



EC-ILO Action on youth employment policy – Youth Guarantee

A literature review of the main elements for a social-cost benefit analysis of Youth Guarantees



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Preface

The aim of this paper is to review the current literature relating to social cost-benefit analysis (SCBA) with a view to developing a methodology for the assessment of youth employment policies and, more specifically, the Youth Guarantee (YG).

This literature review was conducted in conjunction with the development of the paper that analyses main elements of a SCBA of youth employment policy that was commissioned by the ILO to the Institute of Employment Studies (IES) of Brighton (UK). Both papers were used for the design of the ILO's learning modules for capacity development programme for senior management of YG schemes. This material was validated during a learning exchange programme that took place at the International Training Centre of the ILO in Turin (Italy) on 12 and 13 July 2017. Gratitude is expressed to the members of the national YG coordination teams of Latvia, Portugal and Spain - who participated in the learning exchange and validation workshop - for their useful comments.

This paper is a deliverable of the joint Action of the International Labour Organization (ILO) and the EC that supports the implementation of the YG. It was compiled by Sergio Destefanis, Professor of Economics at the University of Salerno (Italy). Besides reviewing existing literature, this paper draws on the above-mentioned paper of the IES and on previous work of the ILO. The development of this paper was coordinated and backstopped by Mr Gianni Rosas, Senior Employment Specialist of the ILO, and the various drafts received much appreciated comments by Ms Valli Corbanese, Senior Youth Employment Expert, Mr Niall O'Higgins, Senior Youth Employment Specialist of the ILO, and Mr Gianni Rosas, ILO's Senior Employment Specialist and Director for Italy and San Marino. Ms Rosette Opiyo of the ILO's Youth Employment Programme assisted in the design and layout of the paper.

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¹ For further information please consult: <http://ec.europa.eu/social/easi>

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1. Introduction

This background paper provides an analysis of existing literature on conducting a Social Cost Benefit Analysis (SCBA) of the youth employment interventions of the European Union (EU) Youth Guarantee (YG).² The aim is to identify the costs and benefits that are likely to be generated by the YG interventions and provide insights on the elements to be included in SCBA estimates. Particular attention is paid to the need for expanding the assessment of youth employment interventions beyond the traditional economic variables that are considered in impact assessment.

In order to provide further structure to this paper, a distinction is made between direct (related to YG participants) and indirect effects (related to firms, education and training institutions, public institutions or other members of society) and their time profile (during the intervention, in the short and long term). These indirect effects include substitution, deadweight loss and multiplier effects.

Table 1 summarizes the direct and indirect costs and benefits that may be considered for conducting a social cost-benefit analysis of YG interventions. It highlights the elements that are more relevant and measurable, particularly in monetary terms. For each of these elements, the following sections provide a review of the findings from literature and describe the rationale for their inclusion or exclusion from SCBA estimates. For the variables that are amenable to quantification, the appropriate valuation methods and data sources are indicated.

In the estimation of social costs and benefits, a key decision relates to the prices to be used. Actual market prices should only be used in competitive markets without externalities or other imperfections. When markets are imperfect or non-competitive, shadow prices that reflect the social opportunity costs of goods and services should be used. This means that benefits should be estimated on the basis of “willingness to pay” and costs on the basis of “social opportunity cost”. For many social costs and benefits, this may require the use of estimation methods based on hedonic regressions.³ When the estimate of costs and benefits is not clear-cut and univocal, it is necessary to carry out a sensitivity analysis to weight the outcomes of different analytical decisions.⁴

This literature review is structured as follows. Section 2 and Section 3 examine the most relevant and measurable social benefits and costs deriving from the implementation of the Youth Guarantee and highlight estimation approaches and data requirements. Section 4 examines discount rates and distributional weights. Annex 1 reviews available estimation models that may be considered for running a SCBA of the Youth Guarantee. Annex 2 offers some examples of sensitivity analysis.

² The EU established the YG with the Council of the European Union Recommendation of 22 April 2013 (2013/C 120/1). It aims to ensure that all young people under 25 years of age receive a good quality offer of employment, continued education, apprenticeship or traineeship within four months of becoming unemployed or leaving school.

³ A hedonic regression measures the value of each component of a composite good or service (examples of it range from labour services to house prices).

⁴ Sensitivity analysis refers to a set of techniques that test the robustness of the results of a model or system in the presence of uncertainty. It estimates the change in the output of a mathematical model or system (numerical or otherwise) in response to a change in its more uncertain inputs.

Table 1: Costs and benefits of Youth Guarantee measures

BENEFITS		
	Item	Description
Direct effects	Employment income	The YG is expected to increase employment opportunities for young people and the main benefit accruing to participants is job-related earnings.
	Avoidance of “scarring”	Unemployment or inactivity early in one’s career may have a long-lasting negative impact on employment and earnings (“scarring”). The benefits of the YG can be thought as the avoidance of scarring for young participants.
	Returns to education	Continued education and training measures are likely to result in increased lifetime earnings for young participants.
	Employment security	The YG requires that young people be provided with “quality” offers of employment. A key element of job quality is security. The benefits of the YG can be thought as lowering the potential costs of employment insecurity.
	Health	Getting a job or a training place is expected to improve individuals’ well-being and health. These effects may go beyond job-related financial rewards.
	Anti-social behaviour	Having a job or achieving additional qualifications may reduce the probability of anti-social behaviour among young people at risk and the likelihood of experiencing lower earnings in future.
	Social inclusion	Aside job-related earnings, the YG may increase social connections and life satisfaction, which has a direct bearing on social inclusion.
	Gender segregation	A reduction of gender segregation would lessen young women’s exclusion by reducing their distance from job-related social networks, which results from discrimination.
Indirect effects	Output multiplier	Government spending on the YG results in higher disposable incomes among young workers. Since young people have a high marginal propensity to consume, this impact aggregate demand, resulting in a ‘multiplier’ effect.
	Returns to firms	Because of labour market imperfections, the marginal product of young employees may be greater than the value of the wage they receive.
	Returns to government	These benefits include increased income tax and social insurance contribution revenues and lower social security outlays.
	Public sector efficiency	The YG calls for greater flexibility in policy management, enhanced local governance arrangements and partnership approaches. This may have a direct impact on public sector’s efficiency.
COSTS		
Direct effects	Programme costs	Costs associated with the delivery of YG interventions (direct programme costs, costs of structural reform or building the capacity of public institutions).
	Opportunity costs: travel and care	Young people who are employed or re-engaged in education or training as a result of the YG may have to incur travel and care costs, which reduce the real gains of participation.
	Opportunity costs of education	This refers to earnings that young people who could have found a job in the absence of the YG, forego to participate to a continued education or training measure.
Indirect effects	Substitution effects	Like other youth employment interventions, YG measures may entail deadweight (the participants would have found a job even in the absence of the measure) and substitution effects (jobs created for subsidized workers replace unsubsidized jobs).
	Deadweight loss of taxation	The increase in taxation needed to fund the government expenditures associated with the YG may distort individual behaviour and reduce economic surplus, creating what is usually referred to as deadweight loss of taxation.

2. Social benefits

The Youth Guarantee envisages that all young people under 25 years of age receive a quality offer of: (i) employment (job subsidies, self-employment and direct job creation); (ii) continued education and training (leading to a recognized qualification for either further education and training or labour market entry); (iii) apprenticeships, or (iv) traineeships. The literature usually divides active labour market policies (ALMPs) into four categories: private sector job creation measures (wage subsidies and start-up grants), direct employment programmes in the public sector, training programmes, and services and sanctions (counselling and guidance, job search assistance, job search monitoring and sanctioning).

An employment offer under the YG includes private sector job creation measures and direct employment programmes, while an offer of continued education relates to enhancement of human capital, and hence to training programmes. The literature considers apprenticeships as a special category of training programmes, while under the YG apprenticeship is considered part of the formal education system. In practice, apprenticeship-type programmes under the YG are expected to have the same outcomes of continued education and training pathways. The evidence on the labour market outcomes of traineeships linked to ALMPs is scant; the only recent impact evaluation is the one carried out in Ireland on the *JobBridge* programme (Indecon, 2016). Services and sanctions do not constitute valid offers according to the guidance issued by the European Commission (European Commission, 2015). Yet, these services entail costs and accrue benefits (when they result in employment or enrolment in education, apprenticeship or traineeship) and need to be accounted for.

There are various authoritative surveys that compare the relative performance of private-sector or direct job creation with training programmes. In European Union (EU) countries, effectiveness differs by type of programme (Kluve, 2010). Traditional training programmes have a modest likelihood of generating a significant impact on employment. Both private sector incentives and services and sanctions perform better (the probability of positive impact is 30 to 50 percentage points higher). Direct employment programmes are less likely to have a positive impact on employment. Overall, ALMPs are more likely to be effective in a slump and this result is particularly robust for training. Programmes targeting young people are significantly less likely to be effective. Evidence from the United States indicates that classroom-based and on-the-job training, which can be effective for adults, is not effective for out-of-school young people (Barnow and Smith, 2015). The exception to this finding is *Job Corps*, which is an intensive, residential training programme for teenagers and young adults. This programme has small, positive impact on employment, and modest positive earnings effects after four years; the effects are strongest and most persistent for the oldest participants (Schochet et al., 2008).

The mixed evidence on training programmes targeting young people should be considered in the context of complementary education policies. The findings of research on career and vocational education as well as supplemental programmes that target young people still in school are generally more positive. This suggests that investments should focus on young people at risk before they leave school. Career Academies, for example, which provide high school students with occupational training and work experience, confer significant long term earning benefits (Kemple, 2008).

The evidence available from the United States also suggests that apprenticeships are a promising way to help workers build earnings capacity.

Apprenticeship programmes were found to yield large and positive earnings effects in Washington State (Hollenbeck and Huang, 2006). Individuals who complete a registered apprenticeship earn substantially more over the course of their careers than their peers who attend other education pathways (Reed et al, 2012). Since international evidence on the impact of training programmes targeting young people is not encouraging, apprenticeships that provide skills and work experience could be a valuable alternative (Scarpetta et al., 2010).

Impact evaluations of traineeship programmes organized as part of ALMPs are scarce. Recently, an impact evaluation was conducted on *JobBridge*, the Irish internship scheme that offers unemployed people six to nine-month placements in private, public or non-governmental organisations. The evidence shows that the programme increased by 32 per cent the probability of finding work (Indecon, 2016). Given these results, traineeship offers will be treated in this review in the same way of employment offers.

A recent meta-analysis of ALMP evaluations highlights four main conclusions (Card et al., 2015). First, ALMPs have relatively small effects in the short run (less than one year after the end of the programme), but larger positive effects in the medium (one to two years) and longer term (two years and more). Second, the time of impact varies by ALMP type. Job search assistance and sanctioning that emphasize "work first" have relatively large short-term effects. Training and private sector employment programmes have smaller short-term effects that increase in the medium- and long-term. Public sector employment has negligible or even negative impact at all time horizons. Third, average impact varies across groups, with larger effects for women and long-term unemployed persons and smaller effects for older workers and young people. Employment services and sanctioning appear to be relatively more successful for disadvantaged individuals, whereas training and private sector employment tend to work better for the long-term unemployed. Finally, ALMPs have larger impacts in periods of slow economic growth and higher unemployment.

The evidence on the impact of ALMP on employment quality is scarce. Available evidence shows that job search assistance (particularly counselling and guidance) may help young people enter employment of higher stability (Caliendo and Schmidl, 2016). The duration of programmes needs to be sufficiently long for these schemes to be effective; programmes whose immediate impact appears to be rather modest may show more significant effects in the longer run (Bördös et al., 2017).

In recent years there have also been attempts to measure the effectiveness of ALMPs and activation strategies targeting young people. Subsidized temporary employment is not necessarily a good bridge into regular employment as it can lead to repeated fixed-term contracts, particularly in segmented labour markets and when training is not part of the package. Subsidized employment should be combined with job-related training in private sector enterprises to increase participants' labour market prospects (Eichhorst and Rinne, 2015).

Activation strategies are likely to be more successful in less developed institutional and economic settings, possibly because they are particularly helpful for low-skilled, low-income population groups (Eichhorst and Rinne, 2015; Kluve et al., 2016). In high-income countries, the type of intervention is less decisive. However, there is strong evidence that the combination of multiple interventions is effective. Programme performance is also found to depend on the existence of well designed profiling approaches and robust monitoring systems.

The findings of literature provide insights in the likely labour market outcomes of YG interventions (summarized in Table 1). Beside their straightforward impact on job-related earnings and their subtler impact on job security, the YG measures are expected to reduce poverty and social exclusion, whose costs for society include health (physical and mental) and anti-social behaviour. These costs are associated with increased spending on public services, such as social care, benefit payments, social housing, healthcare, police and rescue services (Bramley et al., 2016). Improvements in social inclusion and wellbeing go beyond the effects considered above, given the definition of social inclusion adopted by the European Union (European Commission, 2004). Social inclusion is a

process that ensures that those at risk of poverty and social exclusion gain the opportunities and resources necessary to participate fully in economic, social and cultural life and to enjoy a standard of living that is considered normal in the society in which they live. It ensures that they have a greater participation in decision making, which affects their lives and access to their fundamental rights. By providing young people at risk with employment, continued education and training, apprenticeship and traineeship opportunities, the YG is likely to have an impact on the factors that determine social exclusion.

Also, the employment (and in the longer term the higher educational level) of a large number of young people who are currently neither in employment, nor in education or training (NEET) is expected to accrue benefits the rest of the society. The government benefits from higher income tax and social insurance contribution revenues, and from lower social security outlays. Firms are expected to benefit from higher employment and productivity because, due to market imperfections, the marginal product of some workers exceeds their marginal revenue product and, hence, their wage rate (Manning, 2011). Furthermore, the members of society are going to take advantage from the YG through income-expenditure multipliers.

2.1 Employment income

The YG measures aim to provide young people who are currently NEET with quality employment opportunities. Once this occurs, these young people are going to enjoy a higher income, start paying income taxes and social insurance contributions and they will receive lower social security benefits. The time profile of these effects derives from the results of impact research (Card et al. 2015). The fact that the transactions relating to taxes and social security payments are a transfer to and from government shall be taken into account later on.⁵

Young people who get an employment or a traineeship offer as a result of the YG will enjoy an increase in their labour income. This direct, short-term effect of the YG can be computed as the product of the number of young people who are employed or in a traineeship thanks to the YG, their average gross annual earnings and the average duration of the intervention (expressed in years). This measure should be estimated separately for men and women and by level of educational attainment of young participants. The estimation by type of intervention (employment or traineeship) may not be feasible for trainees, as the sample size may not be large enough. In some EU countries, this measure can be constructed wholly on the basis of administrative data. Most countries, however, do not collect consistent data on the incomes of employed participants. Measures for the money income of young people can be derived from national or EU datasets (Survey of Income and Living Conditions, EU-SILC), distinguishing between those who are in paid employment or in a traineeship.

The labour market integration measures of the YG (i.e. moving young people into employment, continued education and training, apprenticeships or traineeships) are expected to have long-term effects, beyond the period when young people benefit directly from the interventions.

A prolonged period of unemployment or inactivity early in a career may have a long-lasting impact on future employment and earnings (“scarring”). Early unemployment spells are likely to

⁵ A transfer is taken to mean a zero-sum money transfer between two parties (for instance if social security benefits are reduced, the sum lost by programme participants is gained by government in the same transaction).

deteriorate skills (both cognitive and non-cognitive) and to produce negative signalling effects for perspective employers, with a potentially adverse impact on future employability and wages (Burgess et al., 2003; Scarpetta et al., 2010; Bell and Blanchflower, 2011). The empirical literature suggests a scarring effect in various countries (Arulampalam, 2001; Gregg and Tominey, 2004; Mroz and Savage, 2006; Cockx and Picchio, 2013). The YG, by shortening unemployment, will have the benefit of reducing its long-term negative effects on both employment and earnings prospects of young people.

The model used by Mroz and Savage (2006) may be useful to value scarring effects, as it deals both with wages and employment effects on young people in their early 20s, the main target population of the YG, and relies on a relatively simple approach. Its main limitations are that this study was conducted on United States data only, and that the definition of “non-employment” used in the model includes both unemployment and inactivity. This analysis does not readily lend itself to the computation of scarring effects for EU countries and to the separate treatment of unemployed or inactive participants. Yet, given the relative simplicity of the empirical framework, it could be adapted to data from the EU-SILC and the Labour Force Survey (EU-LFS). Since scarring effects can be accounted only through a particular model of the economy, it is suggested to make allowance for them only in the sensitivity analysis.

In practical terms, the long-term impact of the YG on total labour income at year t can be expressed as the difference of the labour income of unscarred and scarred individuals, where the latter is obtained as the product of the average employment rate and average annual earnings (conditional on being employed) of scarred individuals. Both these averages can be calculated by proxy of employment and earnings of individuals not treated by the YG, which can be obtained from EU SILC data collected before the implementation of the YG. The labour income of unscarred individuals can be obtained by dividing the labour income of scarred individuals by the scarring effects on employment and wages (as percentages of the employment rate and earnings of unscarred individuals). Estimates of these scarring effects, which decline as time elapses, can be obtained from the literature (e.g. Mroz and Savage, 2006). The present value of individual lifetime costs from the scarring effect (in the absence of YG) can then be calculated as the discounted sum of the long-term impact of the YG on total labour income for every year following the YG intervention.

By providing young people with paid employment or a traineeship, the YG can avoid these scarring effects on perspective employment and wages. From econometric estimates available in the literature or from direct estimation (on EU-SILC or EU-LFS data), this effect is projected into future earnings by making customary assumptions about income growth and discount rate.⁶ It can be conveniently written as:

$$\text{Number of changes in labour market status (due to YG)} \times \text{lifetime discounted returns from lack of scarring}$$

⁶ Discount rates are discussed in Section 4. They are used in computing the present value of future money flows relating to social projects. The idea is that people prefer to enjoy their income now rather than in the future. Postponing the enjoyment of income has psychological costs and is subject to uncertain events that may thwart future consumption.

2.1.1. Long-term effects of continued education and training

YG offers of continued education (and training) are not expected to increase job-related earnings while participants are engaged in the programmes, but they are likely to do so in the long term (Card, 1999). Higher education attainment may also generate positive externalities. The time profile of these effects proceeds from the results in Card et al. (2015), and are based on the reasoning that education takes a longer time to affect employment income than other types of offers.

According to standard labour economics, the economic benefits generated by improved educational attainment brought about by the YG can be derived by aggregating the estimated increase in individual lifetime earnings of participants whose qualification increased as a result of the YG (subject to discounting and further adjustments). However, these benefits are likely to differ from aggregation of individual lifetime earnings for various reasons. Individual earnings may underestimate the full return to education because of market imperfections (mobility barriers, firm specific human capital, and imperfect competition). Not allowing for these effects would underestimate the aggregate benefits of education. In addition, as an increasing proportion of the working population gain higher levels of education, the returns to education may fall. As a result, understanding the full economic benefits of higher levels of education would require a macroeconomic approach that allows for externalities and saturation effects. The lack of appropriate data makes the estimation of a macroeconomic model that relates the education level of the population to output rather difficult. Hence, and despite its limitations, the simple aggregation of individual returns from education could be used to compute the value of the long-run benefits arising from higher levels of education achieved through the YG. Another restrictive hypothesis of this approach is that the returns to education do not change over time.

In light of the above, it is suggested that the valuation of the long-term benefits arising from higher levels of continued education be made through the aggregation of individual returns. In recent years, a number of studies have estimated returns to education in EU countries. For instance, Badescu et al. (2011) estimated the returns to education in 24 European countries using data from EU-SILC, following a standard Mincerian set-up where earnings are a function of education, training and work experience and controlling for a number of individual characteristics. The measure of education attainment should reflect the outcome of the YG in terms of the additional qualifications generated. The individual level data of the EU-SILC contain suitable information about these variables, as well as about individual controls. In particular there is good information in EU-SILC on parental background (parents' education level, financial situation and tenancy status of the household).⁷ The EU-SILC data also allow estimating separate regressions for men and women, a procedure justified by the significant differences in the returns to education between men and women.

Once individual returns to education have been estimated, lifetime returns to education can be computed as follows. Assuming that the qualification gained from YG participation is upper secondary education for young people with lower secondary education, the present value individual earning profiles from the YG up to retirement can be derived from the Mincerian coefficients for upper secondary education and work experience. The aggregate benefits from continued education are obtained as the sum of the above-mentioned individual earning profiles over individuals and levels of

⁷ A vexed question in the estimation of Mincerian regressions relates to the lack of suitable proxies for individual ability in the EU-SILC. Card (1999) points out, however, that the bias from omission of individual ability is usually rather small. Another estimation issue relates to the fact that the very probability of having a job, and hence observing a wage, depends on educational attainment, which is likely to bias Ordinary Least Squares (OLS) estimates. A Heckman selection model could be implemented to deal with this problem.

educational attainment. This effect is projected into a stream of future earnings making customary assumptions about income growth and discount rate.

N. of changes in qualification (due to YG) ×
lifetime discounted returns from educational attainment (compared to previous qualification)

In England, for example, the benefits on employment income stemming from the *Youth Contract* – which provides intensive support to 16-17 year olds to increase their participation in education, apprenticeship or employment – were estimated at £45,6 million for the 11,144 participants (Nafilyan and Speckesser, 2014).

2.2. Employment security

The YG requires that young people be provided with “quality” offers. A key element of job quality is job security (duration of contract and insurance against unemployment). The effects of job insecurity on workers and firms have been extensively investigated (Green, 2009; Green, 2015; Benito, 2004; Erlinghagen, 2008). Labour market insecurity has detrimental effects on individual well being, health (physical and mental illnesses caused by stress-related uncertainty), family life and future earnings. The implications of insecurity may also extend to firms (reduction of workers’ retention rates and loss of productivity) and society, as it affects consumer confidence, household consumption and saving behaviour (Ashford, Lee and Bobko, 1989; Erlinghagen, 2008; Green, 2011; Campbell et al., 2007; Hijzen and Menyhert, 2016). Typical measures of employment insecurity are job loss rate (extent to which workers experience involuntary job separations) and the cost of job losses (or the decline in earnings due to the job loss). Evidence from the United States shows that these losses may be substantial; they amount to an average of 1.4 years of (pre-displacement) earnings if the national unemployment rate is below six per cent and to 2.8 years of earnings when the unemployment rate exceeded eight per cent (Bertaux and Queneau, 2011).

The benefits of the YG in terms of job security can be thought as a reduction of the potential costs of job losses for young participants (or earnings saved thanks to quality employment offers). The measures proposed to appraise the quality of offers in terms of employment security are contract duration and access to labour protection entitlements (ILO, 2017). These can be estimated as the product of the number of young people who are employed or in a traineeship thanks to the YG, their average gross annual earnings and the average duration of the intervention (expressed in years).

Clearly, information about the actual duration of the contracts offered to YG participants is of crucial importance (administrative data on YG implementation). In principle, both contract duration and access to labour protection entitlements should be compared vis-à-vis the relevant regulations applicable in the country.

2.3. Health

There is a substantial body of evidence that shows that people in employment are on average healthier than people not in employment (Jahoda, 1982). There is a strong association between unemployment and poor health also when controlling for various individual characteristics. Recent empirical studies have also made clear that this correlation is to some extent explained by unemployment inflows, which bring about a worsening in health (O'Higgins, 2017). Unemployment in one year is associated with twice the risk of having a limiting illness in the next year (Bartley et al., 2004). Thomas et al. (2005) find that entering either unemployment or long-term sick leave (from paid employment) increases psychological distress. A recent study (McGee and Thompson, 2015) shows that unemployed young people are more than three times as likely to suffer from depression than their employed peers.

This evidence, however, tends to underestimate the relation between labour market status and health for young people on at least two accounts. First, it relies on administrative data that do not capture undiagnosed health problems that are likely to affect people entering unemployment. Moreover, the selection problem potentially affecting this body of research (people in poorer health are more likely to be unemployed) is likely to be less strong for young people than for other age groups, as self-developed health problems ought to be more prevalent among older individuals. Hence, the literature suggests that youth unemployment has a detrimental effect on physical and mental health. Not allowing for these effects of the YG implies a possibly severe underestimation of its benefits.

YG interventions in the field of continued education are expected to increase labour-related earnings only in the long term, but they could also have a positive health effect in the shorter term. While the education-health gradient is well established in the literature, there has been considerable debate about the interpretation of this nexus (see Cutler and Lleras-Muney, 2012, for a survey of this literature).

Studies relying on natural experiments to identify causal effects of education on health find mixed results. Recently, Meghir et al. (2011) found only a little temporary impact of education on health for Sweden, while Clark and Royer (2013) found no effect at all in the United Kingdom. On the other hand, Brunello et al. (2016) find a small positive effect for a selected number of EU countries. As there is too much uncertainty about the health benefits of higher educational attainment, these effects should not be included in the SCBA.

Valuing the health benefits resulting from employment is challenging. First, the effects are likely to vary across countries (Avendano and Berkman, 2014). Second, health differentials between groups are typically measured in Quality-Adjusted Life Years (QALY) weights, an index scale ranging from 0 to 1, where 1 refers to perfect health and 0 to near death.⁸ Empirical studies that analyze the effects of unemployment on health typically do not use outcomes that are easily amenable to QALY weights. This means that it is necessary to rely on a regression approach to evaluate the health benefits from the YG, estimating the effect of moving out of unemployment or inactivity on measures of QALY weights, and controlling for a set of individual characteristics.

⁸ The QALY weight is a measure of current health and denotes the value associated with it. For instance, a value of 0.8 means that the present year of life is estimated to be worth 0.8 year of life in perfect health.

QALY weights can be derived from ordered probit regressions on self-perceived health variables (Cutler and Richardson, 1997; Groot and Massen van der Brink, 2007) derived from EU-level data. Self-perceived health can be related to either employment or education through ordered probit, controlling for relevant individual characteristics. QALY weights for being employed or having a given educational attainment (vis-à-vis the previous NEET state) are easily obtained from the estimated coefficients. All the data required for this exercise are available from the EU-SILC. The individual benefits of the YG on health can be obtained by the following formula:

$$V(QALY)_i \times \Delta QALY_i = V(QALY)_i \times \beta_1 N_{empl}$$

where $V(QALY)_i$ is the monetary value of $QALY_i$, N_{empl} is the number of YG participants employed (weighed by the average annual duration of a given spell in employment); β_1 is the effect on QALY weights of being employed or having a given educational attainment.⁹

The EuroVaQ project launched by the European Commission developed methods to determine the monetary value of QALYs across a number of EU countries. The resulting values are very high compared to values routinely used in the United Kingdom, where the National Institute for Care Excellence values QALYs in the range of £20-30,000, and in the United States (Weinstein, 2008, provides a figure of \$50,000). Therefore, these values should be used with some caution.

The present value lifetime health effects of the YG can be derived as the product of the long-term impact of the YG on employment rates, the effects on QALY weights of being employed, and the monetary value of QALY weights, assuming a given trend in economic growth and an appropriate discount rate. In England, for example, the *Youth Contract* was estimated to provide a lifetime discounted benefit from additional QALYs of £41.9 million (Nafilyan and Speckesser, 2014).

The YG could also be expected to generate health benefits for participants' spouses (Hurd et al., 2014). There are questions, however, about the magnitude of these spillover effects. The same applies to the effects of higher education attainment of participants on their children (Oreopoulos et al., 2006). The YG could also be expected to reduce healthcare costs, which would provide aggregate cost savings. However, there is little literature about these effects, and appropriate data are not readily available. As the quantification of these effects does not rest on secure foundations, they should be omitted from the SCBA.

2.4. Anti-social behaviour

Anti-social behaviour makes up a large share of the social costs of poverty (Bramley et al., 2016). Whilst there is no consistent study on the impact of youth unemployment on anti-social behaviour at EU level, the effect of unemployment and low income on crime is well documented in the literature (Lin, 2008, for the United States; Fougère et al., 2009, for France; Grönqvist, 2011, for Sweden; Bell et al., 2015, for the United Kingdom and the United States). The YG, by reducing youth unemployment and inactivity, is likely to reduce anti-social behaviour and crime. Benefits arising through a reduction in anti-social behaviour are likely to affect society as a whole.

⁹ This formula can be amended to allow for the eventual effects of continued education on health. See for instance the treatment of anti-social behaviour in the following Section.

For the purposes of conducting a SCBA, the number of crimes would be a more appropriate measure of outcome than the individual probability of committing a crime (the main outcome considered in the literature). Fallesen et al. (2014) estimate the effect of ALMP on the number of convictions using a natural experiment in Denmark. Introducing mandatory ALMPs reduces the number of convictions of unemployed young men who did not receive unemployment benefits by a significant amount (reaching up to almost 50 per cent, depending on the specification used). On the other hand, ALMP has no effects on the behaviour of young men who receive unemployment benefits.

There is strong evidence that more education can reduce crime (Lochner and Moretti, 2004; Lochner, 2004; Machin et al., 2011; Fella and Gallipoli, 2014). Yet benefits arising from reduction in anti-social behaviour are rarely included in SCBAs. There are various limitations that would make it challenging to use the estimates available in the literature (such as those of Fallesen et al., 2014) to predict the crime-reducing effect of the YG. First, this research has problems of external validity as it was based on a reform in a Danish municipality. Second, only a rather small proportion of crimes end up with a conviction.

A simpler approach would use macro level data, relating changes in the labour market to the number of crimes committed by 18-24 year old who are NEETs. This figure, however, is unlikely to be consistently available across EU countries. One could use the results from a representative study to run some simulations. Possible benchmark studies include Fougère et al. (2009), who analyzed the causal effect of youth unemployment on crime using French data ('*département*' level) and Machin et al. (2011) who analyzed the impact of education on crime in England and Wales. The findings of these researches could be used also for other EU countries, because the share of unemployed young people in their datasets varied substantially across regions and over time, increasing external validity. There is also convincing evidence (Lochner, 2004) that changes in socio-economic status is associated with a fall in property crimes, but it has very little effect on other types of crime. Fougère et al. (2009) analyzed the causal effect of youth unemployment on crime using an instrumental variable approach to address the reverse causation from crime to unemployment (e. g. if firms move away from areas with high crime rates). They instrument the local share of young people who are unemployed by the predicted employment growth based on the industry structure. This study does not analyze the effect of inactivity on crime. In addition, the crime reducing effect of education is typically found for men, but not women. Machin et al. (2011) identify the causal impact of gaining a qualification (compared to having no qualification) on the conviction rate using the 1972 increase of compulsory schooling age from 15 to 16 years of age in England and Wales.

The expected short-term (annual) benefits arising from a reduction in anti-social behaviour brought about by an increase in employment can be computed as:

$$V(ASB)_p \times \Delta ASB_p = V(ASB)_p \times (\varepsilon_1 N_{empl} + \varepsilon_2 N_{educ}) \times ASB_{p,t-1}$$

where $V(ASB)_p$ is the average social cost of property crime, ΔASB_i is the expected short-term change in property crime, N_{empl} is the number of YG participants engaged in employment (weighed by the average annual duration of a given spell in employment), N_{educ} is the number of young people who gained a qualification because of the YG (and would not have had any qualification in the absence of the programme), ε_1 is the elasticity of property crime to youth unemployment, ε_2 is the elasticity of property crime to lack of qualified young people, and $ASB_{p,t-1}$ is the previous-year number of property crimes.¹⁰

¹⁰ These benefits should only be calculated for participants with no qualification prior to the YG, and having no qualification is defined as having no upper secondary qualification.

In the United Kingdom, there are estimates for the average social cost of different types of crimes (Home Office, 2005). If these estimates are not available for EU Member States, the values from the UK could be used.¹¹

These long-term effects of the YG are also expected to impact anti-social behaviour and crime. The present value lifetime crime-reduction effects of the YG can be derived as the product over time of the long-term impact of the YG on employment rates, the elasticity of property crime to youth unemployment, and the average social cost of property crime, assuming a given trend in economic growth and an appropriate discount rate. In this case, however, the time though which these benefits accrue is not likely to last from the YG intervention to retirement age. According to Fougère et al. (2009) adult unemployment has no effect on property crime. Also Lochner (2004) had found that property crime rates reach a peak during the late teenage years, and then decline. Hence, benefits are supposed to accrue only until YG participants reach the age of 25 years.

The present value lifetime crime-reduction effects of the YG through continued education can be derived following the procedure outlined above. On data from England, Nafilyan and Speckesser (2014) found a discounted benefit from crime prevention (over ten years) of £66,5 million for the *Youth Contract*.

2.5. Social inclusion and the social capital nexus

So far this literature review has examined elements of economic and social wellbeing that are rather customary in social cost-benefit analyses of employment policies. However, the YG has the specific objective to foster young people's social inclusion. This requires exploring the relevance of the YG in increasing "social capital", defined as "networks, together with shared norms, values and understandings which facilitate cooperation within or among groups" (OECD, 2001).

A fundamental aspect of social capital is its people-centred perspective. Social capital is all about relationships, co-operations, links and networks. High levels of generalized trust and adherence to pro-social norms reduce transactions costs for all community members and can provide social spin-offs in the forms of reduced welfare dependence and higher taxation receipts (Productivity Commission, 2003). Social capital can also facilitate policy effectiveness by reducing transaction costs, helping the dissemination of knowledge and innovation, and promoting cooperative and/or socially minded behaviour.

Government intervention in social capital accumulation can be justified on the grounds of positive externalities and policy complementarities (Productivity Commission, 2003). A variety of policy options exists to generate or sustain social capital (National Economic and Social Forum, 2003; Productivity Commission, 2003). They include a wide range of activities, various policy fields and reflect different definitions of social capital and accumulation processes (Frank, 2003).

Participation in education and employment can strengthen social capital in a number of ways. Those who participate in education create social networks and practice participation and reciprocity

¹¹ These figures could be weighted by the ratio of a country's GDP per capita to the United Kingdom's GDP per capita. Also note that the crime taxonomy adopted in the UK may differ slightly from that of Fougère et al. (2009), requiring some adaptations.

skills that are associated with social capital. Employment provides a 'bonding' network and a much broader set of acquaintances able to provide information and contacts with other people. However, the very nature of social capital makes it virtually impossible to impute the benefits of the YG to different actors, since the benefits to programme participants and other actors (including the government) reinforce each other.

The notion of inclusive growth has acquired considerable importance in recent times (OECD, 2016; WEF, 2017). This notion provides a clear-cut approach to the assessment of the empirical relationship between the YG and social exclusion. The empirical analysis of Anand et al. (2013) describes inclusive growth as raising the pace of growth and enlarging the size of the economy by providing a level-playing field for investment and increasing productive employment opportunities. They propose a measure of inclusive growth that is in line with the definition of pro-poor growth, i.e. growth is considered to be pro-poor as long as poor people benefit in absolute terms, as reflected in some agreed measures of poverty (Ravallion and Chen, 2003).¹² This macro measure of inclusiveness is based on the micro concept of a generalized concentration curve (Ali and Son, 2007). The population is arranged in the ascending order of their income (social mobility curve). A higher curve implies greater social mobility. The EU-SILC data allow the construction of this curve. There may be degrees of inclusive growth depending on how much the curve moves up (growth) and how the distribution of income changes (equity). This feature of the social mobility curve is the basis of the proposed measure of inclusive growth.

The tax-benefit micro-simulation model EUROMOD could be useful in this regard. The at-risk-of-poverty rate (AROP) is one of the three indicators used for monitoring progress towards the Europe 2020 targets on poverty and social exclusion reduction. The timeliness of this indicator is key for monitoring the social situation and the effectiveness of tax and benefit policies. However, partly due to the complexity of EU-SILC data collection, estimates of the number of people at risk of poverty are published with a significant delay. Gasior and Rastrigina (2017) extend previous work on 'nowcasting' indicators of poverty risk using the EUROMOD model enhanced with additional adjustments to capture changes in the employment characteristics of the population since data were collected. Under some assumptions about the nexus between utility and income (see e.g. Layard et al., 2008), this kind of move toward greater social inclusion can also be valued in monetary terms.

Whereas the concept of social capital can help in shedding light on the nexus between the YG and social inclusion, the ambiguity and uncertainty surrounding this concept suggests that its measurement should be done along various dimensions. A key element of this multidimensional approach is that social capital considerations should be incorporated into other policy assessments. Government policies can also have negative effects for social capital. Policies that are not designed through a 'social capital lens' may harm or deteriorate social capital. Questions related to the social capital content of a policy can be included in the questionnaires that are routinely administered for the monitoring of YG interventions. Cox and Caldwell (2000) suggest a list of questions to investigate the social capital content of policies. The equality, poverty and rural proofing approach used in Ireland contain elements that are relevant for an evaluation of the impact of policies on social capital (NESF, 2003).

¹² Growth is pro-poor if the incomes of poor people grow faster than those of the population as a whole; that is, if inequality declines (Dollar and Kraay, 2002). By focusing on inequality, the relative definition could lead to suboptimal outcomes for both poor and non-poor households. For example, a society attempting to achieve pro-poor growth would favour an outcome characterized by average income growth of two per cent, where the income of poor households grew by three per cent over an outcome where average growth was six per cent, but the incomes of poor households grew by only for percent.

In order to value social capital, a link is required between well-being and income (the happiness literature contains suggestions on this link, see Layard, 2006). Failing this quantitative link, the deterioration or improvement of social capital can only be used as a lexicographic criterion: programmes, areas and countries where benefits are greater than costs and social capital improves (or does not deteriorate) should be ranked higher than those in which benefits are greater than costs, but social capital deteriorates.

There is a widespread use in the literature of proxies of social capital, such as density of voluntary organisations and electoral participation (Putnam (2000), electoral participation (Guiso et al. 2004) and newspaper reading (Schmitt-Beck, 2008). These measures can be derived from national statistical sources and from the European Social Survey (ESS). All these indicators could be linked to the YG policy interventions by adopting a regression format similar to that adopted by Fougère et al. (2009) for the relationships between unemployment and crime. This, however, does not solve the issue of assigning a monetary value to social capital. For these reasons, these benefits should be excluded from the SCBA.

2.6. Gender segregation

European young men and women in vocational schools and general secondary education still opt for career choices reflecting traditional gender roles. Better vocational guidance is needed to address this issue and for career advisers to be more gender aware and thus more able to challenge the stereotypes that exists in school cultures and among students and employers. Gender-sensitive guidance, which is currently only available in half of EU countries, is more often targeted at girls than boys and it usually aims at encouraging girls to choose technology and natural science careers. Although interesting projects exist, overall national strategies to combat gender stereotypes in career choices and initiatives aimed at boys are lacking (Eurydice, 2010). A reduction of gender segregation in occupations would not simply benefit individual (female) participants by increasing their income. It would also lessen their social exclusion by reducing their distance from job-related social and community networks, which result from discrimination.

The classic measurement approach to gender horizontal segregation in employment relies on Duncan's D, an index of dissimilarity between two distributions (Duncan and Duncan, 1955). More recently other indexes have been proposed (Karmel and MacLachlan, 1988; Hakim, 1993; more details can be found in Bettio and Verashchagina, 2009). These indexes could be easily calculated from the EU-LFS data. Since the YG is a large scale policy intervention, it is reasonable to assume that it affects the evolution of gender horizontal segregation. This effect, however, could take time (four to five years) to work itself into employment data. In this sense, it would be better to compute Duncan's D for the horizontal gender segregation in education, relying on enrolment data from the OECD education database. A reduction in gender horizontal segregation can provide an extra boost to female labour income – beside the improvement in individual human capital – by alleviating the so-called crowding effect (see Cotter et al., 1997; Cohen and Bianchi, 1999).

2.7. Indirect benefits of employment income

The individual earnings of employed YG participants are likely to underestimate the overall impact of the YG on the economy if a *Keynesian multiplier* effect exists. Initial government spending to finance the implementation of the YG interventions can stimulate additional spending in the economy. As a result, gross domestic product (GDP) increases by more than the initial YG spending. This effect is higher if the young NEETs who gain a new income have a higher propensity to consume than other income recipients. There is a considerable body of research (Miyazawa, 1976; Madden and Batey, 1983; Batey and Madden, 1999) on “extended” input-output models that link economic and demographic models and estimate distributional multipliers with multiple categories of consumption spending and income recipients.¹³ A typical distributional multiplier involves a distinction among intensive and extensive components (linked to current and new residents in a policy-interested area) as well as a redistributive component (linked to the portion of new income going to previously non-employed residents). The distinction between currently employed and currently non-employed workers is crucial, as the redistribution of income from the average taxpayer to lower income persons (YG participants and other previous non-employed) typically increases the marginal propensity to consume of the economy.

The measurement of the multiplier effect could rely on the European Regional Database and the Dynamic Social Accounting Matrix (DySAM) approach adopted by the International Labour Office (ILO) to analyze employment impacts in the last decade (Alarcon et al., 2011). More sophisticated macro-econometric models, such as *Hermin* or *Quest*, allow going beyond the hypothesis of fixed wages and prices, but lose something in terms of the richness of distributional specifications. These latter models are already being used in the evaluation of the impact of the EU structural funds. Distributional and supply-side considerations may be included by combining macro-econometric and micro-simulation models (more information about these models is provided in Annex 1).

A recent review of fiscal multipliers finds these are significantly higher during economic downturns compared to normal economic circumstances or periods of significant growth (1.9 and 1.5, respectively, see Gechert et al., 2015). Extended models that link population and economic models with input-output multipliers with multiple categories of consumption spending and income recipients should produce higher multiplier values, since they make allowance for the higher propensity to consume of young workers.

2.8. Returns to firms

Given the existence of monopoly power in the economy, some workers getting jobs as a result of the YG generate monopoly rents that accrue to the owners of the firms for whom they work. The value of their marginal product exceeds their marginal revenue product and their wage rate. Thus, focusing on only labour earnings may underestimate the overall economic benefits of the YG. A method to assess the magnitude of these additional benefits is to use a Product Market Corrector (Fujiwara, 2010).

¹³ These models are referred to as demo-economic or eco-demographic. The demo-economic definition relates to inputs from various labour (household) groups, while the eco-demographic definition reflects the different consumption patterns by various household types.

This corrector can be obtained by using the complement to the labour share of income from national accounting (GDP) data, namely:

$$\Pi = W \times \text{PMC}$$

where Π are profits and W are the earnings of participants). A PMC based on the reciprocal of labour share of income (traditionally put at 0.7) should be approximately equal to 1.43. This means that for each euro of new labour earnings in the economy, a total of 43 cents is returned to other factors of production. This approach, however, may overestimate benefits since a share of income accrues to foreign owners of companies (to be excluded from a SCBA). In addition, the complement to the labour share of income cannot be solely ascribed to monopoly power in the economy. There is no reason to think that all, or even most, of these returns result from monopoly rents. This suggests that the PMC should only be used in the sensitivity analysis.

2.9. Returns to government

The benefits accruing to governments include increased income tax and social insurance contribution revenues and lower social security outlays. The time profile of these effects proceeds from the estimates of Card et al. (2015) with a reversed sign. These benefits are relatively straightforward to capture, as household-based surveys typically contain information about gross earnings. However, these benefits are in reality a transfer to and from government and do not represent a net effect of the YG. As such, they should be excluded from the SCBA.

2.10. Efficiency of the public sector

The YG's call for greater flexibility in policy management, enhanced local governance arrangements and partnership approaches may have a direct impact on the effectiveness of employment policies (Giguère and Froy, 2009; Froy and Giguère, 2010). An example of this is the establishment of one-stop shops to ease the delivery of more seamless services to unemployed persons (e.g. benefits payments, access to active labour market policy, support with transport and childcare).

Partnership-based local strategies may also have a favourable impact on the efficiency of educational or training institutions. This means that the implementation of the YG may promote both social capital accumulation and policy effectiveness. The measurement of the degree to which policy design conforms (and eventually adjusts) to the flexibility and integration advocated by the OECD Local Economic and Employment Development (LEED) approach can be done through a survey (similar to the one suggested for measuring social capital). It can also be measured directly by screening the characteristics of policy management (Giguère and Froy, 2009; Froy and Giguère, 2010). These characteristics can be linked to quantitative efficiency in the provision of Public Employment Services (PES) and other services to estimate the benefits linked to better public governance (Cavin and Stafford, 1985 and Sheldon, 2003). Estimates of the cost savings for PES, higher educational institutions, or other public institutions can be constructed through econometric or linear programming techniques well established in the literature.

The valuation of the influence of YG on public policy governance and public sector efficiency could also help with social capital estimates. If the output of PES, higher educational institutions or other public institutions also extends to social capital (quantified through questionnaires or other means), a linear programming analysis of the production process of these institutions could provide monetary shadow values for social capital. This kind of exercise has already been carried out to value a clean environment (Kuosmanen and Kortelainen, 2007). This approach, however, is much more tentative than the measurement of cost savings linked to better public policy governance.

3. Social costs

The delivery of YG measures entails direct programme costs borne by the taxpayer, opportunity costs for programme participants (travel, care, leisure) and other social costs like substitution effects and the deadweight loss of taxation. For these costs, this paper relies mostly on the literature about youth employment interventions. Young people who enter employment or education have less time for non-market activities and leisure. The quantification of these opportunity costs have been very rarely attempted (Greenberg and Robins, 2008) and are expected to be very low for young NEETs. In addition, employment and education may also have a positive utility (Jahoda, 1982), which balance the loss in non-market time. For these reasons, these costs should be ignored in the SCBA

3.1. Programme costs

The costs of delivering YG measures are shouldered by public institutions and include the costs for introducing subsidised employment, start-up incentives, continued education and labour market training programmes, as well as the costs of structural reforms or building the capacity of PES.

After three years of implementation of the YG, the countries of the EU have collected enough data and information to determine, with some degree of certainty, the costs of the measures that are included in their YG plans. These data can be used as a proxy to calculate the average costs that are required for replicating, expanding or adjusting existing measures and estimate the costs of introducing new measures.

A method to estimate the direct programme costs of YG interventions is available from the International Labour Office (ILO, 2015). The main steps consist of the: (i) determination of the number of participants/beneficiaries; (ii) average costs of the measures; (iii) average duration of the programme; and (iv) identification of the costs for the administration of the measures and services. The latter is usually defined in the range of 10 to 20 per cent of programme costs.¹⁴ The cost estimates for the different types of YG interventions can be calculated according to the following formulas:

- (1) Average cost of wage subsidy = [(n. of participants x subsidy amount x average duration) + 10-20%]
- (2) Average cost of training programmes = [n. of participants x (average level of compensation x average duration) + (training cost per person x average duration)] + 10-20%
- (3) Average costs of apprenticeship = [n. of participants x (average gross apprenticeship wage x average duration) + (classroom-based training costs x average duration)] + 10-20%
- (4) Average cost of traineeship = (n. of participants x average allowance x average duration) + 10-20%

Following a procedure akin to that suggested by the ILO (2015), Nafilyan and Speckesser (2014) estimate the direct costs of the *Youth Contract* as equal to £8,7 million.

¹⁴ These costs include the expenses that the PES sustain for screening eligible individuals and partner enterprises; matching individuals with partner enterprises; monitoring of programme performance; and reporting.

3.2. Opportunity costs: travel and care costs

Young people who enter employment or education as a result of the YG may experience additional costs, such as travel to and from work or college, childcare costs for lone parents or families with another earner, and care costs of elderly members of the family.

An empirical approach to the measurement of these costs was developed by the United Kingdom Department for Work and Pensions (Fujiwara, 2010). This approach calculates transport costs as the product of annual average commuting cost by the additional number of years in employment or training generated by the YG. The first step of this approach is the estimation of the number of days spent travelling. Ideally, this number should derive from data about the mode of transport used for commuting by YG participants. If these are not available, the commuting patterns of young people could be used as a suitable proxy. Information on the number of days spent travelling is then combined with data on average commuting length and costs for each mode of transport. This generates an estimate of annual commuting costs. Finally, these estimates are multiplied by the duration of YG interventions to derive the value of travel costs imputable to the YG. If the data required are not available, the estimates used in United Kingdom can be applied (Fujiwara, 2010) or, alternatively the analysis can dismiss these costs as they are likely to be rather small.

Young people who have children or care for elderly parents or relatives and have no access to free care services may have to sustain additional costs once they take an offer of employment, continued education, apprenticeship or traineeship. The estimates of additional care costs require to account for the proportion of young NEETs who have children or care for the elderly (EU-SILC or EU-LFS); the median hours of care per week needed (EU-SILC); and average costs (from national data sources of EU statistics).¹⁵ The resulting figure should be multiplied by the additional number of years in employment or education/training. The overall result is the additional care cost resulting from the participation in the YG. If national data for these estimates are not available, the ranges used by the United Kingdom Department for Work and Pensions can be applied (Fujiwara, 2010).

3.3. Opportunity costs of education

The opportunity cost of education refers to the fact that those young people who receive an offer of continued education and training could have found a paid job in the absence of the offer. Opportunity costs are likely to be relatively low for young people who are NEET and likely to vary on the basis of initial labour market status (unemployed or inactive). Different cost measures should be elaborated separately for the two groups, using the information available in EU-SILC.

In order to measure these opportunity costs, it is necessary to estimate the average duration of the unemployment or inactivity spell (ideally disaggregated by level of educational attainment) and the proportion of unemployed and inactive young people engaged in continued education which would have found a job in the absence of the YG. This, multiplied by the average earnings of young people employed (also disaggregated by level of educational attainment), gives a measure of opportunity costs. If these figures are not available from administrative data, they can be retrieved from earning econometric estimates (to control for earners' observable characteristics) using EU-SILC data.

¹⁵ These costs can be extracted from figure D6 at page 86 of European Commission/EACEA/Eurydice/Eurostat: *Key Data on Early Childhood Education and Care in Europe* (Luxembourg 2014).

3.4. Indirect costs: substitution effects

The YG could crowd out employment and training opportunities for other persons not involved in the YG measures.¹⁶ Specifically, there may be supply- and demand-side substitution effects and equilibrium wage effects.

By increasing their job search intensity or their labour market skills, YG participants may end up in jobs that would otherwise have been gained by non-participants (Johnson, 1972; Schiller, 1973). If workers who are substituted by YG participants become unemployed or accept lower wage jobs, the benefits of the YG on society will diminish (supply-side substitution effects). The size of this effect largely depends on the state of the labour market. If labour markets are tight, substitution effects will be low; otherwise substitution costs could be substantial. Substitution effects are likely to be greater during an economic downturn, and to diminish as the economy recovers. Public employment and wage subsidy programmes may have substitution effects similar to those highlighted above. Targeted workers may be hired instead of non-targeted workers who become a more expensive option for employers (demand-side substitution effects). The YG may potentially have an impact on labour supply putting downward pressure on competitive equilibrium wages. In a competitive labour market, this could either increase labour demand and thus employment or depress labour supply and thus employment.

There is evidence that ALMPs may indeed bring about substitution effects (Skedinger, 1995). These effects have been estimated using three approaches: (i) surveys in which employers are asked whether the work performed by programme participants would have been performed in the absence of the programme; (ii) macro-econometric studies that estimate the relationship between employment and various measures of programme size; and (iii) general equilibrium modelling. This evidence is summarized in Greenberg et al. (2011) who point out that each of these methods is subject to important shortcomings. Recently, a randomized controlled trial in France showed that ALMPs may have large substitution effects: untreated unemployed people are much less likely to find a job in labour markets where a high proportion of unemployed persons have entered a programme (Crépon et al., 2013). These researches also provide insights as to the differences in magnitude and persistence of substitution effects.

There is a great deal of variation in the estimates of substitution effects, due to different time periods, geographic locations and type of methodology and data sources. Demand-side programmes (e.g. employment subsidies) tend to result in large substitution effects; Greenberg et al. (2011) suggest that these programmes should be subject to sensitivity tests in which an effect of 45 per cent should be assumed. For supply-side programmes (e.g. training or programmes, sanctioning), a substitution effect of 20 per cent should be used. These figures should be seen as an upper limit (pessimistic scenario).

Evidence on equilibrium wage effects is more mixed and many studies do not find statistically significant results. Greenberg et al. (2011) suggest that no effect on equilibrium wages should be assumed in sensitivity analysis. However, this conclusion could be challenged on the ground that the YG is expected to provide a large share of young NEET with quality offers, with the level of earnings being one of the most important dimension of job quality.

The labour-market outcomes of young people aged 25-29 and 30-34 years should be monitored closely to assess whether the YG crowds out jobs for these age groups. The easiest way to do this

¹⁶ The terms of substitution and displacement effects are used in the literature, sometimes interchangeably, and sometimes meaning (slightly) different concepts. Here reference is made only to substitution effects.

would be to subtract the number of ‘displaced’ individuals from the estimate of the number of additional young people who gain a job as a result of the YG. This exercise could be based on a combination of micro-simulations (mainly relying on the EUROMOD model) and on difference-in-differences econometric estimates, based on the EU-LFS, pitting young YG participants against the closer age groups (25-29 or 30-34 year olds).

3.5. Indirect costs: deadweight loss of taxation

The increase in taxation needed to fund the YG could distort individual behaviour and reduce economic surplus, creating what is usually referred to as the deadweight loss of taxation. Standard microeconomic theory suggests that taxation usually reduces economic efficiency in a competitive market without imperfections. Including the deadweight loss of taxation would provide a more accurate assessment of costs (Greenberg and Knight, 2007). The deadweight loss of taxation is routinely included in the cost-benefit analysis of public policies implemented in Australia, New Zealand and the United Kingdom. The main assumption behind the idea that taxation results into distortionary effects is the efficiency-maximizing nature of equilibrium. The high level of youth unemployment and inactivity provides *prima facie* evidence of a non-market clearing (suboptimal) equilibrium. The rationale for including the deadweight loss of taxation in a social cost-benefit analysis of the YG is, therefore, rather weak. Based on a survey of the relevant literature, Fujiwara (2010) suggests including a value of 20 per cent in the sensitivity analysis only.

Even under the hypothesis of efficiency-maximising market equilibrium, the calculation of the size of the deadweight loss of taxation is not straightforward. The deadweight loss can be approximated by the following formula (Feldstein, 1999), under the assumption that labour demand is perfectly elastic:

$$\text{deadweight loss} = \frac{1}{2} (\text{tax rate})^2 \times (\varepsilon) \times (\text{tax base})$$

where ε is the labour supply elasticity with respect to tax. Many empirical analyses of labour supply elasticity relate to specific countries and rely on data and specifications of difficult comparison. Bargain et al. (2014) analyze labour supply elasticity for eighteen EU countries, using the EUROMOD model and data from national household surveys (table 2). The results show that cross-country differences in labour supply elasticity are not too large in the aggregate. If it is assumed that tax rates do not vary much across countries, the 20 per cent value taken by Fujiwara (2010) for the (percentage) deadweight loss is within the ballpark of the labour supply elasticity estimated by Bargain et al. (2014). However, the elasticity for married men is quite different from those of all other categories. This means that consideration should be given not only to gender, but also to marital status composition for estimating these costs.

Table 2: Estimates of labour supply elasticity in the European Union and United States

	<i>Married Women</i>	<i>Married Men</i>	<i>Single Women</i>	<i>Single Men</i>
<i>Austria</i>	0.34	0.07	0.14	0.14
<i>Belgium</i>	0.30	0.13	0.44	0.27
<i>Denmark</i>	0.30	0.15	0.13	0.26
<i>Estonia</i>	0.08	0.08	0.12	0.17
<i>Finland</i>	0.13	0.10	0.21	0.33
<i>France *</i>	0.18	0.08	0.15	0.14
<i>Germany *</i>	0.31	0.14	0.22	0.17
<i>Greece</i>	0.62	0.11	0.41	0.19
<i>Hungary</i>	0.15	0.08	0.08	0.16
<i>Ireland *</i>	0.40	0.21	0.38	0.50
<i>Italy</i>	0.33	0.04	0.67	0.22
<i>Netherlands</i>	0.32	0.06	0.16	0.08
<i>Poland</i>	0.10	0.04	0.09	0.09
<i>Portugal</i>	0.14	0.04	0.08	0.03
<i>Spain *</i>	0.57	0.11	0.17	0.49
<i>Sweden *</i>	0.14	0.09	0.24	0.27
<i>U.K. *</i>	0.11	0.05	0.36	0.28
<i>Mean</i>	0.26	0.09	0.24	0.22
<i>S.D.</i>	0.16	0.04	0.16	0.13
<i>U.S.</i>	0.14	0.08	0.23	0.20

Source: Calculations based on Bargain et al. (2014). For countries indicated by a *, Bargain et al. compute the elasticity for two years, and the mean value is reported in the table.

4. Discount rates and distributional weights

This Section discusses the discount rates and distributional weights to be applied to a social cost-benefit analysis of the YG.

The criterion for appraising the value of a policy intervention is the ratio of benefits over costs (B/C). If this ratio is equal to one, the policy is marginal as it is just covering its costs. If the ratio is higher than one, it is beneficial. The B/C ratio adopted for evaluating social costs and benefits does not take into account the time horizon of the policy. Future benefits and costs cannot be treated at par with present benefits and costs. All the costs of the YG relate to the present time, while some of the benefits will be enjoyed in the future. A social discount rate has to be used to measure the present value of these long-term benefits, so that all benefits can be meaningfully poised against costs. If a high discount rate is chosen, the future benefits will be discounted more heavily.

The European Commission *Guide to cost-benefit analysis of investment projects* (EC, 2014) suggests the adoption of a social discount rate of four per cent.¹⁷ This rate is in real terms and applies to financial flows expressed in constant prices. Different values may be used in the sensitivity analysis. The customary approach to SCBA assumes that the resources for the YG are obtained through taxation. If deficit financing is used, the rate of interest at which funds are borrowed may be used as discount rate.

The impact of the YG will be experienced differently across different groups. Participants to the YG are young people who are currently NEET; the intervention costs mostly weigh on taxpayers, which have on average higher incomes. According to the traditional utilitarian assumption of diminishing marginal returns to income, the increase in utility brought about by additional income for YG participants is greater than the reduction in utility for taxpayers bearing up the YG costs. The overall social welfare impact of the YG, therefore, should allow for varying distributional weights attached to the incomes gained and lost through the YG.¹⁸ These distributional weights should be consistent with the hypothesis that the marginal utility of income is higher for YG participants than for the taxpayers. The United Kingdom's *Green book for appraisal and evaluation* (2013) and the *EC Guide* (European Commission, 2014) suggest the following formula:

$$WW = \left(\frac{y_p}{y_b} \right)^\eta$$

where y_p is the median income of taxpayers, y_b the median income of the YG participants and η is the elasticity of the marginal utility of income. The *Green book* recommends using a value of η equal to 1, while the *EU Guide* does not recommend any specific value. Layard et al. (2008) find that the relationship between income and utility is more concave than implied by a value of η equal to one. Relying on a number of empirical analyses, this research surmises a value of 1.26. Fujiwara (2010) argues that this value should be used for the derivation of distributional weights.

¹⁷ See http://ec.europa.eu/smart-regulation/guidelines/tool_54_en.htm

¹⁸ In SCBA distributional weights are parameters multiplying costs and benefits with factors that are inversely proportional to the well-being levels of the interested parties.

Annex 1: Estimation and computation – some issues

Following deVet et al. (2010), it is useful to divide the models available for the assessment of economic and social outcomes into models concerned with: (i) the effects of policy interventions on economic and social outcomes at aggregate or regional level (“aggregate or regional effects”); and (ii) the effects of policy interventions on the employment, income and access to services of different social groups (“redistributive effects”). Several models are available for the quantitative assessment of aggregate or regional effects.

- **Macro-accounting models** (e.g. input-output, social accounting matrices) rely on relatively weak theoretical foundations and behavioural mechanisms are not incorporated. Prices are fixed. The multipliers calculated with Leontief models tend to be larger than those calculated with input-output models.
- **Macro-econometric models** have the advantage of having all key markets and outcome variables covered for a whole territory. They can also be easily combined with input-output and inter-regional interdependencies. However, they are demand-oriented and tend to overestimate impacts, as they do not make allowance for supply-side feedback. Macro-econometric models are more suitable for evaluating the short- to medium-term impacts of investments and subsidies. QUEST is the macro-econometric model used by the EU Directorate General on Economic and Financial Affairs (ECFIN). It is a structural macro-model in the New-Keynesian tradition with rigorous microeconomic foundations derived from utility and profit optimisation and including frictions in goods, labour and financial markets. Larger multi-country calibrated versions of this model address issues for which a deeper level of disaggregation is required, both at the regional and sector level. Promising macro-econometric models have been established for Ireland (HERMES,) and the Netherlands (REMI-NEI). These models can be applied to regulatory policies (such as EU directives), but usually require analytical and empirical add-ups to analyze cost or price determination. The HERMES model has already been adapted and applied across several EU countries in the form of the simpler HERMIN model. The most important constraint to extend these models across the whole EU relates to differences in the characteristics and functioning of economies. The applicability of these macro-econometric models is especially good in areas such as budgetary policies (investments, taxation and subsidies) and there is some potential for regulatory policies.
- **Computable General Equilibrium (CGE) models** have a stronger micro-economic foundation, including supply side and price adjustments. CGE models are likely the best tools for analysing the long-term impacts of macroeconomic and regulatory policies. However, most CGE models need further development to deal properly with cost or price determination. CGE models are also readily adaptable to the study of regional economic policies. Several noteworthy CGE models have been developed within the EU, notably for Finland (VERM and REGFIN), the Netherlands (RAEM) and Poland (MAMor2). These models are applicable to the EU level to varying degrees. Adapting the VERM model to cover all EU countries at a regional level is unlikely to be possible, as it would need extensive analytical and data development. The RAEM model is more easily applicable and it is currently being developed at the EU level on behalf of the Directorate General for Regional and Urban Policies. Macro-econometric models have a rich structure, but also rely on many (often untested) hypotheses concerning model specification (variables inclusion, values of key parameters, dynamic structure and functional form). The application of CGE models across the EU requires striking a balance between the need for simplicity and the properly modelling of relevant variables (costs, prices, taxes, budgetary flows). CGE models are especially useful for estimating the impacts on production, employment and income at national or regional levels. They can also simulate

redistributive effects between industrial sectors or regions, but are less suitable for the estimation of other kinds of redistributive effects, because they generally incorporate only one type of representative households.

- **Micro-simulation models** are used to determine the impact of policy changes at the micro level (individuals, households, firms). They are powerful tools for appraising the impact of social and economic policy changes in detail, yet they are simply accounting mechanisms and are not dynamic. They are primarily used to investigate the first-round impact of government policy reform. Within the family of micro-simulation models, EUROMOD is used across the whole EU. It calculates the effects of changes in tax and benefit policies on household disposable incomes, income inequality, work incentives and the public budget. Using standardised coding across EU countries, EUROMOD accounts for the interactions between various components of the tax and benefit systems. The lowest level of aggregation of outputs is the individual level. EUROMOD is a static model that generally does not attempt to capture individual behavioural responses to changes in policy. The model is based on theoretical considerations, but is independent of any single theoretical perspective. This is to ensure that it will be useful for the evaluation of a wide range of policy proposals, in many contexts and over a long period of time. However, the model also has the potential to be used as a platform for particular analyses of behavioural change. For labour supply, a dynamic approach using panel data has considerable potential. Although there are no extant works applying EUROMOD to the analysis of ALMPs, these policies (including the YG) could undoubtedly be included in a micro-simulation exercise. A few studies (see for instance Fernandez Salgado et al., 2014) have been carried out matching EUROMOD with LFS data to take into account institutional changes in the labour market. This approach could also be followed for the simulation of YG employment policies. The effects of training programmes are perhaps more difficult to estimate because they imply longer-term effects. The main limitation of EUROMOD is the very labour-intensive maintenance required to keep it up to date.
- **Model family analysis** is a method closely related to static micro-simulation. Rather than using data for a whole population, data for a set of pre-defined hypothetical “model” households are used as input. Model family analysis is a simple, and therefore widely applicable, tool for measuring redistributive effects at the level of households. The typical applications are in the area of pensions and social protection. Model family analysis can be applied quickly, and become an integral part of policy preparation. Its main limitations are the focus on 'typical' households and the fact that it is most appropriate for expenditure-based interventions and income effects.

Policy-makers are interested in dynamic behaviour. Micro-simulation models that allow for the evaluation of long-term effects currently do not exist. The measurement of regional and redistributive impacts of various policies (including the YG), which also take into account both supply and demand sides, can be done by combining macro-econometric (CGE) and micro-simulation models (e.g. EUROMOD).

There are currently important limitations as regards the capacity of methods and models to assess aggregate or redistributive impacts at the EU level in a comprehensive manner (de Vet et al., 2010). These limitations relate to data requirements (especially for regional-level outcomes), the differences in the functioning of national and regional economies, labour markets and institutional contexts, and the different ways in which modelling expertise is organised in different countries.

Table A1: Micro and macro models: Main features

	<i>Time dimension</i>	<i>Behavioural adjustment</i>	<i>Stochastic /deterministic</i>	<i>Outcome variables</i>	<i>Data</i>	<i>Budget</i>	<i>Time</i>	<i>Applicability at EU level</i>
Micro Models								
Model Family Analysis (static)	No	No	Deterministic	Income	▪ Typical households	Medium	Medium	Medium
Static micro-simulation models	No	No	Deterministic	Income	▪ Administrative survey	High	Long	High
Dynamic micro-simulation models	Yes	No/Yes	Stochastic	Employment Income	▪ Administrative survey	High	Long	Low
Micro-simulation models and CGE models (static or dynamic)	Yes	Yes	Deterministic	Employment Income	▪ Administrative survey	High	Long	Medium
Macro Models								
SAM	Annual or longer	No	Deterministic	Employment Income Production	▪ National or regional accounts ▪ Input output table	Medium	Several weeks	High (DySAM is already available)
Macro-econometric models (dynamic)	Annual	Yes	Stochastic	Employment Income Production	▪ Time series ▪ national or regional accounts ▪ Input output table	Medium to high	Several weeks	High (HERMIN model already rolled out in EU)
CGE models (static or dynamic)	Annual or longer	Yes	Deterministic	Employment Income Production	▪ Time series ▪ national or regional accounts ▪ SAM matrix	Medium to high	Several weeks	High (RAEM model under construction for EU)

Source: Vet et al. (2010)

Annex 2: Some examples of sensitivity analysis

A sensitivity analysis consists of a set of techniques aiming to test the robustness of the results of a model or system in the presence of uncertainty. It appraises the change in the output of a mathematical model or system (numerical or otherwise) in response to a change in its more uncertain inputs. In the context of a social cost-benefit analysis, it is used to check what the outcome would be if different assumptions are made about some key parameters.

Some examples of sensitivity analysis applied to some elements detailed in Sections 2 and 3 of this review are provided below.

”Scarring” effects

Prolonged periods of unemployment may signal low productivity to potential employers (Scarpetta et al., 2010). This is problematic for young people, as unemployment early in a career is more likely to result in a reduced skill-set (both cognitive and non-cognitive) and/or a loss in confidence that could adversely affect young people ability to obtain a job (Burgess et al., 2003). Since scarring effects can be accounted for only through a particular model of the economy, they are considered only in the sensitivity analysis.

Two alternative methods were suggested in the main text: (i) estimates from Mroz and Savage (2006) to value the scarring effect on employment and wages through a simulation exercise, or (ii) adaptation of the same methodology to EU level data (EU-LFS and EU-SILC). Another alternative is to use the methodology used by Gregg and Tominey (2004), which focus on individuals with different educational attainment levels. The more sophisticated procedure suggested in Cockx and Picchio (2013) appears too demanding in terms of informational content. Compared to other studies, the estimates from Mroz and Savage (2006) appear relatively low. However, it is better to underestimate the benefits from scarring avoidance, as these effects cumulate over many years

Output multiplier

The multiplier effect for public investment ranges from 1.5 to 1.9 (Gechert et al., 2015). A sensitivity analysis of this element should take into account other values, for example that of the multiplier for public transfers (ranging from 0.7 to 1.9). Extended models with multiple categories of consumption spending and income recipients should produce higher values, as they make fuller allowance for the higher propensity to consume of young workers. Gibson and Flaherty (2016) quote two values that can be useful, 2.5 for simpler input-output based model and 2.1 for CGE models.

Returns to firms

If monopoly power exists in the economy, workers would generate monopoly rents that accrue to firms’ owners because the value of their marginal product exceeds their wage rate. A product market corrector (PMC) based on the reciprocal of labour share of income would equal 1.43. A share of the benefits, however, accrues to foreign employers and should not be accounted in the SCBA. In addition, the reciprocal of the labour share of income cannot be solely ascribed to monopoly power in the economy. A sensitivity analysis on this item could use the analysis of Tronti (2007), in order to single out monopoly rents within non-labour incomes (based on national accounts data). For example, in the period 1980-2006 the monopoly rents in Italy fluctuated between two and 12 per cent of GDP. This gives PMC values of 1.02 and 1.14, respectively. These values seem more reasonable than the 1.43 value provided by the literature.

Substitution effects

There is a great degree of uncertainty regarding the size of the substitution effect. The literature indicates that demand-side programmes should be subject to sensitivity tests where the substitution effect is assumed at 45 per cent, whilst supply-side programmes should use a substitution effect of 20 per cent. No effect should be assumed for equilibrium wages (Greenberg et al., 2011). Since, however, the YG is expected to provide a large share of young people with “quality” offers (and the level of earnings is a key indicator of job quality), a tentative effect of 10 per cent may be considered for the sensitivity analysis.

Deadweight loss of taxation

In order to account for the deadweight loss of taxation, Fujiwara (2010) suggests using the averages of the low and high estimates provided by the literature (17-27 per cent). These figures are in line with those suggested by the United Kingdom Department for Work and Pensions (25 per cent) and the guidelines for conducting cost-benefit analysis in Australia and New Zealand. The estimates based on United States research of compensated elasticities (40 per cent) appear rather high (Greenberg and Knight, 2007). All these estimates assume that the resources for the YG are obtained through taxation. If policy interventions are funded through deficit financing instead, the rate of interest at which funds are borrowed may be used.

Annex 3: Summary of costs and benefits, estimation methods and data sources

BENEFITS		
Item	Method	Data sources
Employment income	Labour income = number of young beneficiaries employed [net impact of the YG])* job duration * average gross earnings.	EU-SILC
Avoidance of “scarring”	The scarring effect is retrieved from the literature or from direct econometric estimates. This effect is projected into a stream of future earnings making customary assumptions about income growth and discount rate.	EU-SILC, EU-LFS
Returns to education	The effect of education is derived from Mincerian econometric estimates. This effect is projected into a stream of future earnings making customary assumptions about income growth and discount rate	EU-SILC
Employment security	Comparison of contract duration and access to labour protection entitlements vis-à-vis the relevant labour regulations	Administrative data
Health	QALY weights are derived from health-related data. The effect of moving out of unemployment or inactivity on QALY weights is estimated econometrically, controlling for a set of individual characteristics.	EU-SILC and national health questionnaires
Anti-social behaviour	Macro-econometric estimates of the relationship between unemployment, inactivity, income, and anti-social behaviour, or calibration based on the parameters of France and United Kingdom	European Regional Database
Social inclusion	Analysis of inclusive growth. Micro- and macro-econometric estimates of the relationship between unemployment, inactivity, income, and various measures of social capital or public policy governance.	EU-SILC; data on social capital from questionnaires and proxies (European Social Survey)
Gender segregation	Computation of measures of horizontal gender segregation on employment and education enrolment data.	EU-LFS, OECD education database.
Output multiplier	DySAM (for Keynesian and distributional effects). More articulated macro-econometric models, like HERMIN or QUEST, eventually integrated with micro-simulation models	European Regional Database
Returns to firms	Computation of a Product Market Corrector (Fujiwara, 2010)	National accounts data
Public sector efficiency	Estimates of efficiency for PES, higher educational institutions, other public institutions may be constructed with econometric techniques, and associated to changes in public policy governance (Giguère and Froy, 2009; Froy and Giguère, 2010).	Data on flexibility and integration of local policy management; data on costs and outputs for public institutions
COSTS		
Programme costs	ILO methodology (2015)	EU-LFS and administrative data
Opportunity costs: travel and care	Estimates based on Fujiwara (2010)	EU-LFS, national LFS
Opportunity costs of education	Probability to find a job in the absence of the YG offer * average gross earnings.	EU-SILC
Substitution effects	Difference-in-Differences econometric estimates, Micro-simulation models (EUROMOD)	EU-LFS, EU-SILC; EUROMOD;
Deadweight loss of taxation	Computations based on Fujiwara (2010)	EUROMOD, national household surveys, EU-SILC

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