → *Avoid premature choices, orientation* • Changes in the length of compulsory education • Changes in class size • Better integration of newly arrived migrant children → *Inclusive environment* • Smooth transitions between different levels of education • High quality, attractive and engaging VET

	• Involvement of students and parents in school decision-making → *Ownership, representation* • Initial and continuous education for education staff → *Quality of education* • Whole school approaches • Strong and well-developed guidance system → *Informed choices, coaching* • Cooperation with the world of work • Conditional cash transfers • Additional resources for schools with disadvantaged children
Intervention	• Early warning systems → *Monitoring* • Systemic support frameworks within schools → *Care/support team* • Focus on the needs of the individual pupil • Extra-curricular and out-of-school activities to enrich the learning offer • Support to teachers → *Teamwork, networking* • Empower families and parents to support children's education • Raise parental awareness of ESL
Compensation	• Accessible and relevant second chance schemes • Recognition → *Recognition and validation of second chance education* • Commitment and governance → *School management* • Personalised and holistic approach to second chance education • Distinctive learning experience → *Positive experience* • Flexibility in the curricula • Teacher involvement and support → *Broader role of teacher* • Links between second chance education and mainstream education → *Genuine alternative*

Note: Preventive measures consider the pre-conditions for successful schooling and the design of education and training systems, intervention measures address emerging difficulties (school-wide/student-focused), compensatory measures aspire to re-engage people in education and training.
Source: Own elaboration adapted from Thematic Working Group on Early School Leaving (2013) and Brunello and De Paola (2014).

3.3.2 Cost-benefit analysis of ESL policy measures

Some academic studies have attempted to assess the effectiveness of specific ESL policies, although their number is limited (Thematic Working Group on Early School Leaving, 2013; Brunello and De Paola, 2014). While some of these studies have used cost-benefit analysis to evaluate policy measures, other studies have performed a more limited analysis focusing only on specific types of outcomes (using differences-in-differences to establish causal relationships, matching, or exploiting exogenous variations) (e.g. Machin et al., 2004; Bénabou et al, 2009; Machin and McNally, 2012). A lack of data, but also the design of the measures, may impede cost-benefit analysis. ESL measures are often holistic in nature, but this is not always taken into consideration in their analysis. Also long-run effects are often overlooked. Moreover, several studies highlight a single measure or case, and tend to overlook the fiscal costs and benefits associated with lowering early school leaving (Brunello and De Paola, 2014).[9]

The benefits of lowering the ESL rates follow directly from the reduction in the costs of early school leaving (Thematic Working Group on Early School Leaving, 2013). Diminishing the rate of ESL lowers the costs. The costs of ESL are well-documented in the academic literature (Brunello and De

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[9] At the individual level, the costs of an ESL measure involve, for example, tuition fees. At the societal level, there are for example staff costs, equipment and infrastructure. Fiscal costs are often included into the societal costs, but not always.

Paola, 2014). These costs include, for example, lower lifetime earnings, higher unemployment incidence and unemployment duration (at the individual level), lower tax revenues and increased spending. In the literature, the benefits of reducing ESL are often assessed by comparing those who completed secondary education with those who did not (Dale, 2010). When comparing both groups, it is clear that the individuals who completed secondary education have better educational, labour market, social, behavioural and health-related outcomes.

Although the costs of ESL, or the benefits of adding one additional year of schooling can and have been quantified in the literature, these calculations are difficult to make and prone to estimation errors (Dale, 2010; Thematic Working Group on Early School Leaving, 2013). Moreover, the magnitude of the effect is heavily dependent on the variables that are included in the estimation, which may result in rather different findings across different studies. An additional year of schooling can lead to a 4% to 10% increase in individual lifetime earnings, depending on how it is calculated, according to Brunello and De Paola (2014).

Costs and benefits can then be brought together into a cost-benefit analysis. One example of a CBA of an ESL measure is Bingley et al. (2005). These authors assess the impact of changes in class size for the case of Denmark. Bingley et al. (2005) find that the ratio of benefits to costs (both discounted) of a 5% reduction in class size is very low; in hardly any cases do the benefits outweigh the costs of the measure (e.g. the study finds that benefits exceed the costs for males in some cases, depending on the discount rate applied in the calculations).

Another CBA example is presented in the work of Dearden et al. (2014) on the Earnings Maintenance Allowance programme that was piloted in the UK in the 1990s. Students aged 16 to 18 from low-income families would receive a cash benefit for staying in full-time education after completing compulsory education, and there were also additional bonuses given for regular attendance and successful completion of examinations. Dearden et al. (2014) concluded that this pilot programme had a significant and positive impact on post-compulsory education (completion rates went up with 6.7 percentage points), whereas both inactivity and unemployment declined. The corresponding rise in future earnings was also significant.

A third example is the study by Machin and McNally (2012), who examine the Excellence in Cities policy that was introduced in 1999. In the context of this programme, schools in disadvantaged areas of the UK received extra funds, allowing them to hire mentors and set up new programmes (e.g. for gifted students or students who were struggling). While a positive impact on learning and attendance was found, benefits were at the same level as the programme's costs.

From these examples of cost-benefit analyses in the domain of early school leaving, one can derive that these analyses typically focus on a very specific programme, involve a substantial data collection effort, and are limited in terms of the outcomes that are monitored (e.g. a small number of educational or labour market indicators), as was also hinted at above. Such an approach is more pragmatic than trying to carry out a comprehensive cost-benefit analysis and would be less demanding in methodological and data terms.

4. Applying the principles of cost-benefit analysis to RESL.eu

Building on the review of the literature on cost-benefit analysis and its application to education and early school leaving presented in the previous section, this section explores the possibilities of doing a cost-benefit analysis in the context of the RESL.eu project. Within RESL.eu, a range of preventive, intervention and compensatory measures aimed at reducing early school leaving have been examined; and detailed information on each of these measures was collected. In addition, given the richness of the RESL.eu project in terms of the countries and policy measures covered, it be a particularly interesting and relevant starting point for a cost-benefit analysis, not in the least because similar measures are introduced in different countries (which would allow one to capture the impact of the national context and institutions).

Against this background, this section aims to explore the potential of performing a cost-benefit analysis based on RESL.eu. This exercise is theoretical in nature; it sets out to inform researchers and/or policy-makers who would be interested in using a cost-benefit analysis for a future project, by pointing out the data that would be required, methodological challenges and potential solutions, and other issues that may complicate a cost-benefit analysis, using the RESL.eu project as an example. This paper, therefore, does not aspire to do a CBA for the measures of RESL.eu. Put differently, the paper does not seek to calculate costs and benefits for the measures that were studied.

Nevertheless, RESL.eu forms an interesting basis for reflection. Within the project, a very high number of preventive, intervention and compensatory measures are studied. These policy measures are already in place, which means that the cost-benefit analysis would be retrospective in nature. CBA could also be used in a prospective way, to compare different policy options prior to their implementation. This type of analysis would not be relevant in the context of RESL.eu. In addition, the target population of the policy measures differ, which hampers direct comparisons. Additionally, because early school leavers are a heterogeneous group, any type of comparison would need to ensure that similar individuals and measures are assessed in a similar way.

Within the RESL.eu project, the ambition is not to understand the costs and benefits of education or educational policy at large, but rather to focus specifically on the ESL measures. This point is clarified in the following example: consider a policy measure that involves a decrease in class size. In the CBA exploration in this report, the focus will only be on the costs and benefits linked to this reduction, such as the additional teaching hours, class rooms, etc. that are needed. Any costs or benefits associated with the school system or education as such are eliminated from the analysis.

4.1 Lessons from the literature for the RESL.eu project

Based on the review of the literature, there are several challenges and limitations that would complicate performing a cost-benefit analysis in the context of the RESL.eu project.

The first issue relates to **data**. Detailed information on the costs and benefits of the policy measures is needed. Within the RESL.eu project, data were collected especially on the micro- and meso-level, whereas much less information on the macro-level is available (i.e. the policy measures were studied from the perspective of the individual and institution, not from a wider context). Considering the ho-

listic nature of many ESL policies, this is problematic. For the majority of the policy measures examined in the RESL.eu project, there is little or no information available on benefits and, moreover, information is missing at all levels: individual and societal, and for different types of outcomes. Especially for benefits, the societal impact is very important, and it is precisely here that the least information is available.

In addition, while longitudinal data are available (collected in successive rounds of surveys and interviews), the data still refer to a quite short time span. Benefits, however, tend to materialise only in a much longer run. Much of the data that would be necessary to perform a cost-benefit analysis are unavailable in the RESL.eu project.

The second issue relates to **methodology**. The quantification of costs and benefits again proves to be a challenging task (societal benefits cause difficulties, but they may very well be the main motivation for governments to play a role in the domain of education). With regard to the cost side, the RESL.eu project presents detailed descriptions of the measures, which allow researchers to derive information on potential costs – although hardly any information is available on their magnitude. Despite these challenges and limitations, the RESL.eu project does provide rich descriptions of the measures examined, the national context in which these measures should be regarded as well as the views of the students, staff and designers of the measure.

The third issue relates to **comparability**. For RESL.eu, the focus would be on identifying and pointing out similarities and differences between the countries and measures examined, without making generalisations.[10]

Given the large number of policy measures studied in the project, performing a cost-benefit analysis for all of them would far exceed the time available. For that reason, this report will not explore the possibilities to conduct a CBA for all measures. Instead, **14 measures** are selected (according to the rationale explained in the methods section): seven preventive or intervention measures, and seven compensatory measures (one of each for the countries for which detailed information is available in RESL.eu, the countries are Belgium, the Netherlands, Poland, Portugal, Spain, Sweden and the UK).

The 14 measures that are examined in this paper are listed in Table 1 and Table 2 and presented in more detail below. For the *preventive and intervention measures*, both school-wide measures (e.g. orientation (ES, inclusion team (UK), or integrated/inclusive nature of the school (PL)) and student-focused measures (e.g. care structure (NL)) are used. The Belgian case (student counselling and socio-emotional support) is an interesting one, as that measure is both school-wide and student-focused. The selected student-focused measures generally are focused on **counselling and care**,

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[10] The typology of costs, for example, can be similar in the different countries. For example, two policy measures that involve reducing class sizes in two countries would both imply that more teachers are needed, additional infrastructure is needed, etc. – these are similar in nature but they may have a very different magnitude. Moreover, considering the heterogeneity in national education systems and institutional contexts, it is difficult to assess whether identical measures would have an identical impact, but this will most likely not be the case.

e.g. educational class advisor (PT) and care structure (NL). Interestingly, a number of these measures involve tutoring in smaller class groups (e.g. individual alternative (SE)).

For *compensatory measures*, a personalised and holistic approach and a focus on ensuring a positive learning experience is found in almost all of the compensatory measures studied. All measures provide some sort of combination of **general/vocational education, internships and counselling,** e.g. career advice (UK), therapeutic sessions (PL), and guidance and support (ES). In order to offer students an integrated programme, many of the alternative learning arenas collaborate with outside partners, e.g. alternative vocational education programme (PL). Flexibility is likewise present in several cases. The Swedish individual alternative measure, for example, allows for an individualised, flexible programme. Similarly, the modular set-up of the Belgian modular system programme allows for flexibility. Also, accessibility is a common feature of the compensatory measures. Teacher involvement and support is found in the UK example (bridging course).

Owing to the different scope of the selected preventive and intervention measures, and the selected compensatory measures, the distinction is made between these two groups in the exploration of the potential costs and benefits associated with them. Nevertheless, there are some overlaps in the discussion on costs and benefits that are difficult to avoid. For this reason, substantial information is provided when a specific type of cost or benefit is discussed for the preventive and intervention measures, and less details are given when these costs and benefits are discussed for compensatory measures. Instead, much more attention is then devoted to the differences between the measures.

4.1.1 Preventive and intervention measures

Student Counselling and Socio-emotional Support (BE) aims to prevent ESL by targeting socially disadvantaged students with a supportive school climate, seeking to focus on problems that can lead to lower academic performance and dropping out. This is accomplished using a tiered approach that includes regular one-on-one informal talks with teachers.

Orientation (ES) is a school-wide measure that aims to prevent ESL by informing students about their future career choices (both inside and outside education), so that they can make informed decisions. Students are asked to fill out questionnaires about their skills, aspirations and interests.

Care Structure (NL) is a preventive measure. It aims to prevent early school leaving by providing advice and support related primarily to incidents outside of school (such as family issues, financial problems, etc.).

Integrated/Inclusive Nature of the School (PL) has the purpose of providing a safe and inclusive learning atmosphere without stigma and social exclusion. This is accomplished by integrating students with special needs into mainstream classrooms and teaching / encouraging sensitivity, openness, tolerance, and understanding for people with different needs and limitations.

Educational Class Advisor (PT) is a preventive measure that aims to tackle ESL by devoting time (class hour) during which students can discuss class problems, absenteeism, behavioural issues and other concerns with an advisor.

Individual Alternative (SE) is a programme that aims to achieve compulsory school qualification and eligibility for a national upper-secondary programme. It accomplishes this by targeting students who lack these qualifications, providing a youth coach, and forming small study groups in which teachers spend more time on certain topics.

Inclusion Team (UK) sets out to prevent ESL for at-risk youth in a very ethno-linguistically diverse student populace. Accomplishes this in a variety of ways including a "Buddy" scheme, an extensive community network, outreach to parents, counselling and a variety of innovative practices. The programme targets at-risk youth through a referral system called the "Referral Pathway", through which staff refer troubled students to the Inclusion Team and initiate a series of measures.

4.1.2 Compensatory measures

Modular system (BE) aims to ensure that people who left secondary education without a diploma have a second chance to obtain a degree through a more flexible system which may increase students' motivation. Accomplished by splitting a curriculum into separate modules that award "partial certificates", improving the chances for students to approach and complete their curricula in a flexible way. This measure is implemented in second chance education for adults that serves people that are 18 years old or older who did not complete secondary education.

JPO (ES) provides basic vocational training, guidance and support actions for participants, as well as assists in completing an internship with partner companies. The measure targets unemployed ESL youth between 16-24 years old with a maximum level of education of ISCED 2 registered in the Spanish EU Youth Guarantee Plan.

Talent for Care (NL) is a measure aiming to provide basic qualifications. It does so with a combined programme of school-based or work-based education, a residence, and two hours of individual coaching per week. The measure targets youth between 18-24 years of age who i) dropped out of school, education, training or work, or ii) are at risk of doing so.

Alternative Vocational Education Programme (PL) strives to achieve the most basic educational goals, primarily in Polish and in math, for very troubled youth. The end goal is a diploma and often professional qualifications to pass an external practical exam. It offers dormitories with 24-hour supervision for those who need them. This programme lasts two years, instead of three years as is the case in mainstream schools.

Apprenticeship with Labour Insertion Guarantee (PT) has the purpose of providing dual ISCED III and professional certification and to guarantee the labour insertion of the young graduates by means of close collaboration with the wood and furniture companies in the region. Dual ISCED III and professional certification, as well as full-time employment, are the end goal.

Vocational Training Course (SE) sets out to provide a vocational training course at upper secondary school level. After completing this programme, the students are awarded a diploma. They also receive grades and study credits for the modules that they have passed, and these credits can be counted towards an ISCED level 3 qualification. The measure targets youth who left upper secondary school without an ISCED level 3 qualification, but is open to all adults over the age of 20.

Bridging Course (UK) aims to "get young people back where they want to be" with a full set of qualifications needed for further studies or successful employment. It accomplishes this by providing a full set of qualifications for further studies or successful employment, as well as soft skills. Counselling and private tutoring are also provided throughout. The measure targets 16-18 year olds who have had their education disrupted.

4.1.3 Applying CBA to these measures

In applying the principles of cost-benefit analysis to the preventive, intervention and compensatory measures of the RESL.eu project, it is first necessary to understand the common and differentiated elements between them. By grouping similar measures and discussing the costs and benefits associated with them simultaneously, one can avoid having to repeat the same information for each individual measure and draw comparisons between measures that have common characteristics.

In order to do so, the following four criteria are considered:

1. **What are the measure's specific provisions?**
   Preventive and intervention measures: For example, does it involve general education, vocational training, personalised counselling or care, is it school-wide or student-focussed etc.?
   Compensatory measures: For example, does it involve general education, vocational training, internships, personalised counselling, etc.?

2. **Who does the measure target?**
   Preventive and intervention measures: Considering age, gender, whether participants are applicants (all/some) or referrals (all/some), etc.
   Compensatory measures: Considering age, gender, whether participants are applicants (all/some) or referrals (all/some), etc.

3. **What is the objective?**
   Preventive and intervention measures: For example, is the aim to ensure that participations obtain a degree or certificate only, or are there also other objectives (e.g. facilitate transition to higher education or labour market)?
   Compensatory measures: For example, is the aim to ensure that participants obtain a degree or certificate, is it focused on transitions into the labour market, both, etc.?

4. **How is the measure implemented?**
   Preventive and intervention measures: In terms of funding[11] (public, private, mix), structure (collaboration, single institute, regular school, residence).
   Compensatory measures: In terms of funding (public, private, mix), structure (collaboration, single institute, regular school, residence).

Each of the above categories helps to assess the costs and benefits associated with a programme at the individual and societal levels. The first and fourth criteria are particularly useful in determining

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[11] This is important in differentiating individual and societal costs.

costs, while the first three criteria are specifically informative for benefits. In Annex B, we present an example of a table with this taxonomy filled out for one preventive and intervention measure and one compensatory measure (for Spain and Poland).

With these criteria at hand, measures are loosely grouped and discussed together. The compensatory measures selected are relatively similar for most of the countries. All measures are some kind of combination of general education, vocational training, counselling and internships. Of the compensatory measures, both Poland and the Netherlands include residency. The preventive and intervention measures are more diverse, with school-wide as well as student-focused measures, measures linked to care and counselling, orientation and inclusion. In that way, Belgium, the Netherlands and Portugal are joined, and so are Poland and the UK.

Note that the discussion of costs and benefits only considers the effects tied to the measure, i.e. the costs related to its implementation and the benefits that follow from it. If schools have an extensive ESL strategy of which the analysed measure is one part, then only the effects of this specific measure are considered. In this regard, it is important to acknowledge that the preventive and intervention measures are set up within the context of a specific school, which was already in place. This may also be the case for the compensatory measures, but not necessarily. For that reason, much more attention is devoted to the infrastructure costs in the discussion of compensatory measures. For the preventive and intervention measures, staff costs appear to be much more relevant.

4.2 Preventive and intervention measures

This section reflects on the costs and benefits linked to the seven selected preventive and intervention measures of the RESL.eu project.

4.2.1 Costs

On the cost side, a distinction is made between direct and indirect costs, and individual and society costs; with a focus on staff, equipment and infrastructure as well as foregone earnings.

Society - Direct Costs

The starting point for calculating the societal costs of these programme are the following three categories: staff salaries, teaching equipment and other goods and services, and school buildings.

Salaries

We begin by applying this framework to the salaries of the Belgian, Dutch and Portuguese programmes. Belgium's Student Counselling and Socio-emotional Support program is school-wide, but targeting students at risk of ESL. This measure entails one-on-one reflection meetings between teachers and students. Teachers are responsible for adding information on at-risk students into a digital follow-up system called the Care System. Each student file within the Care System is followed by a student coordinator. On a monthly basis, the student's teacher, a student counsellor from the Centre for Pupil Guidance (CLB, an external service financed by the Flemish government) and the student coordinator meet to discuss the student's trajectory and to draw strategies. Both support strategies and disciplinary measures can form part of the strategies.

Belgium's programme necessitates compensating additional work for the teachers, student coordinators and student counsellors. This can be calculated as follows:

First, for each staff category (for example, teacher, counsellor), the number of staff members is multiplied by their salary and the share of hours dedicated to the ESL programme:

 # staff members of type * salary at market rate* share of expected annual hours dedicated to measure

Then, the sum of all these staff costs is made (i.e. summing all categories):

$$\sum_{x=i}^{I} \textit{staff costs category x}$$

This calculation assumes that each staffer would be employed by the school in any case, but dedicates a portion of their working hours to the ESL programme. Generally, however, this may not be the case, particularly for teachers. If a teacher is simply instructed to track and refer at-risk students, then doing so may be possible within the normal scope of teaching duties. Assuming this to be true, then the salaries of the teachers themselves would not be a sizable consideration for the cost analysis of an ESL programme. Based on the description of the Dutch programme, it does appear to entail a burden of additional working hours for the teachers.

As will become clear below, staff costs related to the different ESL programmes could be calculated according to these equations, with the main differences across the countries and measures being: the categories of staff members to take into consideration, the differences in salaries for these categories, and the differences in hours dedicated to the measure (full-time or part-time).

In Portugal's Orientador Educativo da Turma (OET) (Educational Class Advisor) programme, a member of the teaching staff is responsible for discussing issues regarding absenteeism and behavioural issues with students. The OET assists in providing pedagogical support, monitoring support activities, coordinating partnerships, taking appropriate measures with parents, etc. Assuming the OET is a full-time position that would not exist absent the ESL programme, the salary costs could be calculated in a similar way as before, but then for these new staff members only and considering that they work full-time for the ESL programme:

For each staff category:

 # staff members of type * salary at market rate

Calculating the sum of all categories:

$$\sum_{x=i}^{I} \textit{staff costs category x}$$

Of course, the market rate of a given position would vary greatly based on the type of duties staff members are responsible for, requisite educational background and work experience, market costs in a particular region and other considerations. The costs to employ a nurse, counsellor and upper-secondary school teacher would likely be quite different, which necessitates up-to-date and accurate

data on salaries for a reasonably accurate CBA. Especially if cross-country comparisons would be made, this divergence would need to be accounted for.

For the British measure studied here, it appears that a number of specific staff members are embedded within the schools to provide ESL support. In the British programme, an assortment of professionals is employed to work with specific students and groups, including EAL (English as an additional language) teachers, teaching assistants to support non-native English speakers, inclusion co-ordinators for targeted intervention programmes, an attendance officer, a school counsellor/child psychotherapist, and others. As mentioned earlier, the nature of the UK's programme makes it difficult to distinguish salary costs that the school would have incurred in any case, versus those specific to implementing the ESL programme. Assuming that the staff members would always have been employed by the school, and merely dedicate a portion of their working hours to an ESL programme, the calculation for salary costs would again follow the same logic (but accounting for the part-time nature of the work, as was the case for the Belgian measure).

In Spain, the implementation of the Academic Orientation (Orientació) measure appears to vary considerably across schools as each school is allowed substantive freedom in designing and implementing it. Nevertheless, it seems that key parts of the programme include offering last-year students access to class tutors and talks with outside lecturers. The salary of the tutors must be included in the cost analysis, as well as the speaking fees for lecturers if applicable. In addition to assisting with coursework, tutors have the responsibility to help arrange talks, distribute career questionnaires to students and explore possible trajectories with them, and in some activities in BAT years 1 and 2, possibly accompany students to universities and education fairs, and other relevant activities. Given that the tutors who are active in Academic Orientation only dedicate a portion of their working hours to monitoring and other activities related to ESL, it seems reasonable to assume that calculating their salary costs would again incorporate a percentage of expected annual hours, as before.

In Sweden, the Individual Alternative (IA) programme is part of a legally mandated programme to offer introductory courses. While a national measure, each school is responsible for its design and implementation. The IA programme involves teachers, a youth coach and a student counsellor. Additionally, the number of students per teacher in the programme is lower than for typical classes – namely fewer than 9 students per teacher. Thus, Sweden's programme implies the costs associated with the salaries of additional teachers, youth coaches and a student counsellor.

A general consideration for ESL programmes is that, assuming additional training is required for staff to carry out certain roles, paying the staffers for their time in training and paying people to train them could represent a significant cost. Additional training of regular teaching staff has been identified as a relevant measure against ESL (Policy Brief 1, Thematic Working Group on Early School Leaving, 2013). The cost of training can be calculated as the sum of the staff costs of the trainer and the staff costs of the teachers or other staff members taking part in the training (assuming that training is part of their working time):

For each trainer: *Net hourly market rate of trainer * hours of training*

For each staff member: *Salary at market rate * hours of training*

The key point in calculating salary costs for ESL measures is to make two determinations: 1) whether or not a given staff member would have been employed in any case by the institution; and 2) if so, knowing what portion of their time would be dedicated to an ESL programme. Without information on these two issues, an accurate determination of salary would not be possible. Finally, in order to implement complex programmes, it is likely that procuring additional help for coordination and administration would be necessary. These administrative and coordination staffing costs can be estimated in the same way as other costs are calculated above.

Teaching equipment/other goods and services

With regard to teaching equipment/other goods and services, computers, blackboards, textbooks, stationary, writing implements and other equipment need to be accounted for in tallying the costs of the ESL measures. These costs, however, are expected to be fairly low in the case of the measures of the RESL.eu project, precisely because these measures are introduced in the context of existing schools. Some additional materials may, nevertheless, be required. For example, for the Academic Orientation measure in Spain, additional materials focused on career guidance may be introduced in class. The costs of these materials would need to be calculated and taken into account.

Prior to its recent reform, the Polish measure (Integration Classes) also presented an interesting example of additional costs. Until recently, each teacher was responsible for dedicating one hour per week to running a student club. Depending on the type of club that was set up, some additional equipment costs could be foreseeable. If this system would still be in place, the additional costs would have been calculated as follows:

$$Costs = Costs\ of\ shared\ teaching\ materials + \\ (Average\ costs\ of\ individual\ teaching\ materials * number\ of\ students)^{12}$$

Depending on the nature of the club and the school's resources, this could represent a negligible or a significant expense. But generally speaking, it does not appear that equipment costs or other goods and services are an important feature of the surveyed measures, at least to the extent that they were described in the RESL.eu project. Students and teachers would require similar equipment and materials whether or not they take part in an ESL programme.

School buildings

Similar to equipment and materials, the costs for school buildings are minimal for the selected preventive and intervention programmes. Of course, a school building must exist and be paid for regardless of whether an ESL programme is implemented. However, in cases where reduced class size is a feature of an ESL programme, school building costs must be considered.

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[12] Individual teaching materials are understood as those needed by each individual student, such as textbooks provided by the school. Shared teaching materials include blackboards, overhead projectors and other items that are used for multiple students. The cost of shared teaching materials is assumed to be adequate for the number of students participating in an ESL programme.

In Sweden's Individual Alternative programme for example, class sizes are significantly smaller than normal, necessitating additional rooms to be available (which may result in costs linked to rent, energy use, cleaning services, etc.). This may or may not represent an additional burden, depending on whether the school was already using its full capacity prior to implementing the ESL programme.

If an additional classroom is rented, then the annual rent can be used in calculating the cost of the school building. Generally speaking, however, school buildings and classrooms are not rented. Most often, a depreciation or amortisation is needed to calculate the value of maintaining and using an asset (Levin and McEwan, 2001; Woodhall, 2004; Collini and Kee, 2010).[13] Thus, the cost for additional classrooms or facilities could be calculated by summing the annual rent or amortisation for each room or facility.

Other cost considerations

The RESL.eu programmes showed a number of different funding mechanisms. In the case of the Netherlands, the school receives additional funding if an at-risk student is labelled LWOO (having severe learning or behavioural problems). Similarly, the UK's Inclusion Team is funded partially by money received from the Pupil Premium. The Pupil Premium is additional funding for pupils registered as eligible for free school meals at any point in the last 6 years (£1,320 for pupils in reception to year 6 (about €1,500), £935 for pupils in year 7 to year 11 (about €1,060)), and £1,900 (about €2,160) for students designated as Looked-after children (LAC) in the Children Act 1989, or having left local-authority care.

However, this is not a part of CBA. CBA is not concerned with the source of funding except in distinguishing costs between society and individuals. Costs must be analysed in a vacuum, irrespective of the funding for a programme.

Society - Indirect costs
The indirect societal costs are the foregone earnings (on which more details are also provided below), or the amount of earnings an individual gives up when devoting time to studies rather than working in the labour market (München and Psacharopoulos, 2014). However, it seems likely that foregone earnings are less relevant in the context of the preventive and intervention measures of the RESL.eu project analysed here, because these measures are implemented within schools, meaning that it is safe to assume that we are dealing with students who are still of the age of compulsory education. However, in some cases, students at the age of compulsory education are allowed to work. In Portugal, for example, where the age of compulsory education is 18, youngsters are allowed to work starting from age 16 on the condition that the workplace provides them with the

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[13] Amortisation or depreciation refers to the write-off of assets; i.e. a reduction in the value of assets over time so that it reflects how their worth goes down over time due to wear and tear. For example, by using a school building over time, it deteriorates and its value on the market is reduced.

necessary means to continue studying. In such cases, foregone earnings would need to be accounted for.

Individuals – Direct costs

The direct costs for individuals are understood to entail tuition and incidental expenses associated with education.

Tuition

Having surveyed the RESL.eu preventive and intervention measures, it was not immediately evident that any ESL programmes charge tuition. The key consideration for analysing this cost would be determining whether tuition is charged for access to a programme, and if so, whether a student is still responsible for paying for their education generally. If tuition costs €1,000 per year, and access to an ESL programme is an additional €500 per year, then this must be tallied. If a school offers two tracks, one for the general student body costing €1,000 per year, and one for students at risk of ESL for €1,000 per year, then the tuition of the ESL programme would only factor into a CBA after the point where schooling is no longer mandatory. This is because the student would have incurred the same expense regardless of whether s/he took part in the ESL programme.

Two additional considerations are that if scholarships are awarded, they must be subtracted from the individual cost of tuition. Second, if tuition costs help fund the programme's operation, then they must not be counted twice (e.g. for individual and societal costs). Tuition is calculated as follows:

$$\text{\# of students} * (\text{annual cost of tuition} - \mathit{average\ scholarship})$$

Incidental schooling expenses

Incidental schooling expenses include books, writing implements and any other equipment that the student is expected to provide for themselves. The average cost of incidental schooling expenses or a best estimate would be multiplied by the number of students. Thus, the total annual direct costs for individuals would be calculated as follows:

$$\text{\# of students} * (\mathit{average\ cost\ of\ schooling\ expenses})$$

The average cost of incidental schooling expenses can be estimated using survey results or market or administrative data. It is important only to calculate expenses that would not have been incurred in the normal course of a student's requisite education.

Individuals – Indirect costs

The indirect costs to individuals mainly involve foregone earnings of the students.

Foregone earnings

The calculation for foregone earnings would be based on the average income a student could have earned if s/he had been in the labour force rather than participated in an ESL programme. The assumption would be that a student taking part in an ESL programme is unable to work during their education, but this assumption may not hold in many instances. For example, some measures allow

a student to complete courses in a more flexible manner, including taking fewer courses at a given time. In this case, the amount of average working hours lost due to taking part in an ESL programme would be the key measure. As already indicated above, it is unlikely that foregone earnings would be an important category to consider, because most students would not be allowed to work.

Once the number of working hours foregone is known, salaries must be calculated. Obviously these vary a good deal from region to region, and it is also important to factor in the level of education. Those with no lower-secondary education would earn less than those who have completed lower secondary but not upper secondary.

The net salary should be calculated to reflect the actual take-home income a student foregoes. Additionally, it must be assumed that not all students would have been employed if they were not in school. This means the employment rate of an individual in a given region with a given educational level must also be factored into the calculations, although this effect can be built into the CBA elsewhere and should not be counted twice. Foregone earnings can be calculated as follows, assuming the student is unable to work while taking part in an ESL programme:

$$(\# \; working \; students \; without \; lower \; secondary \; education * average \; salary)$$
$$+ \; (\# \; working \; students \; with \; lower \; secondary \; education * average \; salary)$$

If the average student is able to work part of the time while attending a programme, the calculation would be as follows:

$$(\# working \; students \; without \; lower \; secondary \; education * avg \; salary$$
$$* \% \; of \; annual \; working \; hours \; lost)$$

$$+ \; (\# \; working \; students \; with \; lower \; secondary \; education * average \; salary$$
$$* \; share \; of \; annual \; working \; hours \; lost$$

4.2.2 Benefits

We will focus on the benefits of reducing early school leaving as examined in the RESL.eu project. More precisely, education can be thought to yield benefits that are inherent to education itself, whereas more narrowly, education can produce benefits by avoiding costs associated with ESL. The costs associated with ESL are very broad as previously discussed, including reduced lifetime earnings, higher unemployment incidence and duration, more health problems and criminality, etc. The simplest way to understand the benefits of an ESL programme may, therefore, be to calculate the costs of ESL, assume them to be gains and discount them as is standard in CBA. Similar to the costs section above, the benefits will be distinguished at the societal and individual level.

In comparison to the section on costs, however, the benefits will be handled differently in two ways. First, no distinction will be made between direct and indirect costs, on the grounds that the distinction is somewhat artificial in the case of benefits and does not aid understanding. For costs, handling direct and indirect separately was sensible because of the difference between costs and *opportunity costs*. For benefits, the same logic does not apply. The second difference is that in calculating the benefits, the reduction in ESL and its consequences on education, labour market, health, crime and

other outcomes, would need to be identified and monetised. To this end, data on the specific objective of the measure and its precise impact on the ESL rate would be needed.[14] This calls for an evaluation of the policy measure – information that, unfortunately, is typically not available in the RESL.eu project.

Evaluating the benefits in this way is based on the comparison of outcomes for a treatment and a control group, with high school graduates typically being the control group. The assumption inherent here would be that the two groups only differ in being early school leavers or not. However, these groups tend to differ on other observable and unobservable lines as well. Standard multivariate regression can account for observable differences, but unobserved differences could also be important. If it is assumed that high school graduates have more innate abilities than early school leavers, for example, then the average observed differences in earnings between the control group and the treatment group will overestimate the individual benefits of additional education (Brunello and De Paola, 2014). For this reason, caution is required in evaluating the benefits of ESL measures, even if considering the lower bound.

Societal benefits
The societal benefits of reducing early school leaving generally are translated into higher revenues (e.g. of taxation) or lower expenditure (e.g. on welfare benefits) in a range of domains. By taking this perspective on societal benefits, no distinction is made between the government, on the one hand, and broader society, on the other hand. This can also be found in the work of Belfield (2008), who assesses the impact of lowering the rates of ESL on the government or taxpayer as those benefits that follow from increased tax payment or reduced reliance on government programmes.[15] These benefits, of course, have to be weighed against public expenditure on educational subsidies (these would fall under societal costs). He describes the broad societal effects as all benefits of education, regardless of who is the beneficiary. Hence, this category would encompass all the private and fiscal benefits, including externalities as well as the social value of specific improvements. Still, even effects that are more difficult to quantify or monetise, like social cohesion, in the end are associated with increased revenues or decreased expenditure. For this reason, we do not follow Belfield (2008), but rather consider all effects that extend beyond the level of the individual simultaneously. We do, however, distinguish between effects in different domains, such as education or health.

Education: As was discussed in the literature review presented above, the educational benefits, at the societal level, of tackling early school leaving are reflected in less grade repetition, lower participation in special education or other programmes, etc. Moreover, reductions in the ESL rate result in a better educated workforce, which in turn has a positive impact on the labour market (e.g. improved matching, less skill mismatches), competitiveness and innovation, and economic performance and growth. The advancement in both the cognitive and non-cognitive skills of the population matter: as was explained above, cognitive and non-cognitive skills are closely intertwined and reinforce each

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[14] Note that there may also be unintended outcomes of a measure, which would also need to be accounted for, as they may be beneficial or not.

[15] In this regard, it is important to take into account the level of government being examined, the level at which a measure is introduced and the source of the funding to finance it.

other. What is most interesting about improvements in educational attainment is that education tends to serve as a lever for improvements in other domains. Since very little information is available in the RESL.eu project on the outcomes of the measures studied, as most youngsters were still enrolled in this measure at the time of the research, it is unclear how many students in the end obtained a degree or certificate. The exact impact of the measure is thus unknown, which means that its effects cannot be quantified.

Labour market: Labour market effects are linked to the changes in employability, wages and non-wage remuneration, productivity, incidence of unemployment or inactivity, and dependency on welfare, among other factors, which have an impact on the tax revenues that can be collected and the expenditure on welfare and support measures. The effect runs through multiple channels: increased participation in the labour market and improved conditions (e.g. wages). As was also hinted at above, labour market enhancements have large, positive economic consequences as well (not only in terms of competitiveness and growth but also poverty rates, e.g.). Besides these effects, it also has to be recognised that the education sector is an important employer in most countries. Within the RESL.eu project, due to a lack of data on the success of the measures in general and in terms of labour market outcomes specifically, these impacts unfortunately cannot be quantified in this paper.

Health: The societal benefits of reducing early school leaving also include a health dimension, in the form of lower expenditure on health care programmes (e.g. medicine, treatments, personnel, hospitals, equipment, etc.). For health, the same caveats apply as for the other categories.

Crime: Finally, societal benefits pertaining to crime also follow from reduced expenditure (e.g. expenditure on the criminal justice system, the police force, prisons and the punitive system, rehabilitation programmes, etc.), on the one hand, and the social value of reduced criminal activities, on the other hand. In addition, gains from reduced crime must be calculated to account for the product of cost per crime and incidence, victimisation costs and criminal justice system costs.

Individual benefits
At the individual level, there are a range of benefits that would follow from staying in education, rather than leaving school early. As in the previous section, the discussion below will mainly focus on the benefits linked to education, labour market, health and crime. A lack of data also on the benefits side makes it very difficult to provide quantifications in this section. Nevertheless, we highlight below the most interesting features of the selected measures.

Education: The benefits to an individual of remaining in school and completing education correspond to a higher educational attainment. In itself, this may appear to have little effect, but as was also pointed out above, education serves as a lever in other domains as well. All seven preventive and intervention measures studied aim to ensure that students finish their education. Some of these measures attempt to achieve this result by providing care and counselling, others focus more on ensuring that students can catch up academically, or concentrate on their transition into the labour market at a later stage. As each of the measures is set up within the school context, there is a much larger framework in place of which the specific measure is just one part.

Labour market: Improved labour market outcomes are among the most discussed advantages of reducing ESL at the individual level. Higher educational attainment is connected with higher participation in the labour market, improved labour productivity, which lowers the risk of being in unemployment and shorter duration of unemployment, less dependency on benefits and social assistance, higher employability, higher wages and non-wage remuneration, etc. at the individual level. For all these reasons, many ESL measures also focus on the connection to the labour market. The Spanish measure, Academic Orientation, for example, aspires to provide students with a good understanding of the options available to them after obtaining their degree.

Especially the gain in net earnings and wealth has been examined substantially (Belfield, 2008; Brunello and De Paola, 2013). ESL reduces lifetime earnings, while leading to a higher incidence and duration of unemployment. As a result, the expected net lifetime earnings go down, because participation in the labour market decreases; but also because the earnings in each period (at work, unemployment or retired) are lower.

Health: Another commonly studied effect is that on an individual's health. Also in this case, there is research available that highlights the relationship between education and health. Improved health status and increased life expectancy are among the key advantages. The availability of student counselling and a care structure, as found in the Belgian, Dutch, Polish, Portuguese, Swedish and English cases, is likely to have a positive impact on students' mental health and well-being.

Crime: Finally, there is a negative relationship between educational attainment and criminal behaviour, as captured by the number of arrests, the number of court cases, etc. Some of the measures examined in the RESL.eu project focus on behavioural issues and may have a larger impact on this variable than the other measures.

4.2.3 Cost-benefit analysis

As a following step in the analysis, one would need to discount all costs and benefits, and then calculate the individual and societal returns to education that are linked to the ESL measure and the corresponding reduction in ESL. This step cannot be completed for the RESL.eu project, but would be necessary to arrive at a conclusion on whether the policy measure is effective and efficient.

If the data were available, the analysis would be as follows:

For the individual (with benefits and costs discounted as explained above):

$$private\ benefits\ (direct\ and\ indirect) - private\ costs\ (direct\ and\ indirect)$$

From the perspective of the individual, participation in the ESL programme would be advisable if the benefits exceed the costs.

For society (again with discounted benefits and costs):

$$net\ monetary\ benefits = private\ benefits - private\ costs + societal\ benefits - societal\ costs$$

From the societal perspective, the ESL programme would be effective if the benefits are higher than the costs (i.e. if the programme leads to a reduction in early school leaving). The measure would be efficient if it achieves the same result as another measure, but for less resources.

4.3 Compensatory measures

In this discussion of the costs and benefits of the seven selected compensatory measures, we start from general concepts and then highlight specific examples or exceptions. While a detailed breakdown of each programme's costs would be included in a complete CBA, the following sections will progress through the steps of conducting a CBA using Poland's Youth Socio-Therapy Centre (YSC) as a guide. While the YSC is not a typical case, it is nevertheless informative and appropriate for this purpose as it: i) includes a number of cost elements that are absent in other programmes (e.g. housing, sports, therapy); ii) attempts to achieve several clearly defined outcomes;[16] iii) has detailed descriptions of the programme from previous work in the RESL.eu project; and iv) it achieves its benefits in a very broad and holistic manner. To expand on this fourth point, for example, rather than being a strictly vocational program, YSC incorporates general and vocational training, living facilities, counselling, individual therapy, etc.

Alongside the step-by-step CBA for Poland's YSC are elaborations of how the other compensatory programmes would be handled in a CBA. This method will be informative respecting the commonalities and differences between executing a CBA for different compensatory RESL.eu programmes.

4.3.1 Costs

On the cost side, the distinction is made between direct and indirect costs, and individual and society costs; with a focus on staff, equipment, infrastructure as well as foregone earnings.

Society - Direct Costs

The starting point for calculating the societal costs of a measure to tackle ESL are direct costs, i.e. costs linked to staff salaries, teaching equipment and other goods and services, and infrastructure. Put differently, the societal costs of the policy measure are linked to expenditure, for example in the form of public subsidies, on the measure.

Salaries

The first type of direct costs relate to the salaries of the staff involved. The staff involved can only be teachers, or can have much more diverse profiles, such as nurses, psychologists, social workers,

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[16] For example, in the case of the UK, the stated goal of the Bridging Course is to "get young people back where they want to be" with a full set of qualifications needed for further studies or successful employment, accomplished by providing that full set of qualifications as well as soft skills. Compared to the end goals of other programmes, the goals of the Bridging Course are more challenging to monetise.

counsellors, administrative staff and others. Salaries for each of these staff members may be radically different, not only within but also across the countries. Furthermore, some of the compensatory measures involve collaboration between different institutes.

Salaries are to be understood as wages, employer contributions for income taxes and social security, and other contributions. Since it is not always clear for the compensatory measure whether the centre had existed previously and whether staff had been hired for the implementation of the specific measure, we consider staff costs on a broader basis. This may lead to an overestimation of costs.

For the Polish YSC programme, the salaries of teachers in the primary centre, vocational teachers in the additional building complex, counsellors, sports instructors, supervisors who stay with the students 24 hours per day, and others (cooks, custodians, etc.) must be accounted for. It is not clear from available information what the ratio of staff to students would be, but estimates could be made. For 2015, Eurostat reports that Poland's ratio of pupils and students to teachers and academic staff for lower-secondary education was 9.7; for upper secondary, 10.3; for upper secondary (general), 11.9; and for upper secondary (vocational), 9.3 (Eurostat, 2017). It is likely, however, that in a programme like YSC containing many students with behavioural problems, substance abuse issues, and so on, a higher proportion of teachers and staff is necessary. Thus, salary costs are modulated not only by the number but by the specific needs of students and pupils.

In all compensatory measures, with the exception of Poland's YSC and the Netherlands' Talent for Care, salaries associated with 24-hour supervision could be excluded. With the example of Belgium's Modular System, additional salaries for a variety of teachers (specialised in human sciences as opposed to maths, for example) would need to be accounted for. In Spain's Joves per l'Ocupacio (JPO), academic teachers would be excluded from salaries altogether – only vocational teachers and tutors are relevant. For Sweden's even more focused Vocational Training Course, the salaries for specialised vocational teachers (e.g. teaching childcare, youth recreation, etc.) would be included, as well as requisite administrative and logistical support (e.g. in relation to setting up and managing the apprenticeship programme).Since Sweden's course takes place in a school, the additional salary requirements associated with building maintenance must be accounted for.

With the data from the RESL.eu project, we know that one particular YSC centre of the 76 in Poland[17] has 114 students, 84 of whom reside in the dormitory. Assuming a typical pupil-to-staff ratio for lower-secondary education, this particular institution would employ around 12 teachers and administrative staff. This figure, however, neither accounts for supervisors and other positions necessary for housing 84 students, nor for the higher proportion of staff that may be necessary with troubled youth.

If more information is available about the staff, however, it would be possible to calculate salaries based on recent salary data. The OECD (2017),[18] for example, reports the starting teacher salary in Poland at $15,000 (about €12,700), salary after 15 years at $25,000 (about €21,200), and the top of

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[17] As of 2015.

[18] The standards for international statistics on education are set by UNESCO, the OECD, and Eurostat. See http://ec.europa.eu/eurostat/statistics-explained/index.php/Educational_expenditure_statistics

the salary scale at $26,000 (about €22,000).[19] Using such figures would assume that teachers for this programme earn an average salary, constant across Poland, and similar assumptions must be made for the counsellors, sports instructors, and so on. We do know, however, that the YSCs employ extra specialists compared to the average educational facility, and that school staff qualifications are different than for teachers and tutors working in regular schools (and this also applies to some of the other measures studied).

This means that without receiving further data on actual salaries, averages could be used, but this cost calculation would be inaccurate because of likely false (but necessary) assumptions. Ideally, a cost-benefit analysis would have a list containing the number of employees, together with their functions and salaries, and student data. This would allow a far better understanding of programme costs, and would ideally be provided with a pilot project. Thus, the total annual cost for staff would be calculated as follows:

$$\# \: staff \: members \: of \: type * salary \: at \: market \: rate * share \: of \: expected \: annual \: hours \: dedicated \: to \: measure$$

$$\sum_{x=i}^{I} staff \: costs \: category \: x$$

In the case of staff salaries, a CBA should account for the 'true opportunity cost' of their time. This means if individuals working in a given educational context are paid less than the current market rate, the current market rate ought to be used rather than the actual salary paid. This gives a better indication of the 'true cost' of an individual's time.

Teaching equipment, other goods and services

Calculating teaching equipment and other goods and services is fairly straightforward. Computers, blackboards, textbooks, stationary, writing implements and other equipment need to be accounted for in tallying the cost. In the case of the Polish YSC measure, approximate amounts and costs per unit could be found through Polish administrative data. Additionally, in the YSC programme some students receive 500 PLN monthly (which is about €120), and the number of students receiving such a stipend must be known. Furthermore, the programme involves therapeutic and sporting activities. More details about the availability and implementation of these activities would be necessary to calculate their cost in terms of necessary equipment, facilities and staff. Thus, the total annual cost of teaching equipment and other goods and services would be calculated as follows:

$$\begin{aligned} Costs = \; & Costs \: of \: shared \: teaching \: materials + Costs \: of \: providing \: therapy \\ & + Costs \: of \: providing \: sports \: activities + Costs \: of \: other \: goods \: and \: services \\ & + (Average \: costs \: of \: individual \: teaching \: materials * number \: of \: students) \\ & + (\# \: students \: receiving \: stipend * 500 \: PLN) \end{aligned}$$

In programmes other than YSC, such as Portugal's Apprenticeship with Labour Insertion Guarantee, the costs would look considerably different. As a woodworking and furniture building programme,

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[19] Statutory salaries of teachers (typical qualifications) in general programmes at lower secondary education level, public institutions. 2015 USD at purchasing power parities (PPP).

tools, materials, and building facilities would be necessary. Calculating the cost of the programme itself, as opposed to that covered by partners (business associations, unions and others) would be necessary. The contributions of partners as well as the government must be tallied for societal costs. In the Apprenticeship with Labour Insertion Guarantee, similarly to YSC, students also receive subsidies during their attendance totalling €80 per month for travel expenses and lunch, and an additional €60 quarterly for the purchase of books and materials.

In the UK's Bridging Course, the terms of the partnership with Reed Employment Services (a major UK employment agency) may entail costs as well. Clearly the type of teaching (vocational, academic) and other services provided would vary a good deal from programme to programme, which would make very specific data about a given initiative imperative for executing a CBA.

School Buildings

For the school buildings, calculating the cost can be a bit more complicated. In the case that buildings are rented, then the annual (or otherwise periodised) rent can be used. However, most school buildings are not rented. In this case, the annual rent must be imputed. This is performed by allowing for the costs of capital services by calculating the annual amortisation of the building over its expected lifetime. This amortisation includes the annual depreciation of the building, and notional payment to cover interest charges (Woodhall et al., 2004). In essence, amortisation of assets (in this case school buildings) means allocating the cost of an intangible asset over a period of time. This requires its own treatment, but a number of methods are expounded in the literature, e.g. Cellini and Kee (2010) and Levin and McEwan (2001).

For Poland's YSC programme, the building costs would be substantially more expensive than usual, as it incorporates school buildings (for academic studies focusing on maths and language), facilities for sports and therapy, access to separate facilities for vocational training (practical learning centre), and dormitory housing. Also the Dutch measure would have this feature; although since most compensatory measures offer a combination of different types of training and counselling, it is likely that also there, costs related to infrastructure might be substantial.

Generally speaking, this type of meso-level data would have to be acquired through administrative data. It would also be important to know what the usage of each building is specifically. For example, if the Practical Learning Centre is used by other individuals outside of the YSC in Poland, then its cost would presumably be for periodical rather than continuous rental. Alternatively, the costs associated with dormitory housing are likely to be constant throughout the entire year.[20] Thus, the total annual cost of school buildings would be calculated as the sum of the annual rent or amortisation per building or facility.

In other institutional contexts, such as Portugal's Apprenticeship with Labour Insertion Guarantee, building expenses would have to account for access to an equipped wood shop and sufficient storage space, at a minimum. For programmes with a variety of vocational training courses, costs for access to appropriate facilities (garages, kitchens, etc.) must be accounted for. Given that Poland

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[20] Assuming at least some students stay during holidays, and that the facility is not rented out for other uses during such times.

has over 70 active YSC programmes, it is reasonable to assume that in different localities, the availability of buildings and cost of access to buildings and facilities is subject to a good deal of variation. If a suitable building is not available for use as a dormitory, vocational centre, etc., new buildings could be necessary, or at a minimum, additional arrangements would have to be made and monetised as appropriate. The most important measure would be the total financial burden on the government in accessing facilities necessary to implement a programme. As the selection of RESL.eu programmes demonstrates, partnerships with businesses (as in Spain's JPO) and social partners (as in Portugal's Apprenticeship with Labour Insertion Guarantee) could be a means of securing access to facilities and minimising the financial costs for governments. Nevertheless, the cost to partners must be included in calculating societal costs.

Society - Indirect costs

The indirect societal costs are the foregone earnings of students, or the amount of earnings an individual gives up when devoting time to studies rather than working in the labour market (München and Psacharopoulos, 2014). These costs are calculated after taxes, and the assumption must be that a student participating in the measure is unable to work during their studies. The earnings would be approximated by what a student would earn given their current educational status, which in this case would mean either i) no lower-secondary education or ii) lower-secondary education. It is important to note as well that not every student would have been eligible to work in any case (e.g. in some countries, like Poland, minors can also enrol who would not yet be allowed to work).

Foregone Earnings

As one example, the annual earnings for a Polish male in 2014, having less than lower-secondary education, was €8,416, while the figure stood at €10,023 for those having upper secondary.[21] Data for those having lower secondary but not upper secondary were unavailable, so an estimate based on available data would have to suffice. With these gross figures in hand, taxes would be calculated,[22] and then the net (after tax) salary would be multiplied by the number of working age students. Thus, the total annual cost of foregone earnings of students would be calculated as follows:

For each category (i.e. different levels of education):

$$\# \ working \ age \ students * average \ salary$$

Then, the sum of all these categories is made:

$$\sum_{x=i}^{I} foregone \ earnings \ x$$

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[21] Averages for all industries. This does not, however, weight industries by their actual percentage of workers.

[22] Approximately 20% of a gross monthly income of 3,000 Polish zloty (approximately €700) for an unmarried individual on an employment contract in 2014. See Eurofound.

In other institutional contexts, such as Belgium's Modular System, the Netherlands' Talent for Care or Sweden's Vocational Training Course, all students are of working age and this calculation would be simpler. Each nation and region's average net salary for a given education level must be known. Additionally, it must be assumed that not all students would have been employed if they were not in school. This means that the employment rate of an individual in a given region with a given educational level must be multiplied in the above equation as well, although this effect can be built into the CBA elsewhere and should not be counted twice.

For each category (i.e. different levels of education):

$$\# \ working \ age \ students * average \ salary * percent \ of \ annual \ working \ hours \ lost$$

Then, the sum of all these categories is made:

$$\sum_{x=i}^{I} foregone \ earnings \ x$$

Finally, in a context such as Belgium's Modular System, the intent is that students can complete courses piecemeal. This means that the assumption that a student cannot work while completing studies would probably not hold, and additional calculations would be necessary. For example, if the average student works 20 hours per week, then the average net salary for a part-time rather than full-time position could be more appropriate. The easiest way to calculate this is hours lost, as is illustrated in the above equation.

Individuals - Direct Costs

The direct costs for individuals (students or their parents) are relatively simple in comparison to societal costs. The two primary costs in the literature are tuition and incidental expenses associated with education.

Tuition and fees

Considering that compensatory measures are typically organised in alternative learning arenas, tuition or registration fees might be in place. Similarly, in some cases, students may need to pay a fee to be able to participate in a certain exam. Some students, however, may be eligible for subsidies or scholarships, which then must be subtracted from the tuition fee and other expenses made.

Incidental schooling expenses

Incidental schooling expenses might be books, writing utensils and anything else that students would need to provide for themselves for their education (e.g. rent for a room). Again, the average cost of incidental schooling expenses or a best estimate would be multiplied by the number of students. Thus, the total annual direct costs for individuals would be calculated as follows:

$$(\# \ of \ students * (annual \ tuition - scholarship)) + (\# \ students \ in \ dormitory * rent)$$
$$+ (\# \ students * \ average \ costs \ of \ incidental \ schooling \ expense)$$

Clearly, the exact manner of acceptance into an institution and paying for admission will heavily alter the level of the expenses. Additional fees (e.g. registration fees) must also be included in the direct costs to individuals, if relevant. If a student must provide specific materials, e.g. tools for vocational training, these costs would be factored into the incidental schooling expenses.

Individuals - Indirect costs

The indirect costs at the individual level are calculated in the same way as outlined in the section "Society - Indirect costs".

4.3.2 Benefits

When it comes to the benefits of reducing early school leaving from compensatory measures, a similar conclusion is reached as for the prevention and intervention measures, in terms of data availability, methodological challenges and other caveats. To avoid redundancies, this section will only present the highlights on the benefits sides of the compensatory measures. When it comes to the benefits of the compensatory measures, it is important to recall that these measures are often applied to a smaller group of students than preventive and intervention measures (which often are, at least to partially, school-wide). Nevertheless, the individual and societal costs of early school leaving are high.

Societal benefits

Societal benefits are linked to the increased revenues and reduced spending in a number of areas, such as education, work, health and crime. Depending on how the specific measure is implemented and how successful it is, the positive impact on revenues and spending will differ. Considering that these measures are compensatory measures, not all may have the aim to ensure that individuals obtain a certificate or degree. Some may be focused on basic skills and competencies, while others may aim to tackle labour market challenges instead. As before, when a measure would result in higher educational attainment, this would have a positive effect on other domains as well, including the labour market, health and criminal behaviour. Most of the compensatory measures examined in this paper have a vocational focus, which may be a good strategy in terms of the demand for such skills in the labour market.

Individual benefits

Besides the societal benefits, the individual benefits of completing education are again translated into a higher level of educational attainment, better labour market conditions, improved health and less criminal behaviour. The emphasis on counselling that can be found in many measures is likely to have an important contribution to each of these domains.

4.3.3 Cost-benefit analysis

Like for the policy measures inside regular secondary education, the following step in the analysis would involve discounting all costs and benefits and calculating the individual and societal returns to education linked to the measure and its impact on ESL This step cannot be completed for the

RESL.eu project, but would be necessary in order to determine whether the policy measure is effective and efficient.

Should the data be available, the analysis would be as follows:

For the individual (with benefits and costs discounted as explained above):

$$individual\ benefits\ (direct\ and\ indirect) - individual\ costs\ (direct\ and\ indirect)$$

From the perspective of the individual, participation in the ESL programme would be advisable if the benefits exceed the costs.

For society (again with discounted benefits and costs):

$$net\ monetary\ benefits = private\ benefits - private\ costs +\ societal\ benefits - societal\ costs$$

From the societal perspective, the programme would be effective if the benefits are higher than the costs; it would be efficient if it achieves the same result as another measure, but for less resources.

5. Discussion and conclusions

Decreasing the rates of early school leaving has been a policy priority in the European Union at least since 2010, when the Europe 2020 strategy was adopted. Reducing the share of early school leavers to below 10% is one of the headline targets of this strategy. In 2010, some Member States were already close to meeting this target, while others were far from achieving this objective. A number of Member States have already surpassed this target and have set even more ambitious national targets. Others, still, have a long way to go.

When it comes to early school leaving, it is important to recall that this is a highly complicated issue, characterised by substantial heterogeneity among the students who leave school early. This makes ESL a difficult challenge to tackle. Yet, the consequences of early school leaving are severe as well as longstanding. They reach beyond the level of the individual, and also affect society at large. For this reason, EU Member States have implemented a range of strategies to tackle ESL. In order to determine what policy measures to implement, governments can fall back on cost-benefit analysis to identify which policy options promise benefits that surpass their costs, and which policy option offers the largest difference in the costs and benefits. Accounting for the costs and benefits of a policy option has merit, because government resources are scarce. Cost-benefit analysis can, therefore, be a helpful tool. That being said, especially in cases where costs and benefits are difficult to quantify, it is likely that cost-benefit analysis alone will not provide sufficiently reliable data on which to arrive at a conclusion. Other techniques to select and compare policy options should, then, also be considered.

The purpose of this study was to explore the possibilities of performing a cost-benefit analysis of preventive, intervention and compensatory measures aimed at reducing early school leaving, examined in light of the RESL.eu project. The aim of this paper was not to perform a cost-benefit analysis, but rather to reflect on the possibilities to do so, as well as the challenges that one would need to overcome in doing so. In this way, the study aspires to inform policy-makers and researchers looking to do a cost-benefit analysis for early school leaving policy measures.

Performing a cost-benefit analysis is a complex, but informative exercise, but one that comes with methodological and data challenges. Especially the latter prove to be a major obstacle, as cost-benefit analysis is very data-intensive – requiring data on different topics and levels, which stretch out over a sufficiently long period of time. Collecting such data retrospectively is also very difficult, rendering the research design of the project of critical importance to its ultimate utility.

This latter point is also clearly underlined in the RESL.eu project: despite the rich data available, crucial information on some topics, levels and timeframes is missing. Data requirements need to be integral and central part of the initial research design. If this is not possible, then a careful reflection is needed on the scope and purpose of the cost-benefit analysis. For example, an analysis could be restricted to one domain only, or to the level of the individual. On the other hand, it is very difficult to predict all data required at the start of a research project. It is, therefore, important to strike a balance between these two factors. Other research that used cost-benefit analysis in the context of early school leaving has addressed some of the methodological and data-related challenges by limiting the scope of the analysis in terms of the timeline considered or the outcomes accounted for. Such an approach seems more viable than applying a comprehensive cost-benefit analysis. Depending

on the objectives of the analysis, however, this is not necessarily problematic. Setting clear, specific goals and planning the research so that data and methodological challenges can be overcome is key to the success of the exercise.

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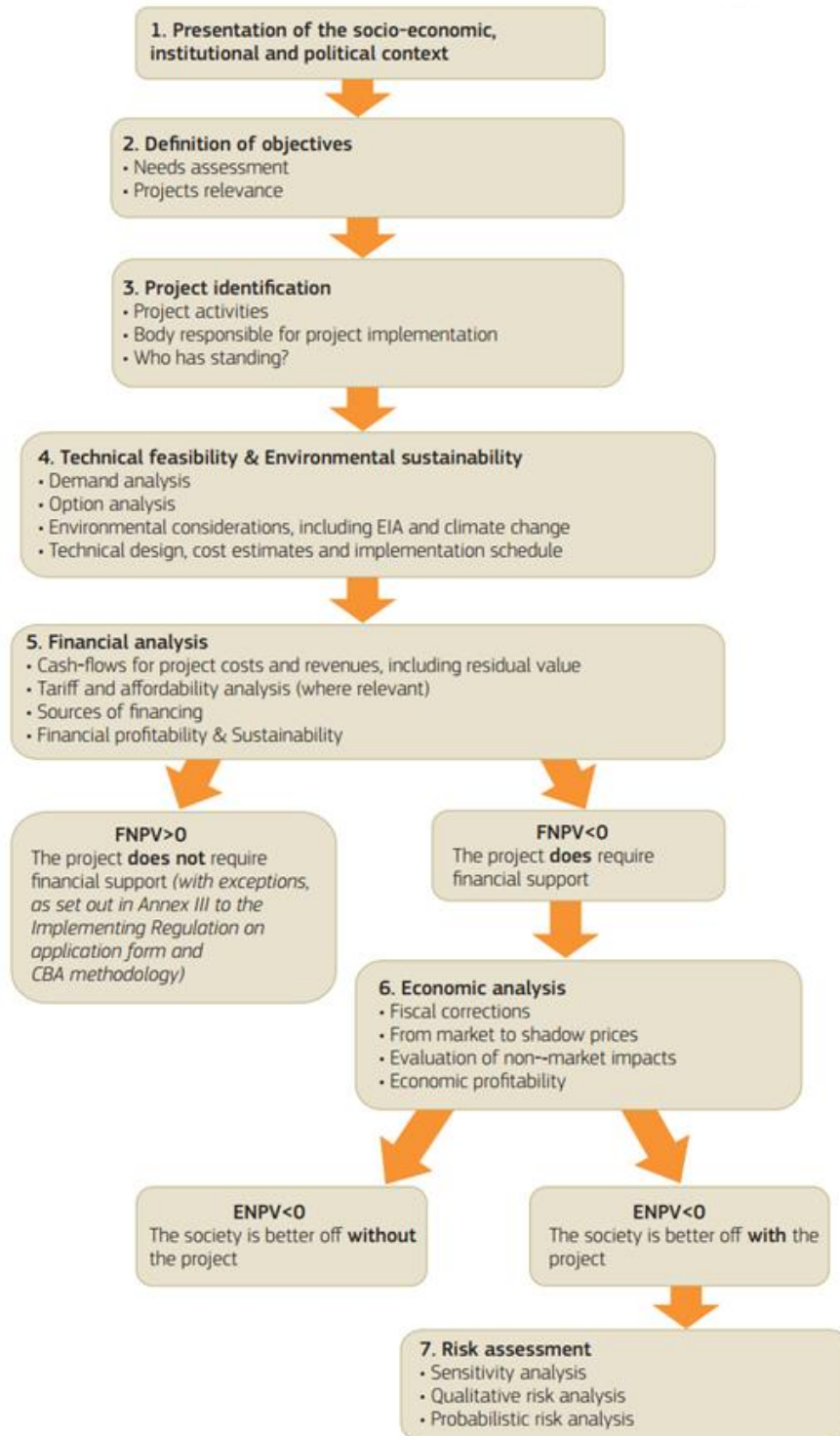
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Annex

Annex A – Illustration of the steps to follow in a cost-benefit analysis

Figure 1: Steps of the Cost-Benefit Analysis Appraisal

Note: In this figure, NPV stands for net present value. ENPV stands for economic net present value, FNPV stands for financial net present value.
Source: Sartori et al. (2014)

Annex B – Example of preventive, intervention and compensatory measures classification taxonomy

Table 6 shows an example of the taxonomy for Spain's intervention and prevention measures, called Orientation, whereas Table 7 outlines the taxonomy for Poland's compensatory measure, called the Youth Socio-Therapy Centre (YSC).

Table 6: Spain's Orientation

What are the measure's specific provisions	General education	Vocational training	Counselling and care	School-wide or student-focused
	Yes	**Yes**	**Yes**	**School-wide**
Who does the measure target?	Age	Gender (m/f/both)	Applicants (all/some)	Referrals (all/some)
	Unclear	**both**	**Unclear**	**Unclear**
What is the objective?	Educational Outcome		Other	
	Complete education		**Transition into higher education or labour market**	
How is the measure implemented?	Funding (public, private)		Structure (collaboration, single institute, regular school, residence)	
	Unclear		**Regular school**	

Table 7: Poland's Youth Socio-Therapy Centre Taxonomy

What are the measure's specific provisions	General education	Vocational training	Internship	Counselling
	Yes	**Yes**		**Yes**
Who does the measure target?	Age	Gender (m/f/both)	Applicants (all/some)	Referrals (all/some)
	13-24	**m**	**Unclear**	**Unclear**
What is the objective?	Labour Market		Educational Outcome	
	Vocational certification in cooking (optional)		**Completed lower secondary education** **Completed upper secondary education**	

How is the measure implemented?	Funding (public, private)	Structure (collaboration, single institute, regular school, residence)
	Public	**Managed by city hall and the Bureau of Education. Provides dormitories for 84/114 students. Vocational training courses (cooking only) in separate facility.**