The Economics Interface

Valuing the social costs of job losses in applications for authorisation

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Objective of this note

This note provides advice on how impacts on worker (un-)employment potentially associated with the authorisation or non-authorisation of the use of Annex XIV substances in the EU might be quantified and valued from a *societal* perspective.[1] The note is intended for those undertaking socio-economic analyses (SEAs) as part of an application for authorisation (AfA). It should be seen as supplementary to existing ECHA guidance on AfAs and SEA.

As with the existing ECHA guidance documents, the advice presented in this note should not be seen as definitive, and a number of areas of uncertainty remain regarding questions of methodology and evidence. Nevertheless, it is hoped that the advice will assist in encouraging consistency of approach on particular key issues, as well as indicating the possible views of the Committee on Socio-economic Analysis (SEAC) in developing its opinions. However, as with AfAs generally, it is ultimately for applicants to decide which methodologies they consider most appropriate in order to make their case.

Changes in employment possibly associated with decisions on authorisation of the use of Annex XIV substances in the EU

Three sources of changes in employment might be proposed to be associated with changes in the use of Annex XIV substances which might follow an authorisation decision (positive or negative):

1. Job losses as a result of the closure of manufacturing plants and job gains associated with the establishment of new plants;
2. Job losses/gains due to changes in costs and market share of the applicant;
3. Job losses/gains due to possible impacts on competitors.

Many AfAs submitted so far specify a non-use scenario which involves the closure of an industrial plant in the EU, often accompanied by the establishment of a new plant (or expansion of an existing plant) outside of the EU. The costs of these job losses are generally included in the SEAs which are undertaken as part of the AfA, although it is less common for the benefits arising from newly created jobs to be considered. The changes in employment at these plants can be seen as a direct result of the authorisation decision and hence it is

[1] The societal perspective implies that regulation-induced losses to one actor may be offset by gains to another actor. Purely distributional impacts of a regulatory decisions such as unemployment benefits paid by the government or termination pay by companies should not be included in the overall impact assessment and are not covered in this note.

appropriate that they are included within the scope of a SEA. These types of job changes form the focus of this note.[2]

Other non-use scenarios (and, indeed, applied-for-use scenarios) involve switches to alternative production technologies which do not require the use of the Annex XIV substance in question, but which would result in additional costs for the firm(s) involved. Changes in employment could be associated with such scenarios, for instance because the new technology does not require as much labour (a direct employment effect), or because the firm's increased costs make it less competitive and its output and sales – and hence demand for labour – fall (an indirect employment effect). Thus far it does not appear that any AfAs involving non-use and applied-for-use scenarios like this have actually specified these types of employment impacts. However, they are in principle valid potential effects of authorisation decisions, and as such for quantification in SEAs.

Similarly, employment impacts on the firm's downstream customers and upstream suppliers are validly seen as the result of the authorisation decision and hence included within the scope of the SEA's benefits-risks comparison. The difficulty here is likely to be in providing an accurate and convincing estimate of the size and nature of these impacts. Where customers and suppliers are effectively dependent on the authorisation firm for their continued business, it might be possible to identify credible knock-on employment effects. Where a firm's business represents only a contribution to its upstream and downstream output, estimating the marginal impact on employment of losing that business will not be easy. The same is likely to be true for local economy impacts, even where a firm represents a sizeable local employer.

The final type of employment impact which is sometimes proposed relates to changes in employment in firms and sectors which are competitors to the applicant. For example, if the non-use scenario of a firm involves the closure of its operations, with associated job losses, it is sometimes argued that the market share which the firm used to enjoy will be taken up by competitor firms (generally using substitutes for the Annex XIV substance): the competitors will then expand their output and, with it, their employment of workers. However, even though such an adjustment process could occur, it will generally not be appropriate to identify (and quantify) employment impacts such as these as part of the comparison of the benefits and risks of continued use of an Annex XIV substance. This is because the methodology for estimating the societal costs (and benefits) of changes in employment already takes account of these types of adjustments by treating all employment reductions as temporary – that is, job losses in the 'authorisation' firms are balanced by job increases in other firms, albeit after some delay which reflects the time taken for markets and firms to react to changes in demand. This issue is discussed further below.

Methodological approach to valuing the impacts of changes in employment

Haveman and Weimer (2015) set out the basic approach to the valuation of the impacts of changes in employment in socio-economic analysis, and this is the general approach adopted here. They identify a number of different 'components' of the overall societal impact of a

[2] The note focuses only on the appropriate approaches to value employment impacts of these types of non-use scenarios in monetary terms, and takes the reality of such claimed job losses (and gains) as given.

change in employment, which are described briefly below. Initial attention is given to employment reductions (i.e. job losses), and differences in the valuation of employment increases (i.e. job gains) are then highlighted.

Haveman and Weimer (2015) consider the valuation of the impacts of employment changes under three situations they describe as follows:

1. Full employment;
2. Unemployment with perfect liquidity;
3. Unemployment with imperfect liquidity.

The 'full employment' scenario is actually more correctly called a 'perfectly competitive labour market' scenario, since it assumes not only that there is full employment, but that there is perfect and immediate switching between jobs. In other words, there is no frictional unemployment. It is possible that, in certain limited cases, this situation might be approximated to – for instance, where workers have very in-demand skills, and are given adequate warning of job losses, so that they can have a new opening ready for them the moment their existing position disappears. However, in the majority of situations, workers can expect a period of unemployment between jobs. Even if competitor firms are located close to the firm which is closing, so that they can easily take on those skilled workers who might enable them to respond to the altered market environment by increasing their output, this is still likely to happen with some delay, since competitors will generally wish to wait until they have real evidence that their business is likely to expand. They might also need to increase their output capacity, and the recruitment and training process itself takes time. Hence, some variant of Haveman and Weimer's (2015) unemployment scenarios is more likely to apply.

The distinction between the perfect and imperfect liquidity scenarios is largely a technical one relating to how values might be practically measured.[3] In practice, the question is not whether individuals face imperfect liquidity, but how imperfect their liquidity is. Moreover, the valuation of impacts in the current exercise is entirely dependent on existing evidence and values which have been estimated in the literature, under whichever scenario held and/or assumptions were made at the time. Therefore, it is presumed that the imperfect liquidity situation holds, and any possible deviations from this will be highlighted if they occur.

Under the 'unemployment with imperfect liquidity' scenario, the impacts associated with the loss of employment can be summarised as follows (adapted from Haveman and Weimer (2015), Table 1):

[3] For instance, one of the impacts of a change in employment is upon the amount of spare (leisure) time an individual has. The value which individuals place on this time depends on their budget constraint, and this in turn will depend on whether they are employed or unemployed at the time of valuation, and whether, when unemployed, they are effectively able to borrow against future employment income. If they are able to borrow perfectly against future income (the perfect liquidity case), individuals' budget constraints are effectively 'smoothed' over periods of unemployment, and expressed values of spare time will not vary with this factor (but might vary for other reasons, such as the amount of spare time individuals have when they are in work or out of work).

1. The value of output/wages lost during the period of unemployment;
2. The cost of searching for a new job, and hiring and firing employees;
3. The impact of being made unemployed on future earnings and employment possibilities (the 'scarring' effect);[4]
4. The value of leisure time during the period of unemployment;
5. The costs of health and other wellbeing effects of being unemployed on the unemployed individual;
6. The costs of health and other wellbeing effects of the individual being unemployed on others (e.g. the individual's children);
7. External costs of unemployment (e.g. health treatment costs paid for by taxpayers).

Unsurprisingly, the value of impacts associated with the creation of a new job is an approximate mirror image of the above list. For instance, instead of job search costs for the individuals who are unemployed, there are hiring costs for the firms that employ them.[5] Instead of an increase in costs to health and wellbeing from being made unemployed, the creation of a job reduces these costs. It can also reduce the 'scarring effect' by representing an improvement in lifetime employment prospects for the individual. The issue with the job creation scenario is that it is difficult to estimate the effect of a job on the length of the individual's current unemployment spell, since it is unlikely that it will be known for how long the individual has already been unemployed, if, indeed, they have at all. In that respect, it is important that jobs that are being created (or destroyed) are genuinely new (or lost) jobs which would not have existed (or would have continued to exist) in the absence of whichever Annex XIV authorisation scenario is under consideration. The issue of the measurement of the length of unemployment spells is considered further below.

Advice on how some of these impacts might be valued for use in SEA in AfAs is provided in the rest of this paper. The focus is on the first four components in the above list. Although there is a growing literature on the health and wellbeing impacts of unemployment, the evidence is still novel and rather uncertain, and constructing values for such possible impacts would involve several strong assumptions.[6] The literature and data on unemployment and wages is well established and widely available, however, and dates back decades even for relatively less-researched issues like 'scarring'. It is expected that the other components of cost will be included as and when the evidence about their existence and significance improves. Applicants should consider whether it would be useful to include these impacts in their SEAs when compiling them.

[4] Haveman and Weimer (2015) actually define the 'scarring 'effect as 'the change in human capital [which] can be monetized as the difference between earnings with continued employment and earnings if released.' In other words, they combine into a single measure the direct loss of output associated with the period of unemployment following job loss (the first item in this list) and the impact on future employment opportunities and earnings (the third item). However, they are separate out in this note to increase clarity, and reflecting how the monetisation of these impacts is likely to be made in practice (see below).

[5] As it happens, the approach proposed in this paper includes the costs of recruitment into the next job as part of the costs of a job loss. The rationale for this is explained below.

[6] Haveman and Weimer (2015) do attempt to construct values for health and wellbeing impacts of unemployment, and in so doing demonstrate the large evidence gaps which need to be assumption-filled to make the exercise possible. Moreover, recent evidence from German panel data that allow controlling for endogeneity issues suggests that the relationship between mental and physical health and unemployment is not so clear (Schiele and Schmitz 2016).

Cost components and discussion

For each of the cost components valued in this section, the approach adopted by Haveman and Weimer (2015) is first described. That study was undertaken in a US context, which is reflected in the data and evidence used to construct values. For the current exercise, attempts have been made to find literature and data specific to the EU and its Member States, but this search cannot be exhaustive. Applicants undertaking their own calculations for the purposes of completing a SEA are advised to check for more specific data and evidence relating to the scenarios relevant to their application. It is highly probable in any case that applicants will have proprietary data for some types of impact – for instance, wage data of staff potentially affected by employment changes – which is more accurate and more applicable than data available from reference sources such as Eurostat or national statistical agencies.

Wage rates and labour costs

The central, 'base' component of the social cost of unemployment is the loss of valuable output which the individual would have produced had he not been made unemployed. This can be calculated as the product of some measure of labour output and the expected duration of unemployment (see next section). Haveman and Weimer (2015) use pre-tax worker compensation as their measure of the social value of labour output. Note that taxes here include those paid both by workers (e.g. income taxes) and employers (e.g. social insurance), since these are transfers from the productive sector to the government sector which is paid for out of total labour output.

In general, firms compiling AfAs can be expected to have good data on the earnings of employees affected by direct changes in employment (through existing wage data or wage rates for new positions). They should also have ready access to tax information which will permit the calculation of employee and employer tax payments.

Where information is likely to be lacking is on labour output (earnings) in firms within the same supply chain which would be directly affected by the authorisation decision. For instance, a manufacturer of an Annex XIV substance might wish to apply for authorisation for its downstream customers' use of the substance, and these customers report that a requirement to stop using the substance after its sunset date would oblige them to close their operations. It might be unlikely in such a situation that those downstream users would be willing to provide information on their wage costs, and the applicant might need to estimate them or find some other way of presenting them in the AfA.

Duration of unemployment

The duration of unemployment is the second input into the calculation of the social costs of direct employment changes associated with authorisation decisions. To estimate the appropriate duration during periods of high unemployment, Haveman and Weimer (2015) use the approximate mean of the peak unemployment durations following two previous US recessions (1982 and 2009) when unemployment reached 10 per cent: 20.8 weeks and 40.7 weeks, to give an indicative figure of 30 weeks.

Haveman and Weimer's (2015) implication is that, at unemployment rates below this (by some unspecified amount), the US economy is at full employment, in which case certain

components of social cost of unemployment will not be generated. (See their Table 1.) However, as already discussed, their distinction between 'unemployment' and 'full employment' seems unreasonably strict. The characterisation in Haveman and Weimer's (2015) Table 1 implies that individuals who are made unemployed at times of full employment immediately walk straight into new jobs with no actual period of unemployment at all, despite having to incur costs of searching for a new position (C_s in Haveman and Weimer's (2015) Table 1). Although not impossible for individuals with unique and highly valuable skills who receive warning of impending job loss, as a general rule this seems unnecessarily unrealistic.[7]

It would seem more reasonable to tailor, to the specifics of the authorisation case in question, the assumptions about the likely duration of unemployment spells encountered by individuals who are made unemployed as a result of the authorisation decision. For workers with highly in-demand skills who are given notice of future job loss, an assumption of a relatively short unemployment duration seems appropriate, whereas workers with more general skillsets might be assumed to face unemployment spells more reflective of the average labour market conditions prevailing at the time. When compiling their dossiers, therefore, applicants for authorisation should consider the circumstances of affected workers, local economic conditions, and the availability of data and evidence relating to employment conditions in affected markets.

In many cases, information about local circumstances will not be available, and applicants will need to rely on regional and national sources of data. Tatsiramos (2009) analysed data from the European Community Household Panel, in which individuals from a number of Member States reported the duration of their unemployment spells. He reported mean durations of between six and 18 months, depending on country and whether individuals were benefits claimants or not (see Table 1). However, these data are incomplete in terms of country coverage, and now rather out-of-date.

Table 1: Mean duration of unemployment (months), 1994-2001

	Benefits claimants	Non-claimants
Denmark	11.42	6.06
France	15.35	8.91
Germany	18.16	7.6
Greece	7.95	8.69
Ireland	12.08	7.16
Italy	8.16	12.01
Spain	11.3	7.82
UK	13.89	10.09

Source: Tatsiramos (2009)

A number of international organisations publish data on the duration of unemployment in their member countries, including the OECD, the World Bank and Eurostat. Different

[7] Contemporary models of the labour market involve some positive level of unemployment due to 'friction' – the period of time for which people must search for jobs due to imperfect matching of labour supply and labour demand. In practice, the distinction between unemployment due to friction and unemployment due to a lack of jobs is blurred, since unemployed workers need to search for jobs in both cases (Michaillat, 2012).

measures relating to duration are published, which reflects the different ways in which individual countries collect and report unemployment data. For instance, the OECD publishes, for each member country, annual breakdowns of the unemployed population by duration grouping (less than one month, between one and three months, etc.), but publishes average durations of unemployment for only a limited subset of those countries.[8] Average durations can be estimated from proportions by making assumptions about the mean duration within each grouping, but with such a wide grouping as 'longer than 12 months', as reported by the OECD, the potential bias is rather large. For instance, if the midpoint is assumed for all 'limited' groupings, and a mean 18 months is assumed for the 'unlimited' 'longer than 12 months' grouping, then estimated mean duration for 2014 is 10.84 months for the Czech Republic, compared with a mean duration reported by the OECD of 17.8 months (see Table 2). Equivalent figures for Finland are 7.45 and 10.7 months. Given the relatively narrow ranges in the limited groupings, it is reasonable to assume that most of this error is generated by the assumptions about mean duration for those who are unemployed the longest. But the durations for this group which would be required to make the estimated and reported means equal in Table 2 are 33.5 months for the Czech Republic and 31 months for Finland, and it would be difficult to arrive at these assumed durations without first knowing the mean durations for the populations as a whole.

Table 2: Estimated and reported mean unemployment duration (months), 2014, OECD

Country	Duration grouping	Proportion	Assumed duration	Estimated mean	Reported mean
Czech Republic	< 1 month	7.3	0.5	10.84	17.8
	> 1 month and < 3 months	12.8	2		
	> 3 months and < 6 months	15.4	4.5		
	> 6 months and < 1 year	19.4	9		
	1 year and over	45	18		
Finland	< 1 month	10.9	0.5	7.45	10.7
	> 1 month and < 3 months	28.2	2		
	> 3 months and < 6 months	20.2	4.5		
	> 6 months and < 1 year	15.6	9		
	1 year and over	25.1	18		

Source: OECD http://stats.oecd.org/Index.aspx?DataSetCode=AVD_DUR

Eurostat publishes even more detailed data than the OECD on the duration of unemployment in EU Member State, although the data are not complete for every state. As an illustration, the equivalent data to those reported in Table 2 is shown in Table 3, for men and women aged 20-64. It can be seen that a more detailed breakdown of duration groupings is provided in the Eurostat data. If the midpoint is taken as the mean duration for that grouping, and 48 months is taken as the duration of the 'longer than 48 months' grouping, the calculated mean durations for the unemployed population as a whole are 16.1 months for the Czech Republic and 9.5 months for Finland. Leaving the midpoints unchanged, the average maximum durations which would set the calculated total mean durations equal to the means reported by the OECD (and given in Table 2) would be 65 months for the Czech Republic and 71 months for Finland. The '48 month' assumption is clearly unrealistic, as this grouping covers those who are unemployed for *at least* 48 months. However, as before, without knowledge of the

[8] http://stats.oecd.org/Index.aspx?DataSetCode=AVD_DUR

actual (reported) total mean durations, it is not possible to know what should be assumed about the maximum mean duration in order to generate an accurate estimate of the total mean. Nevertheless, having a more detailed breakdown of groupings results in an estimated value which is close to the reported mean than the estimate based on the more limited OECD set of groupings, at least for these two countries.

Table 3: Estimated mean unemployment duration (months), 2014, Eurostat

Country	Duration grouping	Proportion	Assumed duration
Czech Republic	< 1 month	7.1	0.5
	> 1 month and < 2 months	13.8	1.5
	> 2 months and < 6 months	15.2	4.5
	> 6 months and < 12 months	19.2	8.5
	> 12 months and < 18 months	12.0	14.5
	> 18 months and < 24 months	7.0	20.5
	> 24 months and < 48 months	15.3	35.5
	48 months and over	10.4	48
	Calculated mean		*16.1*
Finland	< 1 month	15.1	0.5
	> 1 month and < 2 months	24.1	1.5
	> 2 months and < 6 months	19.3	4.5
	> 6 months and < 12 months	15.1	8.5
	> 12 months and < 18 months	8.3	14.5
	> 18 months and < 24 months	5.3	20.5
	> 24 months and < 48 months	6.3	35.5
	48 months and over	5.2	48
	Calculated mean		*9.5*

Source: Eurostat http://appsso.eurostat.ec.europa.eu/nui/show.do?wai=true&dataset=lfsq_ugad

In some situations it might be the case that the only unemployment duration statistic which is available is the proportion of the unemployed who have been out of work for less (and more) than 12 months. For instance, this is the way long-term unemployment is reported in the World Bank's World Development Indicators.[9] If the proportion out of work for less than 12 months is interpreted as an estimate of the probability that a worker will get a job within 12 months, and this probability is assumed to be constant, then an estimate of the average duration of unemployment can be calculated as per Table 4.

Table 4 uses the Eurostat data in Table 3 to provide a figure for the proportion of the unemployed population which is out of work for less than 12 months – 55.25 per cent in the Czech Republic and 73.58 per cent in Finland. It then takes these figures as the constant annual probability of finding work, and calculates the proportions of individuals finding work in each year following a displacement. Thus, for Finland, 73.58 per cent are assumed to find work in the first year, meaning that 26.42 per cent are unemployed for longer than this. Of these, 73.58 per cent are assumed to find work in the second year – or 19.44 per cent of the total unemployed population (26.42 × 73.58) – and the remainder (6.98 per cent of the total) are unemployed for longer than this. The calculations continue until the proportions in future years become suitably small (which happens more quickly the higher is the assumed annual

[9] http://wdi.worldbank.org/table/2.5

probability of finding work). If it is then assumed that the individuals finding work in each year have been unemployed on average until the middle of that year (e.g. those finding work in the first year have a mean duration of unemployment of six months), then the overall mean duration can be calculated. This comes out as 10.31 months for Finland and 15.54 months for the Czech Republic, which is again relatively close to the estimates in Table 2.

Table 4: Mean duration of unemployment based on proportion out of work for less than 12 months

Country	Year	Proportion finding work in year	Proportion still unemployed	Weighted average years	Weighted average months
Czech	1	55.25%	44.75%	0.28	3.32
Republic	2	24.72%	20.02%	0.37	4.45
	3	11.06%	8.96%	0.28	3.32
	4	4.95%	4.01%	0.17	2.08
	5	2.22%	1.79%	0.10	1.20
	6	0.99%	0.80%	0.05	0.65
	7	0.44%	0.36%	0.03	0.35
	8	0.20%	0.16%	0.01	0.18
	Total	99.84%		1.29	15.54
Finland	1	73.58%	26.42%	0.37	4.41
	2	19.44%	6.98%	0.29	3.50
	3	5.14%	1.84%	0.13	1.54
	4	1.36%	0.49%	0.05	0.57
	5	0.36%	0.13%	0.02	0.19
	6	0.09%	0.03%	0.01	0.06
	7	0.03%	0.01%	0.00	0.02
	8	0.01%	0.00%	0.00	0.01
	Total	100.00%		0.86	10.31

Source: Eurostat (2016), see explanations in the text.

Applicants should consider which approach is most appropriate in their case, which will depend on the likely unemployment outcomes of the workers affected by the authorisation scenarios in question (which in turn reflects their individual characteristics like skills, age etc., as well as local and macro-economic conditions), and the data at their disposal. In most cases, the data used in Tables 2-4, and similar unemployment data, are collected by statistical agencies in the countries themselves, and applicants should check directly whether the agencies relevant to their own cases and countries hold additional or more detailed data than those reported internationally.

‘*Scarring*’ *effects*

Scarring effects relate to the impact which has been observed of being made unemployed on an individual’s subsequent labour market outcomes. In the US, evidence suggests that most of this scarring effect occurs through wages being lower in jobs following a period of unemployment than they were in the job from which the individual was made unemployed, whereas the evidence in Europe suggests the effect works more through the subsequent probability of being made unemployed and the duration of subsequent unemployment (although the balance seems to vary across countries, see, e.g., Upward and Wright (2015)). Scarring is seen to be the result of a range of factors. For instance, it could reflect the de-skilling which might accompany a period of inactivity, or the opportunity costs of not

acquiring job experience, or the fact that the previous position more effectively 'matched' the skills of the individual with the requirements of the job and employer. This latter reason in particular is seen to explain why scarring effects tend to be bigger for involuntary rather than voluntary redundancy (see below): if an individual leaves a job voluntarily, it is more likely to be because he has found a position which matches his skills as well or even better than his current job.

Haveman and Weimer (2015) provide a brief review of some of the US literature and then construct an estimate of the costs of scarring in the following way.[10] First, as mentioned above, they assume an unemployment duration of 30 weeks based on median experience of the 1982 and 2009 recessions. They assume that wages fall by three per cent as a result of scarring, based on a US Bureau of Labour Statistics (2012) report on the wages paid to re-employed, long-tenured displaced workers between 2009 and 2011. This estimate is therefore based on the experience of all unemployed workers, including those who leave work voluntarily, whereas evidence suggests those who are made involuntarily unemployed experience greater negative impacts on wages and re-employment (see, e.g., Ball (2011)). Haveman and Weimer (2015) assume that this reduction in wages will be experienced for six years (based on the findings of Jacobson, LaLonde and Sullivan (1993), Schoeni and Dardia (1997), and Kletzer and Fairlee (2003)), but that, otherwise, individuals will be fully employed over this period. An annual real rate of growth of wages of 0.9 per cent and a discount rate of three per cent are further assumed. Taken together, these assumptions mean that an unemployment event is associated with a loss of human capital of approximately 20 per cent – that is, the discounted value of wages in the years following an unemployment event is 80 per cent of the value of wages over the same period if that unemployment event had not occurred.[11] According to Haveman and Weimer, this translates (via a 'rule of thumb') into a total wage loss equal to 95 per cent of annual pre-unemployment wages. This figure can be compared against the results of two US studies, which estimated that scarring results in losses equivalent to 1.4 years' worth of pre-unemployment earnings (Davis and von Wachter, 2011) and 2.8 years' worth of pre-unemployment earnings if unemployment is above eight per cent (von Wachter, Song and Manchester (2009).

A brief review of the relevant recent European literature has been undertaken and the results are summarised in Table 5. (Other studies exist, but these are a little dated to be helpful in generating estimates of scarring costs for practical use in REACH socio-economic analysis.) The studies report their results in terms of the 'penalty' paid on new employment compared (usually) with the previous job. Some studies cover only those who are re-employed in the period under consideration, whereas other studies cover all those made unemployed, whether subsequently re-employed in the period or not. Obviously, studies which include those still unemployed find a bigger scarring effect than those which exclude them.[12]

[10] Haveman and Weimer (2015) do not provide the workings behind their estimates so this explanation is based on our own attempt to replicate their results based on the explanation provided in the paper.

[11] As already mentioned, this estimate includes both the loss of wages as a result of the initial period of unemployment and the reduction in wages in jobs when the individual is re-employed.

[12] The distinction is important since it affects the practical methodology which would be used to calculate scarring costs – if estimates of scarring are taken from studies which exclude those who remained unemployed during the study period, then the costs of the initial employment spell itself would need to be estimated separately (as was done by Haveman and Weimer (2015)). The costs of this initial spell are implicitly included in the estimates from studies which also cover those who remain unemployed over the study period.

Table 5: Summary of recent European studies on wage scarring

Author	Country	Time period	Results	Comments
Ball (2011)	GB	91-01	12.5% penalty after four years' tenure	Penalty for those joining from unemployment rather than a previous job
				All types of unemployment, not just involuntary
			7% penalty	Penalty on wage in next job for those made redundant
				Effect declines with more unemployment spells
			8.3% penalty	Following unemployment in tight labour market
			13.4% penalty	Following unemployment in slack labour market
			17.5% penalty	Over 45s, following unemployment in tight labour market
			0.5% penalty	Under 45s, following unemployment in slack labour market
			0.7% gain in first year, 2.3% second, 3% after four years	Under 45s, high unemployment areas
			9.4% penalty in first year, 12.4% second, 13.1% after four years	Over 45s, high unemployment areas
			3.2% gain in first year, 1.5% second, 2.3% after four years	Under 45s, low unemployment areas
			8% penalty in first year, 12.7% second, 13.5% after four years	Over 45s, low unemployment areas
Hijzen (2010)	UK	94-03	10-30% penalty per year over five years	First year losses greatest, much lower in fifth year
				Results significantly affected by workers who leave labour force following closure
Leombruni (2013)	Italy	97-03	12-29% penalty per year over six years following closure	
Balestra (2012)	Switzerland	96-09	10.4% penalty in year of separation, 12%, 13.2%, 11.4%, 11.3% in following years	All individuals, involuntary separation, fixed effects
			9.3% penalty in year of separation, 10.6%, 10.4%, 8.5%, 9.9% in following years	Full-time workers (before and after) only, fixed effects
			41.3% penalty in year of separation, 20.9%, 18.5%, 16.7%, 19% in following years	All individuals, involuntary separation, including zeros
			42.7% penalty in year of separation, 22.5%, 19.9%, 17.8%, 20.6% in following years	Full-time workers (before and after) only, including zeros
Edler (2015)	Germany	93-10	4.4% penalty (unemployment up to 1 year), 9.8% penalty (unemployment over 1 year)	New hires, excludes those still unemployed
Ichino (2007)	Austria	78-98	20% point lower employment rate during first 5 years following displacement	
			10% point lower employment rate during second 5 years following displacement	
			5% reduction in earnings through first and second five years following displacement	
Raposo (2014)	Portugal	97-08	71.6% wage penalty in first year, 52.3% in second, 49.8% third, 55.6% fourth, 59.4% fifth, 50.8% sixth	Firm closure, including unemployed
Upward & Wright (2015)	UK	91-07	34.6% penalty in first year, 21.7% 1-3 years, 18.1% 3-5 years, 15.6% 5-7 years, 11.6% 7-10 years	Total labour income, including unemployment and self-employment

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The studies also tend to find a scarring effect which declines over time, since the earlier years include the impact of the initial unemployment spell. Studies which distinguish between those who are made unemployed and those who leave their jobs voluntarily also find that the former experience higher scarring costs than the latter – at least partly this will be down to the fact that those who leave voluntarily are more likely to be leaving to take up a job they have already secured, and hence experience no unemployment (and possibly a wage increase in their new job). Ball (2011) also finds that older workers experience higher scarring costs, but no clear pattern of effect of whether the job loss happens in higher or lower unemployment areas.

In general, Table 5 indicates that scarring costs have been found to be significant and persistent for several years. This is despite the fact that most of the studies in Table 5 covered periods of (significant) economic growth ending before the full effects of the recent economic crisis will have been felt. Raposo's (2014) study of Portugal is somewhat of an outlier, in that it found penalties of around 50 per cent, whereas figures around 10-20 per cent (more in the first year) seem more representative. These figures might actually be expected to underestimate the scarring effect in the current economic climate, at least in some Member States, but the nature of the evidence is such that it is not possible to quantify by how much. The estimates are definitely significantly larger than the value of three per cent that Haveman and Weimer (2015) assumed for their calculations.

Reservation wages and the value of leisure time

Studies of the costs of unemployment generally fail to acknowledge that spending time in work is costly for an individual. That time has value of its own which must be given up by working because that time cannot be spent on other things. The concept of the 'reservation wage' – the minimum wage an individual must be paid to persuade him to take up a specific job – captures this. The reservation wage could therefore be linked to the next best job the individual could take, or it could be the value of the individual's time out of work. Many studies have attempted to estimate the value of reservation wages, but only one study has been found for this note which has estimated the value of leisure time *per se*. The point is that, in socio-economic analysis, the value of time out of work should be deducted from any estimate of the costs of unemployment (in the case of job losses) or the benefits of employment (for job creation).

Haveman and Weimer (2015) set the reservation wage at 50 per cent of annual post-tax wages/compensation, which is consistent with a linear labour supply curve from zero to the full market wage. The difference between annual compensation and the annual value of reservation wages can then be seen as an estimate of the worker's 'producer surplus'. In relation to those seeking work, the reservation wage reflects the value of leisure time but also, clearly, the individual's expectation of what wages he might be able to command in the labour market (see, for example, Koenig *et al* (2014)). The review undertaken for this note has uncovered very few studies which have provided direct estimates of the value of reservation wages. This is because, on the one hand, the value is in large part unobservable and, on the other, the value *per se* is not of particular interest in the associated literature, which is concerned more with the relationship between the reservation wage and other variables (such as expected or actual market wages), and how they change over time (e.g. over the business cycle). From the conclusions of Manning (2011), and on the basis of the

results reported by Brown *et al* (2009), Brown and Taylor (2013) for the UK and Koenig *et al* (2014) for the UK and Germany, a fair figure would seem to be in the region of 80 per cent of the expected future wage (which in turn is a relatively good predictor of actual wages (Manning, 2011)).

This figure might on casual inspection seem high, but is generally consistent with the rather small amount of time spent on job search in unemployment (see next section). It is, however, also subject to considerable uncertainty (Manning, 2011). Note that this is 20 per cent less than the *future* wage expected post-unemployment, which is itself subject to the scarring effect already mentioned. That would mean that the reservation wage would be around 70 per cent of pre-unemployment compensation. Research has suggested that the reservation wage tends to fall as the duration of unemployment (Brown and Taylor, 2013) and the level of local unemployment (e.g. Blien *et al*, 2012; Brown and Taylor, 2015) increase.

Job search and hiring and firing costs

When an individual is made unemployed, his employer might face certain firing costs (e.g. performance reviews and other additional bureaucracy) and he is likely to incur costs of searching for a new job, and when he finds one, his new employer will need to incur costs on interviewing and training. These are all genuine social costs associated with an additional job loss, since none would have been incurred if the specific job loss in question had not happened as a result of the authorisation decision. They are, effectively, the additional costs associated with returning the individual back to the state they were in before the additional job loss occurred.

Haveman and Weimer (2015) use a study by Dolfin (2006) for their estimates of hiring costs, which in turn was based on an examination of the 1982 Employment Opportunity Pilot Project in the US. This found that 13.5 hours of employee time was spent on recruitment, and 146 hours on training of new recruits; new recruits themselves spent 201 hours on training. This gives a total number of hours equal to around 17 per cent of the first year's salary cost (assuming 2000 hours per year worked). Haveman and Weimer (2015) further assumed that around 20 per cent of workers get jobs with previous employers so incur no training costs.

Haveman and Weimer's (2015) estimates for job search costs come from a 2012 US Bureau of Labor Statistics survey, which found that two per cent of the general population undertook an average of around 16 hours of job search per week. On the basis of an eight per cent unemployment rate in 2012, Haveman and Weimer (2015) assumed that one quarter (2%/8%) of the unemployed actively seek work, giving an average per unemployed worker of four hours per week. Assuming 30 weeks' unemployment duration at 10 per cent unemployment, this gives an average of 120 hours' of search per unemployment spell.

The evidence on job search and hiring costs in Europe is similarly scarce. Manning (2011) provides a brief review and concludes that hiring costs (including initial training) of around four per cent of annual starting salary seems reasonable, although Blatter *et al* (2012) find a higher estimate of 11-17 weeks' wages (around 20-30 per cent of annual salary) for skilled workers in Switzerland in 2000 and 2004. Regarding search costs, Manning (2011) reports only two (rather dated) studies in Europe, both from the UK, which found mean search times of around six hours per week. Aguiar *et al* (2013) have completed a more recent and

comprehensive analysis of the Multinational Time-Use Survey, and report results for weekly job search time spent by unemployed people in the UK, Germany, France, Spain and Italy. They found figures of between zero and four hours per week, depending on country and the age of the individual.

Illustrative example

In this section we present a simple hypothetical example to illustrate how the various bits of evidence, data sources and components of cost could be brought together to estimate the value of the impacts of the loss of one job as a direct result of an authorisation decision. The purpose of providing this example is not to be prescriptive – alternative methodologies and assumptions might be more suitable in any real and specific situation.

Wage rates, the duration of unemployment and the value of output

We use the report compiled by Rogers and Philippe (2015) as the source of pre- and post-tax wage rates in the EU, and base our example on data for Spain. The basic measure of output which is lost following the displacement of a worker from a job is the wage gross of employer tax contributions. The wage gross of employer contributions is the appropriate measure since this approximates to the total value of output produced by the employee. The wage net of these employer contributions is paid to employees as compensation for their time and effort. The employer tax contribution is a transfer from employers to the government. Profits which an employer might make on each worker are counted separately as part of total business profits. This leaves the wage gross of employer contributions, which Rogers and Philippe (2015) report as €33,809 in Spain in 2014-15, including an implied 21 per cent employer tax contribution (giving a gross wage paid to employees of €26,027).

As discussed in relation to Table 3, Eurostat publishes data on the numbers of unemployed people in each Member State in the EU, by existing duration of unemployment spell. By making assumptions about the mean length of each duration grouping, the population mean duration can be estimated. Table 6 presents Eurostat data for Spain which are similar to those presented in Table 3.

Table 6: Estimated unemployment duration (months), Spain, 2014

Country	Duration grouping	Number	Proportion	Assumed duration	Mean duration	Median duration
Spain	< 1 month	317,425	5.9	0.5		
	> 1 month and < 2 months	715,250	13.2	1.5		
	> 2 months and < 6 months	684,975	12.6	4.0		
	> 6 months and < 12 months	803,925	14.8	8.5		
	> 12 months and < 18 months	580,050	10.7	14.5		
	> 18 months and < 24 months	476,225	8.8	20.5		
	> 24 months and < 48 months	1,097,775	20.2	35.5		
	48 months and over	754,300	13.9	48		
	Total	5,429,925			19.18	≈14

Source: Eurostat http://appsso.eurostat.ec.europa.eu/nui/show.do?wai=true&dataset=lfsq_ugad

As before, assuming mid-point means for each duration category and 48 months' duration for the longest category, the calculated mean duration for Spain in 2014 was 19.18 months. This

gives an estimate of lost output due to the initial unemployment spell of €54,042 (undiscounted), based on mean duration.

Scarring effects

Evidence suggests job loss is not just associated with the costs of output foregone during the period of unemployment following immediately afterwards, but also with reduced output for several years afterwards in the new jobs the worker finds and in terms of more frequent bouts of unemployment. The evidence discussed does not indicate a single estimate of impact. The review finds that studies often estimate a larger loss in the first years following displacement, consistent with the direct effects of the initial unemployment spell; some studies find impacts which last for considerable periods, as long as 10 years; and losses tend to be bigger for those made unemployed involuntarily.

For the purposes of this illustration, it is assumed that there is an average reduction of 20 per cent in output following reemployment, with the effect lasting six years. In this way, we are using the 'overall' results on scarring reported in the literature but calculating the costs separately based on the initial unemployment spell and the effect on wages and output in subsequent employment. This approach allows better adjustment of the calculation to reflect the likely unemployment experience of those workers actually affected by job loss as a result of authorisation decisions (e.g. shorter durations for highly skilled workers and longer durations for less skilled ones).

As with the direct loss calculation, the annual wage gross of employer contributions is the appropriate measure of output in this case. The figure reported for Spain by Rogers and Philippe (2014) is €33,809 in 2014-15. This gives a cost of scarring of €6,762 per year following re-employment, which in turn gives a figure of €40,571 (undiscounted) on the basis of a six-year total duration of effect.

Reservation wages and the value of time

Wages are (at least partly) a compensation for the time which an individual must give up to work. The value of this time is therefore judged from the perspective of the worker. The relevant trade-off for the individual is whether to have free time or whether to give up that time and receive monetary compensation. Thus, it is post-tax earnings which the individual compares against the value of his time, since this is the effective compensation he receives. The reservation wage is the point at which the individual is just indifferent between working and not working. As already discussed, estimates of the reservation wage vary, but a figure of 80 per cent of the expected post-tax wage is a reasonable summary.

The wage that the unemployed individual can expect in their next job is 20 per cent less than in the previous job, due to the effects of scarring. The average gross wage paid to employees in Spain in 2014 was €26,027 (Rogers and Philippe, 2014), implying an expected gross wage in the next job of €20,822 (80 per cent of €26,027). Rogers and Philippe (2014) report an average personal tax on wages of 21 per cent in Spain in 2014, giving an expected post-tax wage of €16,498 (79 per cent of €20,822). Finally, this implies a reservation wage of €13,199 per year (80 per cent of €16,498), equivalent to €6.35 per hour (based on a 40-hour week).

With a mean duration of unemployment of 19.2 months (1.6 years), this gives a benefit associated with the additional time the individual has at his disposal following job loss of €21,118 undiscounted.

Job search and recruitment costs

Unemployed people in the EU spend some time looking for new work. A figure of 2.5 hours per week seems a reasonable summary of what little evidence there is. For a mean duration of unemployment of 19.2 months in Spain, this gives an undiscounted cost of €1,319 (valued at the reservation wage of €6.35 per hour). These costs relate purely to time and exclude any ancillary expenses such as travel.

Recruitment costs are included here, even though they are incurred only in relation to the *next* job an individual might get after the loss of their job as a result of an authorisation decision. This is because this job loss is effectively an additional 'cycle' of unemployment which would not have occurred without the authorisation decision. Recruitment costs are part of the process of the individual 'returning' to the state he would have been in without that additional cycle; this particular cycle would not have occurred without the authorisation decision; neither would the need for re-employment and hence for recruitment costs. They are therefore reasonably treated as a welfare cost associated with that specific authorisation decision.

The literature on recruitment costs is seemingly even scarcer than that on job search. Blatter *et al* (2012) estimated costs equal to between 10-17 weeks of salary. We therefore assume a cost of 0.3 years of future (i.e. 'scarred') wages gross of employer contributions, which gives a figure of €8,114. This is broadly consistent with Blatter's (2012: p.1) contention that "empirical studies show that hiring costs are substantial, averaging between one and two quarters of wage payments" (see also Ejarque and Nilsen, 2008; Manning, 2006; Merz and Yashiv, 2007).

Total net present cost of the loss of one job

The impacts described above occur at different times over a number of years following the initial job loss in question. This is addressed by the use of discounting, which allows money quantities accruing at different points in time to be expressed in the values of a single year. The impacts considered here occur largely outside of the perspective of the applicant but are relevant to authorisation decisions from the societal point of view. A societal discount rate is therefore appropriate, and the current value of four per cent set in the SEA Guidance for Applications for Authorisation and Restrictions is applicable.

Table 7 brings together the various values estimated in the preceding sections but set within a temporal context. The period of analysis is eight years, which covers the (assumed) duration of the overall (initial unemployment and subsequent reduction in output) scarring effect of job loss. Year 1 is the 12 months following the job loss event (which might or might not correspond with the calendar year). The initial period of unemployment is assumed to last the mean duration of 19.2 months (1.6 years), after which the worker finds another job. This initial period is therefore when the direct loss of output occurs (first line in Table 7), which is offset partly by an increase in the amount of leisure time the individual has at his disposal (second line). Job search is assumed to occur throughout this unemployment period and reduces the amount of time the individual has available (third line). Recruitment and training

costs are assumed to be incurred in the first full year of employment following the end of the period of unemployment (fourth line), and are accompanied by a reduction in output as a result of scarring for an assumed six-year period (fifth line).

Table 7: Discounted net present value of the social costs of losing one job in Spain, 2014

	Present value	Nominal cost – Year 1	Nominal cost – Year 2	Nominal cost – Year 3	Nominal cost – Year 4	Nominal cost – Year 5	Nominal cost – Year 6	Nominal cost – Year 7	Nominal cost – Year 8
Lost output	€ 51,216	€ 33,809	€ 20,234	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Leisure time	-€ 19,994	-€ 13,199	-€ 7,899	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Job search	€ 1,250	€ 825	€ 494	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Recruitment	€ 7,213	€ 0	€0	€ 8,114	€ 0	€ 0	€ 0	€ 0	€ 0
Scarring	€ 33,298	€ 0	€ 2,715	€ 6,762	€ 6,762	€ 6,762	€ 6,762	€ 6,762	€ 4,047
Total	€ 72,983	€ 21,435	€ 15,543	€ 14,876	€ 6,762	€ 6,762	€ 6,762	€ 6,762	€ 4,047

Discounting these yearly costs at four per cent gives a total net present value of €72,983. That is, the loss of one job as a direct result of an authorisation decision would result in a total cost in discounted terms of €72,983. This compares with the gross salary paid to the employee of €26,027 per year, and a gross salary paid by the employer (i.e. including payroll taxes) of €33,809 per year. It also compares with the 'standard' approach to estimating the costs of unemployment, which focuses only on the temporary losses in output, of €51,216 discounted (first line in Table 7).

Generalising the example

The example provided above shows how the methodology for estimating the social costs of unemployment might be implemented in practice, and uses publicly available data for Spain for the purpose of illustration. It has been suggested that the data and assumptions used in a specific authorisation application can be expected to be more accurate and applicable to the situation in question. For instance, applicants will tend to have better information on the wages of those directly affected by the authorisation decision, and knowledge of their skill levels should allow better assumptions about their likely future employment prospects.

However, in some cases, applicants might not have good information about the workers likely to be affected by their authorisation decision. For instance, if an applicant is a manufacturer of a substance at the top of an extended supply chain, then he might know little about those employed by potentially large numbers of downstream users (and might not even know who and where those downstream users are). Moreover, although this guidance has been focussed on the authorisation of the use of substances of very high concern under REACH, similar issues arise when undertaking SEA of proposed REACH restrictions, which by their nature cover the entire EEA (although impacts might be distributed unevenly across areas, Member States, sectors and so on). In both of these situations, SEA are likely to be based on generalised national or union-wide values, and the methodology described above can be applied to any Member State for which the same data exist.[13]

[13] In practice, this means almost all countries of the EEA.

Where employment impacts are genuinely cross-EU and/or it is really not known in which Member State they are mostly likely to apply, a mean value estimate for the EU-28 might be applicable (albeit frown with more uncertainty than the country-specific estimates as exemplified for Spain in Table 7). Table 8 presents the net present value of the social costs of one lost job in the EU-28 in 2014, estimated using the same methodology as in Table 7. Value components are obtained using Eurostat unemployment duration data for the EU-28[14], population-weighted average wage and tax rates based on Rogers and Philippe (2014) data, and the same assumptions as before for the other components.

Table 8: Discounted net present value of the social costs of losing one job in EU-28, 2014

	PV	Nominal cost – Year 1	Nominal cost – Year 2	Nominal cost – Year 3	Nominal cost – Year 4	Nominal cost – Year 5	Nominal cost – Year 6	Nominal cost – Year 7	Nominal cost – Year 8
Lost output	€ 57,693	€ 40,120	€ 20,676	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Leisure time	-€ 20,342	-€ 14,146	-€ 7,290	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Job search	€ 1,271	€ 884	€ 456	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Recruitment	€ 8,560	€ 0	€ 0	€ 9,629	€ 0	€ 0	€ 0	€ 0	€ 0
Scarring	€ 39,644	€ 0	€ 3,889	€ 8,024	€ 8,024	€ 8,024	€ 8,024	€ 8,024	€ 4,135
Total	€ 86,827	€ 26,858	€ 17,730	€ 17,653	€ 8,024	€ 8,024	€ 8,024	€ 8,024	€ 4,135

The resulting total present value cost is €86,827 for the EU-28, compared with €72,983 estimated for Spain in Table 7. Note that these two total present values are just over twice (2.16 for EU-28, and 2.17 for Spain) the annual gross wage (including employer taxes) in each case. For annual gross wages excluding employer taxes (the simplest wage measure which is likely to be available for authorisation SEAs), the ratios are 2.72 and 2.8 respectively, evidently reflecting different employer tax rates in Spain compared with the EU average.

Further calculations were done to check whether these relationships represents a reliable rule-of-thumb for estimating the total present value of the social costs of one lost job on the basis of annual salary information. The results are presented in the Appendix to this report (see particularly Table A7). It can be seen that the gross wage (excl. employer taxes)-unemployment cost ratios vary between 1.63 (Luxembourg) and 3.51 (Slovakia), although the former figure is considered unreliable due to missing unemployment duration data. The higher ratios appear to be closely related to mean duration (correlation coefficient 0.79). It is a matter of judgement whether the population-weighted average for the EU-28 of 2.72 represents a reasonable rule of thumb given this spread. The figures in the Appendix can, of course, be used as a basis for estimating unemployment impacts in each country (except perhaps Luxembourg).

[14] 18.2 months, from http://appsso.eurostat.ec.europa.eu/nui/show.do?wai=true&dataset=lfsq_ugad.

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Appendix. Unemployment cost component estimates for the EU-28, net present value and nominal per year values

Table A1

Lost output	NPV	Nominal, year 1	Nominal, year 2	Nominal, year 3	Nominal, year 4	Nominal, year 5	Nominal, year 6	Nominal, year 7	Nominal, year 8	Nominal, year 9
AUSTRIA	€ 45,448	€ 47,266	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
BELGIUM	€ 91,345	€ 62,111	€ 34,203	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
BULGARIA	€ 9,764	€ 5,583	€ 4,755	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CROATIA	€ 26,213	€ 14,555	€ 13,214	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CYPRUS	€ 32,768	€ 26,355	€ 8,032	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CZECH REPUBLIC	€ 18,463	€ 14,465	€ 4,925	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
DENMARK	€ 42,556	€ 44,258	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ESTONIA	€ 18,866	€ 15,629	€ 4,151	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
FINLAND	€ 40,083	€ 41,686	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
FRANCE	€ 68,055	€ 55,805	€ 15,571	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
GERMANY	€ 75,743	€ 53,877	€ 25,891	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
GREECE	€ 53,601	€ 26,262	€ 26,262	€ 4,576	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
HUNGARY	€ 15,758	€ 11,787	€ 4,786	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
IRELAND	€ 65,548	€ 35,862	€ 33,601	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ITALY	€ 65,213	€ 38,574	€ 30,418	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LATVIA	€ 13,717	€ 10,619	€ 3,793	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LITHUANIA	€ 16,599	€ 12,026	€ 5,446	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LUXEMBOURG	€ 15,469	€ 16,088	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
MALTA	€ 19,889	€ 17,448	€ 3,366	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
NETHERLANDS	€ 67,428	€ 56,826	€ 13,831	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
POLAND	€ 13,277	€ 11,628	€ 2,268	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
PORTUGAL	€ 36,720	€ 21,452	€ 17,406	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ROMANIA	€ 8,070	€ 7,368	€ 1,066	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SLOVAKIA	€ 28,576	€ 13,540	€ 13,540	€ 3,417	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SLOVENIA	€ 29,930	€ 20,446	€ 11,108	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SPAIN	€ 51,216	€ 33,809	€ 20,234	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SWEDEN	€ 37,638	€ 39,143	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
UNITED KINGDOM	€ 57,658	€ 50,334	€ 10,016	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Mean EU28	**€ 57693**	**€ 40120**	**€ 20676**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**

Table A2

Leisure time	NPV	Nominal, year 1	Nominal, year 2	Nominal, year 3	Nominal, year 4	Nominal, year 5	Nominal, year 6	Nominal, year 7	Nominal, year 8	Nominal, year 9
AUSTRIA	€ 13,556	€ 14,099	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
BELGIUM	€ 25,428	€ 17,290	€ 9,521	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
BULGARIA	€ 4,173	€ 2,386	€ 2,032	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CROATIA	€ 9,852	€ 5,470	€ 4,967	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CYPRUS	€ 16,896	€ 13,589	€ 4,142	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CZECH REPUBLIC	€ 6,809	€ 5,335	€ 1,816	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
DENMARK	€ 16,863	€ 17,537	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ESTONIA	€ 7,114	€ 5,893	€ 1,565	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
FINLAND	€ 14,643	€ 15,229	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
FRANCE	€ 19,785	€ 16,224	€ 4,527	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
GERMANY	€ 24,660	€ 17,541	€ 8,430	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
GREECE	€ 17,304	€ 8,478	€ 8,478	€ 1,477	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
HUNGARY	€ 5,084	€ 3,802	€ 1,544	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
IRELAND	€ 30,793	€ 16,847	€ 15,785	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ITALY	€ 22,506	€ 13,312	€ 10,498	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LATVIA	€ 5,066	€ 3,922	€ 1,401	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LITHUANIA	€ 6,392	€ 4,631	€ 2,097	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LUXEMBOURG	€ 6,094	€ 6,338	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
MALTA	€ 9,509	€ 8,342	€ 1,609	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
NETHERLANDS	€ 24,898	€ 20,983	€ 5,107	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
POLAND	€ 5,039	€ 4,413	€ 861	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
PORTUGAL	€ 14,118	€ 8,248	€ 6,692	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ROMANIA	€ 2,934	€ 2,679	€ 388	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SLOVAKIA	€ 10,466	€ 4,959	€ 4,959	€ 1,251	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SLOVENIA	€ 11,656	€ 7,963	€ 4,326	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SPAIN	€ 19,994	€ 13,199	€ 7,899	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SWEDEN	€ 13,918	€ 14,475	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
UNITED KINGDOM	€ 25,548	€ 22,302	€ 4,438	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Mean EU28	**€ 20342**	**€ 14146**	**€ 7290**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**

Table A3

Search costs	NPV	Nominal, year 1	Nominal, year 2	Nominal, year 3	Nominal, year 4	Nominal, year 5	Nominal, year 6	Nominal, year 7	Nominal, year 8	Nominal, year 9
AUSTRIA	€ 847	€ 881	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
BELGIUM	€ 1,589	€ 1,081	€ 595	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
BULGARIA	€ 261	€ 149	€ 127	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CROATIA	€ 616	€ 342	€ 310	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CYPRUS	€ 1,056	€ 849	€ 259	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CZECH REPUBLIC	€ 426	€ 333	€ 114	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
DENMARK	€ 1,054	€ 1,096	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ESTONIA	€ 445	€ 368	€ 98	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
FINLAND	€ 915	€ 952	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
FRANCE	€ 1,237	€ 1,014	€ 283	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
GERMANY	€ 1,541	€ 1,096	€ 527	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
GREECE	€ 1,081	€ 530	€ 530	€ 92	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
HUNGARY	€ 318	€ 238	€ 96	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
IRELAND	€ 1,925	€ 1,053	€ 987	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ITALY	€ 1,407	€ 832	€ 656	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LATVIA	€ 317	€ 245	€ 88	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LITHUANIA	€ 400	€ 289	€ 131	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LUXEMBOURG	€ 381	€ 396	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
MALTA	€ 594	€ 521	€ 101	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
NETHERLANDS	€ 1,556	€ 1,311	€ 319	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
POLAND	€ 315	€ 276	€ 54	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
PORTUGAL	€ 882	€ 515	€ 418	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ROMANIA	€ 183	€ 167	€ 24	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SLOVAKIA	€ 654	€ 310	€ 310	€ 78	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SLOVENIA	€ 729	€ 498	€ 270	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SPAIN	€ 1,250	€ 825	€ 494	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SWEDEN	€ 870	€ 905	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
UNITED KINGDOM	€ 1,597	€ 1,394	€ 277	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Mean EU28	**€ 1271**	**€ 884**	**€ 456**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**

Table A4

Recruitment and training costs	NPV	Nominal, year 1	Nominal, year 2	Nominal, year 3	Nominal, year 4	Nominal, year 5	Nominal, year 6	Nominal, year 7	Nominal, year 8	Nominal, year 9
AUSTRIA	€ 12,147	€ 0	€ 13,138	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
BELGIUM	€ 13,252	€ 0	€ 0	€ 14,907	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
BULGARIA	€ 1,191	€ 0	€ 0	€ 1,340	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CROATIA	€ 3,105	€ 0	€ 0	€ 3,493	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CYPRUS	€ 5,623	€ 0	€ 0	€ 6,325	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
CZECH REPUBLIC	€ 3,086	€ 0	€ 0	€ 3,472	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
DENMARK	€ 11,861	€ 0	€ 12,829	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ESTONIA	€ 3,335	€ 0	€ 0	€ 3,751	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
FINLAND	€ 11,654	€ 0	€ 12,605	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
FRANCE	€ 11,907	€ 0	€ 0	€ 13,393	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
GERMANY	€ 11,495	€ 0	€ 0	€ 12,931	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
GREECE	€ 5,388	€ 0	€ 0	€ 0	€ 6,303	€ 0	€ 0	€ 0	€ 0	€ 0
HUNGARY	€ 2,515	€ 0	€ 0	€ 2,829	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
IRELAND	€ 7,651	€ 0	€ 0	€ 8,607	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ITALY	€ 8,230	€ 0	€ 0	€ 9,258	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LATVIA	€ 2,266	€ 0	€ 0	€ 2,549	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LITHUANIA	€ 2,566	€ 0	€ 0	€ 2,886	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
LUXEMBOURG	€ 13,486	€ 0	€ 14,587	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
MALTA	€ 3,723	€ 0	€ 0	€ 4,188	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
NETHERLANDS	€ 12,124	€ 0	€ 0	€ 13,638	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
POLAND	€ 2,481	€ 0	€ 0	€ 2,791	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
PORTUGAL	€ 4,577	€ 0	€ 0	€ 5,149	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
ROMANIA	€ 1,572	€ 0	€ 0	€ 1,768	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SLOVAKIA	€ 2,778	€ 0	€ 0	€ 0	€ 3,250	€ 0	€ 0	€ 0	€ 0	€ 0
SLOVENIA	€ 4,362	€ 0	€ 0	€ 4,907	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SPAIN	€ 7,213	€ 0	€ 0	€ 8,114	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
SWEDEN	€ 12,055	€ 0	€ 13,038	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
UNITED KINGDOM	€ 10,739	€ 0	€ 0	€ 12,080	€ 0	€ 0	€ 0	€ 0	€ 0	€ 0
Mean EU28	**€ 8560**	**€ 0**	**€ 0**	**€ 9629**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**	**€ 0**

Table A5

Scarring costs	NPV	Nominal, year 1	Nominal, year 2	Nominal, year 3	Nominal, year 4	Nominal, year 5	Nominal, year 6	Nominal, year 7	Nominal, year 8	Nominal, year 9
AUSTRIA	€ 55,488	€ 1,495	€ 10,949	€ 10,949	€ 10,949	€ 10,949	€ 10,949	€ 9,453	€ 0	€ 0
BELGIUM	€ 61,288	€ 0	€ 5,582	€ 12,422	€ 12,422	€ 12,422	€ 12,422	€ 12,422	€ 6,841	€ 0
BULGARIA	€ 5,444	€ 0	€ 165	€ 1,117	€ 1,117	€ 1,117	€ 1,117	€ 1,117	€ 951	€ 0
CROATIA	€ 14,160	€ 0	€ 268	€ 2,911	€ 2,911	€ 2,911	€ 2,911	€ 2,911	€ 2,643	€ 0
CYPRUS	€ 26,257	€ 0	€ 3,665	€ 5,271	€ 5,271	€ 5,271	€ 5,271	€ 5,271	€ 1,606	€ 0
CZECH REPUBLIC	€ 14,391	€ 0	€ 1,908	€ 2,893	€ 2,893	€ 2,893	€ 2,893	€ 2,893	€ 985	€ 0
DENMARK	€ 54,260	€ 1,839	€ 10,691	€ 10,691	€ 10,691	€ 10,691	€ 10,691	€ 8,852	€ 0	€ 0
ESTONIA	€ 15,595	€ 0	€ 2,296	€ 3,126	€ 3,126	€ 3,126	€ 3,126	€ 3,126	€ 830	€ 0
FINLAND	€ 53,383	€ 2,167	€ 10,504	€ 10,504	€ 10,504	€ 10,504	€ 10,504	€ 8,337	€ 0	€ 0
FRANCE	€ 55,654	€ 0	€ 8,047	€ 11,161	€ 11,161	€ 11,161	€ 11,161	€ 11,161	€ 3,114	€ 0
GERMANY	€ 53,310	€ 0	€ 5,597	€ 10,775	€ 10,775	€ 10,775	€ 10,775	€ 10,775	€ 5,178	€ 0
GREECE	€ 26,099	€ 0	€ 0	€ 5,252	€ 5,252	€ 5,252	€ 5,252	€ 5,252	€ 5,252	€ 915
HUNGARY	€ 11,697	€ 0	€ 1,400	€ 2,357	€ 2,357	€ 2,357	€ 2,357	€ 2,357	€ 957	€ 0
IRELAND	€ 34,850	€ 0	€ 452	€ 7,172	€ 7,172	€ 7,172	€ 7,172	€ 7,172	€ 6,720	€ 0
ITALY	€ 37,707	€ 0	€ 1,631	€ 7,715	€ 7,715	€ 7,715	€ 7,715	€ 7,715	€ 6,084	€ 0
LATVIA	€ 10,558	€ 0	€ 1,365	€ 2,124	€ 2,124	€ 2,124	€ 2,124	€ 2,124	€ 759	€ 0
LITHUANIA	€ 11,913	€ 0	€ 1,316	€ 2,405	€ 2,405	€ 2,405	€ 2,405	€ 2,405	€ 1,089	€ 0
LUXEMBOURG	€ 63,074	€ 8,938	€ 12,156	€ 12,156	€ 12,156	€ 12,156	€ 12,156	€ 3,218	€ 0	€ 0
MALTA	€ 17,459	€ 0	€ 2,816	€ 3,490	€ 3,490	€ 3,490	€ 3,490	€ 3,490	€ 673	€ 0
NETHERLANDS	€ 56,750	€ 0	€ 8,599	€ 11,365	€ 11,365	€ 11,365	€ 11,365	€ 11,365	€ 2,766	€ 0
POLAND	€ 11,634	€ 0	€ 1,872	€ 2,326	€ 2,326	€ 2,326	€ 2,326	€ 2,326	€ 454	€ 0
PORTUGAL	€ 20,951	€ 0	€ 809	€ 4,290	€ 4,290	€ 4,290	€ 4,290	€ 4,290	€ 3,481	€ 0
ROMANIA	€ 7,386	€ 0	€ 1,260	€ 1,474	€ 1,474	€ 1,474	€ 1,474	€ 1,474	€ 213	€ 0
SLOVAKIA	€ 13,605	€ 0	€ 0	€ 2,708	€ 2,708	€ 2,708	€ 2,708	€ 2,708	€ 2,708	€ 683
SLOVENIA	€ 20,180	€ 0	€ 1,867	€ 4,089	€ 4,089	€ 4,089	€ 4,089	€ 4,089	€ 2,222	€ 0
SPAIN	€ 33,298	€ 0	€ 2,715	€ 6,762	€ 6,762	€ 6,762	€ 6,762	€ 6,762	€ 4,047	€ 0
SWEDEN	€ 55,379	€ 3,037	€ 10,865	€ 10,865	€ 10,865	€ 10,865	€ 10,865	€ 7,829	€ 0	€ 0
UNITED KINGDOM	€ 50,353	€ 0	€ 8,063	€ 10,067	€ 10,067	€ 10,067	€ 10,067	€ 10,067	€ 2,003	€ 0
Mean EU28	**€ 39644**	**€ 0**	**€ 3889**	**€ 8024**	**€ 8024**	**€ 8024**	**€ 8024**	**€ 8024**	**€ 4135**	**€ 0**

Table A6

Total costs per year	NPV	Nominal, year 1	Nominal, year 2	Nominal, year 3	Nominal, year 4	Nominal, year 5	Nominal, year 6	Nominal, year 7	Nominal, year 8	Nominal, year 9
AUSTRIA	€ 100,374	€ 35,544	€ 24,087	€ 10,949	€ 10,949	€ 10,949	€ 10,949	€ 9,453	€ 0	€ 0
BELGIUM	€ 142,047	€ 45,902	€ 30,859	€ 27,329	€ 12,422	€ 12,422	€ 12,422	€ 12,422	€ 6,841	€ 0
BULGARIA	€ 12,487	€ 3,346	€ 3,016	€ 2,456	€ 1,117	€ 1,117	€ 1,117	€ 1,117	€ 951	€ 0
CROATIA	€ 34,242	€ 9,426	€ 8,826	€ 6,404	€ 2,911	€ 2,911	€ 2,911	€ 2,911	€ 2,643	€ 0
CYPRUS	€ 48,808	€ 13,615	€ 7,814	€ 11,596	€ 5,271	€ 5,271	€ 5,271	€ 5,271	€ 1,606	€ 0
CZECH REPUBLIC	€ 29,557	€ 9,464	€ 5,130	€ 6,365	€ 2,893	€ 2,893	€ 2,893	€ 2,893	€ 985	€ 0
DENMARK	€ 92,869	€ 29,657	€ 23,521	€ 10,691	€ 10,691	€ 10,691	€ 10,691	€ 8,852	€ 0	€ 0
ESTONIA	€ 31,126	€ 10,104	€ 4,979	€ 6,877	€ 3,126	€ 3,126	€ 3,126	€ 3,126	€ 830	€ 0
FINLAND	€ 91,392	€ 29,576	€ 23,109	€ 10,504	€ 10,504	€ 10,504	€ 10,504	€ 8,337	€ 0	€ 0
FRANCE	€ 117,066	€ 40,595	€ 19,374	€ 24,554	€ 11,161	€ 11,161	€ 11,161	€ 11,161	€ 3,114	€ 0
GERMANY	€ 117,429	€ 37,432	€ 23,586	€ 23,706	€ 10,775	€ 10,775	€ 10,775	€ 10,775	€ 5,178	€ 0
GREECE	€ 68,866	€ 18,314	€ 18,314	€ 8,444	€ 11,555	€ 5,252	€ 5,252	€ 5,252	€ 5,252	€ 915
HUNGARY	€ 25,204	€ 8,222	€ 4,738	€ 5,186	€ 2,357	€ 2,357	€ 2,357	€ 2,357	€ 957	€ 0
IRELAND	€ 79,181	€ 20,068	€ 19,254	€ 15,779	€ 7,172	€ 7,172	€ 7,172	€ 7,172	€ 6,720	€ 0
ITALY	€ 90,051	€ 26,093	€ 22,208	€ 16,972	€ 7,715	€ 7,715	€ 7,715	€ 7,715	€ 6,084	€ 0
LATVIA	€ 21,791	€ 6,942	€ 3,845	€ 4,672	€ 2,124	€ 2,124	€ 2,124	€ 2,124	€ 759	€ 0
LITHUANIA	€ 25,085	€ 7,685	€ 4,796	€ 5,292	€ 2,405	€ 2,405	€ 2,405	€ 2,405	€ 1,089	€ 0
LUXEMBOURG	€ 86,316	€ 19,084	€ 26,743	€ 12,156	€ 12,156	€ 12,156	€ 12,156	€ 3,218	€ 0	€ 0
MALTA	€ 32,155	€ 9,627	€ 4,673	€ 7,677	€ 3,490	€ 3,490	€ 3,490	€ 3,490	€ 673	€ 0
NETHERLANDS	€ 112,961	€ 37,154	€ 17,642	€ 25,003	€ 11,365	€ 11,365	€ 11,365	€ 11,365	€ 2,766	€ 0
POLAND	€ 22,669	€ 7,491	€ 3,333	€ 5,116	€ 2,326	€ 2,326	€ 2,326	€ 2,326	€ 454	€ 0
PORTUGAL	€ 49,013	€ 13,720	€ 11,941	€ 9,439	€ 4,290	€ 4,290	€ 4,290	€ 4,290	€ 3,481	€ 0
ROMANIA	€ 14,277	€ 4,856	€ 1,963	€ 3,242	€ 1,474	€ 1,474	€ 1,474	€ 1,474	€ 213	€ 0
SLOVAKIA	€ 35,148	€ 8,891	€ 8,891	€ 4,952	€ 5,958	€ 2,708	€ 2,708	€ 2,708	€ 2,708	€ 683
SLOVENIA	€ 43,545	€ 12,981	€ 8,920	€ 8,996	€ 4,089	€ 4,089	€ 4,089	€ 4,089	€ 2,222	€ 0
SPAIN	€ 72,983	€ 21,435	€ 15,543	€ 14,876	€ 6,762	€ 6,762	€ 6,762	€ 6,762	€ 4,047	€ 0
SWEDEN	€ 92,023	€ 28,610	€ 23,904	€ 10,865	€ 10,865	€ 10,865	€ 10,865	€ 7,829	€ 0	€ 0
UNITED KINGDOM	€ 94,800	€ 29,425	€ 13,919	€ 22,147	€ 10,067	€ 10,067	€ 10,067	€ 10,067	€ 2,003	€ 0
Mean EU28	**€ 86827**	**€ 26858**	**€ 17730**	**€ 17653**	**€ 8024**	**€ 8024**	**€ 8024**	**€ 8024**	**€ 4135**	**€ 0**

Table A7

Summary of inputs	[A] Social cost per job loss	[B] Annual pre-displacement wage	[C] Annual wage incl. employer taxes	[D] Employer tax rate	[E] Mean duration (years) of unemployment	[F] Ratio of social cost per job loss over annual pre-displacement wage	[G] Ratio of social cost per job loss over annual wage incl. employer taxes
AUSTRIA	€ 100,374	€ 41,693	€ 54,743	31%	0.9	2.41	1.83
BELGIUM	€ 142,047	€ 46,810	€ 62,111	33%	1.6	3.03	2.29
BULGARIA	€ 12,487	€ 4,755	€ 5,583	17%	1.9	2.63	2.24
CROATIA	€ 34,242	€ 12,419	€ 14,555	17%	1.9	2.76	2.35
CYPRUS	€ 48,808	€ 23,574	€ 26,355	12%	1.3	2.07	1.85
CZECH REPUBLIC	€ 29,557	€ 10,795	€ 14,465	34%	1.3	2.74	2.04
DENMARK	€ 92,869	€ 53,166	€ 53,456	1%	0.8	1.75	1.74
ESTONIA	€ 31,126	€ 11,664	€ 15,629	34%	1.3	2.67	1.99
FINLAND	€ 91,392	€ 42,493	€ 52,521	24%	0.8	2.15	1.74
FRANCE	€ 117,066	€ 36,980	€ 55,805	51%	1.3	3.17	2.10
GERMANY	€ 117,429	€ 45,170	€ 53,877	19%	1.5	2.60	2.18
GREECE	€ 68,866	€ 20,604	€ 26,262	27%	2.2	3.34	2.62
HUNGARY	€ 25,204	€ 9,173	€ 11,787	29%	1.4	2.75	2.14
IRELAND	€ 79,181	€ 32,381	€ 35,862	11%	1.9	2.45	2.21
ITALY	€ 90,051	€ 29,704	€ 38,574	30%	1.8	3.03	2.33
LATVIA	€ 21,791	€ 8,592	€ 10,619	24%	1.4	2.54	2.05
LITHUANIA	€ 25,085	€ 9,131	€ 12,026	32%	1.5	2.75	2.09
LUXEMBOURG	€ 86,316	€ 52,902	€ 60,779	15%	0.3	1.63	1.42
MALTA	€ 32,155	€ 15,862	€ 17,448	10%	1.2	2.03	1.84
NETHERLANDS	€ 112,961	€ 48,109	€ 56,826	18%	1.2	2.35	1.99
POLAND	€ 22,669	€ 9,631	€ 11,628	21%	1.2	2.35	1.95
PORTUGAL	€ 49,013	€ 17,335	€ 21,452	24%	1.8	2.83	2.28
ROMANIA	€ 14,277	€ 5,968	€ 7,368	23%	1.1	2.39	1.94
SLOVAKIA	€ 35,148	€ 10,015	€ 13,540	35%	2.3	3.51	2.60
SLOVENIA	€ 43,545	€ 17,611	€ 20,446	16%	1.5	2.47	2.13
SPAIN	€ 72,983	€ 26,027	€ 33,809	30%	1.6	2.80	2.16
SWEDEN	€ 92,023	€ 41,338	€ 54,327	31%	0.7	2.23	1.69
UNITED KINGDOM	€ 94,800	€ 45,464	€ 50,334	11%	1.2	2.09	1.88
Mean EU28	**€ 86827**	**€ 31,974**	**€ 40,120**	**25%**	**1.5**	**2.72**	**2.16**