

Evaluating the Net Additionality of Industrial Development Assistance in Ireland

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Abstract

This paper examines an approach to estimating the net additionality of financial assistance to indigenously-owned firms in Ireland for the period 2000 to 2002. Using a sample of Enterprise Ireland assisted-firms an innovative self-assessment case study methodology was adopted in order to test the ways in which estimates of partial deadweight can be derived. The results show that the net additionality of Enterprise Ireland assistance can be estimated as around 50 per cent for this sample of case studies which represent a pool of clients which accounted for just-over two-thirds of the financial assistance provided by Enterprise Ireland in the period of the study.

1. Introduction

An important question in any evaluation of the effectiveness of industrial development policy is what would have happened to firm performance in the absence of assistance from government agencies whose responsibility it is to stimulate growth and competitiveness. To produce an assessment of this counter-factual scenario involves considering two key components of additionality, they are, *deadweight* and *displacement*. In reality, all or part of the growth of an assisted firm might have occurred anyway. This is referred to as *deadweight*. Even with the situation of ‘zero deadweight’, whereby all firms indicate that in the absence of financial assistance they would not have been able to create any new employment, there remains the possibility that assistance given to one firm displaces jobs in other firms within the national economy. This concept is referred to as *displacement*. Taken together deadweight and displacement allow some assessment of the additional impact of financial assistance provided by a public agency such as Enterprise Ireland which is the subject of this paper.

The paper presents the results of a study of the net additionality of support to Irish industry which had the overall objective to derive estimates of deadweight and displacement in Enterprise Ireland (EI) assisted firms. In order to achieve this objective the study involved

the application of a case study approach which involved deriving an estimate of deadweight and displacement based on information obtained from face-to-face interviews with the relevant personnel of 42 Enterprise Ireland assisted firms. This approach is a development of the earlier work on Shannon Development by Lenihan (1999; 2001).

Section 2 provides some background on industrial policy in Ireland and the role of Enterprise Ireland in particular. Section 3 of the paper sets out the main methodological issues associated with this impact evaluation and presents a rationale for the approach adopted by the study team. Finally, Section 4 provides estimates of deadweight and displacement that permit an overall assessment of the net additionality of Enterprise Ireland assistance.

2. Enterprise Ireland and Industrial Policy in Ireland

With a menu of tax breaks and subsidies, Ireland has traditionally been successful in encouraging foreign companies to set up branches in Ireland. In 1973, the Industrial Development Authority (IDA) for Ireland set out a plan to concentrate on attracting such investments as the electronics, chemicals and other ‘high-technology’ sectors. As the 1970s unfolded foreign companies that had located in the ROI before 1973 showed disturbing signs of weakness. It was also realised that most of the foreign firms that located in Ireland in the 1960s came with technically mature, labour-intensive products such as textiles, clothing, footwear, plastics and light engineering. Therefore, the Irish subsidiaries (basically branch plants) generally required few skills to perform their operations.

Since the 1980s there have been several major reports on the nature and orientation of industrial policy in Ireland. In July 1980, the “Telesis Group” was commissioned by the National Economic and Social Council (NESC) to assess industrial policy. Telesis concluded that industrial policy in Ireland suffered from a lack of a clear regional focus and an over-emphasis on capital grants to firms. Further, it recommended that:

- tax-based lending should be diverted away from the non-traded sector;
- firms should be encouraged to adopt a strategic approach to their business;
- greater amount of government resources should be earmarked for the growth of the domestic traded sector;

- government should use ‘carrots and sticks’ to encourage domestic firms to engage in skilled sub-supply;
- greater efforts should be made to induce foreign firms to contribute to the development of domestic firms; overemphasis on foreign industry;
- the development of an internationally competitive indigenous base.

The main recommendations of the Telesis report were given support in the Irish Government's “Industrial Policy White Paper” in 1984.

The Culliton Report (1992) took these developments a step further by recommending a reorganisation of existing grant awarding agencies into two main agencies, one of which should address the needs of indigenous firms, the other should focus on the attraction of foreign owned industry. Of major importance was the conclusion that greater use should be made of equity as opposed to non-repayable grants and the emphasis upon the promotion of growth-oriented industrial clusters. In 1993 the agencies responsible for industrial policy were restructured - ‘Forbairt’ was established to promote indigenous industry and the IDA was given a mandate to attract Foreign Direct Investment (FDI).

The “Task Force on Small Business” (1994) resulted in two key policy initiatives. First, the “Small Business Operational Programme” and second, “Shaping our Future - A strategy for Enterprise in Ireland in the 21st Century”, which together provided a longer-term strategic framework for the promotion and subsequent development of an enterprise sector in Ireland. The “Operational Programme for Industrial Development 1994-1999” focussed on helping firms, particularly small indigenous firms increase sales over the five year period 1994-1999. In July 1998 ‘Forbairt’ ceased to exist and a new agency with responsibility for indigenous industry, ‘Enterprise Ireland’ was established. Enterprise Ireland (EI) was established in 1998.

Enterprise Ireland works with Irish industry and has a client list containing over 3,000 Irish manufacturing and internationally traded service companies. Its objective is to stimulate growth and competitiveness in existing Irish companies through the exploration of new ideas and markets as well as assisting the creation of “High Potential Start-Up Companies” (HPSUs).

3. Methodology: the Case Study Approach

3.1 Introduction

The case study approach involved the use of a structured questionnaire with respondents during face-to-face interviews which lasted approximately 45 minutes. The respondents comprised the relevant personnel (e.g. managing directors, accountants, financial controllers) of firms that received financial assistance from EI during the years 2000 and 2001. The reason that the face-to-face interview technique was adopted was that in the case of EI assisted firms large quantities of relevant published data were not available. Therefore the only true way to get a grip on the levels of deadweight and displacement associated with EI assistance was to interview the recipients of financial assistance. The interview approach is also useful for examining the underlying processes at work, that is, cause and effect.

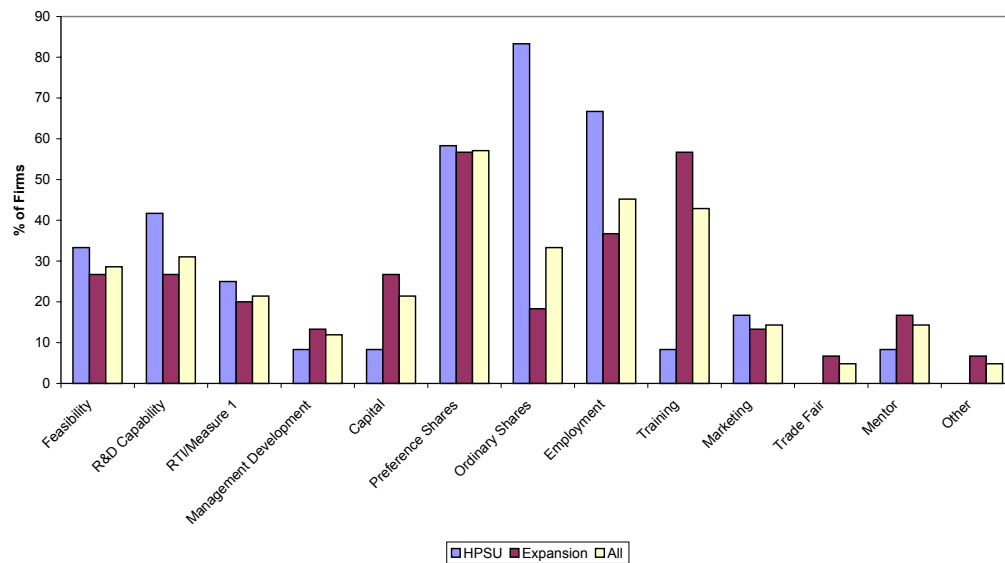
To be included in the survey the following definition of an assisted Enterprise Ireland firm was adopted. The firms (excluding those firms which had received only RTI and e-business support) must have been approved a package of assistance of more than €127,000 in the year 2000 and that by the time of the proposed interview (Autumn 2002) at least 50 per cent of that assistance had been paid. Due to the difficulty of recruiting the required number of firms for the case studies this was relaxed to a 40 per cent drawdown of financial assistance and approvals from the first part of 2001 had to be included.

In order to ensure that the 42 case studies were meaningful in the context of the EI client portfolio an analysis was undertaken to ascertain the scale of financial assistance received by the 'pool' of EI clients conforming to the parameters of the study. The amount of financial assistance paid to EI clients defined above in the two years 2000 and 2001 was €86 million out of a total expenditure of €126 million (excluding universities and CEC). Therefore, the 42 case study firms represent just over two-thirds (68.2%) of EI expenditure in 2000 and 2001. On average, EI provided around 11 per cent of total costs of the projects assisted in the 42 case study firms. It was agreed with Enterprise Ireland that the study should incorporate an assessment of the effectiveness of financial assistance to both established firms (Expansions) and to start-up firms (HPSUs). Overall, 12 HPSUs and 30 Expansion firms were included in the impact survey case studies.

Figure 1 illustrates the range of assistance received from Enterprise Ireland. This data is compiled from the face-to face interview and not from the information held on file by Enterprise Ireland. The most common form of financial assistance from Enterprise Ireland was share capital (mostly in the form of preference shares) followed by financial assistance associated with employment and training. Beyond this financial assistance with feasibility studies and R&D capability aspects of the project was acknowledged by between 25-30 per cent of the sample firms.

Two major differences between HPSUs and Expansions with respect to the nature of the assistance received is evident. First, HPSUs stated that they were more likely to be in receipt of ordinary shares compared to Expansion firms. Second, Expansions were more likely to have received financial assistance for training staff.

Figure 1: Nature of Assistance from Enterprise Ireland



3.2 The Survey Questionnaire

A questionnaire was used to give structure and to ensure consistency during face-to-face interviews. The goal of standardised measurement is central to survey research. It is

considered imperative to keep the wording of questions standard across respondents. As Barnekov and Hart (1993) outlined:

“Increasingly, it is being realised that the way in which questions are posed is as important to a successful evaluation as the methods which are used to analyse the information collected” (page 1471).

The ultimate aim of the interview technique is to utilise the views of individuals (firms) directly affected by policy in an attempt to identify a ‘without policy’ position, that is, ‘counter-factual position’. As Reid (1995) stated:

“Field work methods which involve intensive interviews with respondents offer the potential for very accurate and complete data and very high response rates” (page 15).

There are, as one would expect, inherent difficulties associated with the face-to-face interview technique. The key point is that such a qualitative approach to policy evaluation is people centred. The approach relies on the accuracy of the perceptions of decision makers with respect to their ‘counter-factual position’, as well as honesty and candidness regarding sensitive issues.

It should always be borne in mind that firms have an interest in the continuation of public support and may thus, over-emphasise the effect assistance has (and thus underestimate the level of deadweight for example) for fear that findings might influence authorities to giving them less or in the extreme case no assistance next time round. It could also be argued that respondents may be reluctant to openly admit that an external input has influenced firm behaviour and hence under-emphasise the effects. In this case, respondents may attribute success to their own efforts, motivation, foresight etc. This notion of respondents being careful with their responses is generally termed the ‘respondents effect’. Another possibility is that respondents simply do not know all the possible effects their investments may cause.

As King (1990) argued:

“Memory and the evidence of documentation that is inevitably selective, can easily distort ones views of the balance of probabilities in hypothetical circumstances some years in the past” (page 49).

An additional frequently cited criticism of the survey/interview methodological approach regards the issues of ‘snapshot’ approach and timing. Evaluation is often a ‘one-off’ exercise conducted soon after a policy intervention has ended or even while it is still in operation. As a follow on from this, there may be an underestimation or overestimation of deadweight. This is due to the fact that many government interventions have associated delay effects. Their positive impact may diminish with time, whereas effects such as displacement may take some time to come to the surface. This implies, therefore, that the timing of face-to-face interviews is of utmost importance. It is very difficult to say what the ideal is. Ultimately, the researcher is faced with a trade-off between (a) allowing enough time for the full impacts of policy to take effect and (b) not delaying the evaluation for too long so that respondents can still recall, in detail, the impacts of the policy intervention as clearly as possible. The problems associated with issues of memory and evidence of documentation, as outlined by King (1990), are key issues of concern here.

To ensure that respondents offered a ‘consistent counterfactual scenario’ and adapted as easily as possible to the hypothetical line of questioning regarding assistance received from EI, the following measures were undertaken by the research team;

- Respondents were telephoned to explain what the interview would entail. Therefore, (based on previous experience by the research team) by the time the interviewer arrived, respondents were quite ready to answer questions regarding the counterfactual type scenario. This level of focus is necessary given the plethora of assistance measures available to firms in the Republic of Ireland.
- The research team insisted that interviews were only carried out with the respondents who were directly involved in the application for financial assistance. This should ensure a high level of accuracy and reliability regarding the information provided. Further, all interviews were tape-recorded to ensure an accurate record of the interview. Transcripts were also made to facilitate subsequent analysis and interpretation by the research team.
- The questionnaire was piloted on three firms to ensure questions were clear and that there was no confusion regarding the issues addressed. This is imperative when dealing with such sensitive issues as deadweight and displacement. The piloted firms took part in a “participating” pre-test, that is, they were told that it was a practice run and were asked to explain their reactions and answers. Following the ‘piloting’, some very minor adjustments were made to the questionnaire. These adjustments regarded the meaning, difficulty and ordering of questions being asked.

The 'flow' and 'naturalness' of the questionnaire was also improved on, in an attempt to guarantee respondent interest and attention.

3.3 Structure of the Questionnaire

This section focuses on the details (and underlying rationale) of the questions posed. As a starting point, the questionnaire tried to establish whether the recipient of financial assistance was a first time or repeat client of EI. The rationale for addressing this question is that it is generally believed that start-up assistance have more impact on firms than do subsequent financial assistance. The remainder of the questionnaire focused on the specifics of the financial assistance received by the firm from EI.

Given that deadweight and displacement are sensitive issues, some general questions were asked of respondents to begin with, to settle them into the interview, before addressing the two pertinent issues of interest. As Reid (1995) states: "*Lowering the possibility level of threat in an interview by starting with benign general question*" (page 10).

In the preliminary stages of the interview, recipients of financial assistance were asked questions regarding the following: year firm was established, legal form of company, main types of products/services of company, type of financial assistance received from EI, description of project aided (including project aims and objectives) and so on. Once these preliminary questions were addressed, questions which served as measures of deadweight were then asked. This technique was also used to ease the interviewee into the deadweight line of questioning. The words deadweight and displacement were never used at any stage by the interviewer during interviews. The following line of questioning was pursued (which serves as useful measures of deadweight) of respondents: did you undertake a financial appraisal of the project? If yes, did this appraisal include financial assistance from EI? The general belief here is that (as per Sheehan, 1993) if financial assistance is included as part of the investment appraisal then it is likely that the recipient really needed the assistance for the project to go ahead (implying low levels of deadweight). On the other hand, where financial assistance is omitted, it is generally believed that this implies high deadweight levels.

3.4 Estimating Deadweight

To assess deadweight directly, the following line of questioning was pursued: Respondents were asked to answer the hypothetical question of what would most likely have happened (with hindsight) if they had not received financial assistance from Enterprise Ireland for the specific year in question. More precisely, respondents were asked:

“In the absence of financial assistance from EI (in 2000 or 2001 depending on when intervention occurred)) would you have (choose one option only)?

- a) Gone ahead as now unchanged, that is, same scale, time and location.*
- b) Gone ahead but at a different location, (i.e. outside of Ireland) (Request precise details in follow up questions).*
- c) Gone ahead at a later date (i.e. delayed the project) (request precise details in follow up questions).*
- d) Gone ahead but on a reduced scale (i.e. changed the nature of the project-removed certain features such as the research function) (request precise details).*
- e) Combination of c. and d. (request precise details in follow up questions).*
- f) Abandoned the project (request precise details in follow up questions).”*

When respondents replied that in the absence of the financial assistance their projects would have gone ahead elsewhere, on a smaller scale, at a later date, or a combination of later date and reduced scale they were asked for precise details of these alternative scenarios.

The above questions facilitate estimates of ‘partial’ versus ‘pure’ (‘full’) degrees of deadweight, and help to provide a picture of what was most likely to have happened if the award had not been made. Option (a) implies ‘pure’ (‘full’) deadweight. Options (b), (c), (d) and (e) all imply ‘partial’ degrees of deadweight; option (f) implies zero deadweight.

In an attempt to quantify the impact of financial assistance received from EI, firms were also asked to assess the number of jobs in their company which ‘are now’ directly dependent on the financial assistance received from EI for the specific year in question (2000 or 2001). They were also asked to quantify the percentage of current turnover and exports attributable to the financial assistance received from EI for the specific year in question.

As a final measure of deadweight, firms were probed regarding their access to alternative sources of funding (as per Robinson and Wren 1987). More precisely, they were asked:

"How would you have obtained the extra funds needed if no financial assistance was provided to you by EI?"

- *Internal funds*
- *Bank*
- *Alternative grant (specify source)*
- *Other, please specify....."*

As a follow-up question, they were also probed with regards to how successful they think they would have been in accessing these alternative sources. To minimise deadweight, firms should be able to satisfactorily demonstrate that all other avenues of finance have been exhausted.

3.5 Estimating Displacement

The questionnaire attempted to seek information from the owner-managers on two areas which together can be used to derive an estimate of displacement. First, to establish the extent to which EI assisted firms sell their products nationally rather than internationally. This was addressed by asking the following question: *"What percentage of your current sales are made in each of the following markets? Ireland, UK (including Northern Ireland), Other EU, Other Non-EU"*.

Second, to establish the extent to which sales by EI assisted firms displaces output from other national firms rather than imports. This was assessed by the following questions: *"How many competitors do you have? (I mean businesses you compete with in your main markets)"* and *"Who are your competitors and where are they based?"* The assumption here is that where most competitors are known to be situated nationally, there is a strong assumption that displacement will occur within the assisted area, that is, nationally. However, where competitors are located abroad there is a presumption of no displacement of assisted area jobs. Combining these two pieces of information allows us to derive an estimate of displacement for the case study firms.

4. The Additionality of Enterprise Ireland Support

4.1 Introduction

In this section an evaluative framework is provided in which the 'additionality' (in terms of deadweight and displacement) associated with the assistance approved by firms in 2000 or 2001 is examined. The years 2000 or 2001 were chosen as these were the most recent years for which information regarding financial assistance approvals was available at the outset of this research project.

4.2 Estimating Deadweight

4.2.1 Categories of Deadweight

In this study, deadweight is defined as the degree to which projects would have gone ahead without financial assistance from Enterprise Ireland in 2000 or 2001. As discussed above the estimates of deadweight are based on a self-assessment of the counterfactual by the owner-manager of the firm and as a result may be subject to a respondent's effect in both directions. That is, an under or over exaggeration of the effects of EI financial assistance. In this study an attempt to minimise this 'respondent effect' was undertaken by the way survey questions were designed and utilised in the owner-manager face-to-face interviews. A related issue concerns the possibility of bias introduced into the analysis by the random effect of who agreed to be interviewed within the time-scale set aside for the case studies. This problem is controlled for by a series of sensitivity analyses which were designed to isolate the effects of those firms ('big influencers') which were having an undue effect on the estimates of the impact of EI assistance.

The impact of financial assistance provided to firms by Enterprise Ireland is measured in terms of the net change in employment between date of financial assistance approved and date of interview. The percentage of jobs maintained, along with those lost and gained, and the total number of jobs lost or gained over the study period is calculated. In order to

estimate deadweight it is necessary to calculate how many of these jobs would still have been created without assistance, that is, how many are truly additional.

The definition of deadweight used in this study takes account of the various degrees or levels of deadweight measured by time, location and scale (or a combination). The issue here is to establish which projects would have gone ahead but in a different form, for example, scaled-down version, or in a different location, or at a later date, without the assistance. When respondents said that in the absence of assistance their project would have gone ahead elsewhere, on a smaller scale, or at a later date, they were asked for precise details of these alternative scenarios. These questions facilitated estimates of ‘partial’ versus ‘pure’ (‘full’) degrees of deadweight and helped to provide a picture of what was most likely to have happened if the award had not been made. Table 1 shows the responses to the different categories of deadweight for the sample firms.

As can be seen from Table 1, the vast majority of firms (73.8%) fit into the ‘partial’ deadweight categories. More precisely, 35.7 per cent fit into the ‘reduced scale’ category, followed by 28.6 per cent fitting into the ‘later date and reduced scale’ category with a smaller number of firms in the ‘later date’ (7.1%) and ‘different location and later date’ (2.4%) partial deadweight categories. Finally, 19 per cent of firms reported ‘pure’ (100%) deadweight with 7.1 per cent of firms reporting ‘zero’ deadweight. Therefore, it is possible to conclude that 81 per cent of the case study firms were impacted to some degree by the financial assistance provided by EI.

From these results we conclude that at the lower end of the spectrum deadweight can be broadly estimated for EI financial assistance as **19 per cent**¹. In other words, across the sample we can state that this proportion of firms did not need any assistance from EI to undertake and complete their business development project. This estimate has been used widely in many studies which seek to provide an estimate of the counter-factual position using the self-assessment methodology used in this study.

¹ Of the 42 firms in the sample, 7 (16.7%) firms would have grown at the same rate; 27 (64.3%) would have grown more slowly; 7 (16.7%) would have declined and finally one (2.4%) respondent replied that he was unsure. These findings enable us to derive another ‘**crude**’ **deadweight estimate of 16.7 per cent**. This, in itself, provides a useful check on the self-assessment methodology for ‘pure’ deadweight.

Table 1: Deadweight Categories (Owner-Manager Self-Assessment)	
Deadweight Category	Percentage of Firms (no. of firms)
Pure (100%) deadweight ^(a)	19% (8)
Partial deadweight ^(b) (different location)	0% (0)
Partial deadweight ^(c) (later date)	7.1% (3)
Partial deadweight ^(d) (reduced scale)	35.7% (15)
Partial deadweight ^(e) (later date and reduced scale)	28.6% (12)
Partial deadweight ^(f) (different location and later date)	2.4% (1)
Zero deadweight ^(g)	7.1% (3)
<p>(a) Pure deadweight implies the firm would have gone ahead with the project at the same scale, time and location in the absence of assistance from EI in 2000/2001.</p> <p>(b) Partial deadweight (different location) implies firm would have gone ahead with the project at a different location but otherwise unchanged.</p> <p>(c) Partial deadweight (later date) implies firm would have gone ahead with the project at a later date but otherwise unchanged (that is, delayed the project).</p> <p>(d) Partial deadweight (reduced scale) implies firm would have gone ahead with the project anyway at a reduced scale but otherwise unchanged.</p> <p>(e) Partial deadweight implies a combination of later date and reduced scale but otherwise unchanged.</p> <p>(f) Partial deadweight implies a combination of different location and later date but otherwise unchanged.</p> <p>(g) Zero deadweight implies firm would have abandoned the project in the absence of assistance from EI in 2000/2001.</p>	
Source: Enterprise Ireland Impact Survey (2002)	

However, this still leaves unresolved the issue of partial deadweight and how that can be combined with the 'pure' deadweight estimate of 19 per cent in order to arrive at a more sensitive and realistic estimate of deadweight. This project used an innovative methodology which was designed to calibrate in terms of employment a measure of deadweight which incorporates a range of partial deadweight options.

4.2.2 An Evaluative Framework for Estimating Deadweight

In Table 2 the net change in employment for the 42 firms in the sample between the year of the EI financial assistance (either 2000 or 2001) and 2002 is calculated. For the purposes of this analysis the employment data from the Forfás Employment Survey was used. It shows the percentage of jobs maintained along with those lost and gained, and the total numbers of jobs lost or gained over the study period. Overall, just under 50 per cent of firms lost jobs or experienced no change in terms of employee numbers. The other half of firms increased the number they employed during the study period. Overall, the total number of jobs gained was 53. To estimate deadweight it is necessary to calculate how many of these jobs would still have been created without financial assistance, that is, how many of these jobs can be considered as truly additional.

Table 2: Net Employment Change – Case Studies		
Number (percentage) of firms	Percentage of jobs lost or gained	Total number of jobs lost or gained (net employment change)
17 (40.5)	decrease	-222
3 (7.1%)	no change	0
22 (52.4%)	increase	275
Total jobs gained:		53
Source: Enterprise Ireland Impact Survey (2002)		

4.2.3 Net Employment Change Accounting for EI Impact

The impact of Enterprise Ireland assistance is measured in terms of changes in employment over the study period. For the purpose of calculating net employment change accounting for additionality a number of assumptions were made about the change in employment during the study period. The assumptions are as follows:

- The assumption for those firms which fit into the ‘pure’ deadweight category is that there was zero impact in terms of employment over the study period. This occurs in the case of 8 firms (e.g. one of the firms in the sample employed 15 people in 2000, this figure increased to 22 in 2002. Thus net employment change over the study period in the case of that firm equals 7. Given that the firm opted for the ‘pure’ deadweight option, we can assume that there is no impact of EI assistance in terms of employment. Therefore, for that particular firm net employment change accounting for additionality equals 7 jobs).
- The following subset of assumptions are made regarding firms that fit into the ‘partial deadweight’ categories²:
 - *Alternative location.* All of the jobs occurring in firms that would have chosen an alternative location *outside* of Ireland will be counted as additional, and thus do not affect the net employment-change figure (the inherent assumption being that without financial assistance from EI these additional jobs would not have accrued nationally). In instances where the ‘*alternative location*’ option was relevant respondents were asked the following questions “Where would the project have been located outside Ireland” and “Why would you have chosen this location?”
 - *Later date (delayed project).* The inherent assumption here is that the jobs have been in existence for either 1 or 2 years (depending on whether EI assisted the firm in 2000 or 2001).³ For example, if we assume that the jobs have been in existence for two years, then, if a project was brought forward by six months because of financial assistance then the remaining eighteen months are regarded as deadweight. For example, take a firm which would have delayed the project by eighteen months in the absence of assistance: the firm’s net employment change equals eight jobs; however, net employment-change accounting for deadweight equals 75 per cent of 8, that is 6 jobs. In instances where the “*Later date (delayed project)*” option was relevant respondents were asked the following questions “By how long would the project have been delayed? (in terms of months)” and “Why would the project have started up/expanded at this later date”
 - *Reduced Scale.* Reduced scale is examined in terms of direct questions to respondents such as “By how much would you have reduced the scale of the project? If relevant the respondent was asked to indicate whether this could be expressed in terms of ‘numbers employed’, ‘size of premises or nature of equipment installed’ ‘sales to particular markets’ ‘Research and Development’, ‘amount of training envisaged’. The impact of reduced scale in terms of numbers employed is used to specifically measure the impact on employment (e.g. one of

² ‘Partial deadweight’ is defined in terms of scale, time, location or a combination of time and scale or location and later date.

³ Take the hypothetical example of a firm that received financial assistance from EI in 2000 whereas face-to-face interviews were not carried out until 2002 (that is, 2 years later). Thus the inherent assumption here is that these jobs have been in existence for two years. Alternatively, for those firms that received assistance in 2001 the inherent assumption is that the jobs have been in existence for one year.

the firms in the sample had a net employment change over the study period of -2. When asked about how much the project would have been reduced in terms of numbers employed in the absence of EI assistance, the respondent replied 6 jobs. Therefore, the impact of EI assistance equals 6 jobs. Thus, net employment change accounting for additionality equals -8). In cases where respondents replied that there was no employment change (but reduced scale would have been in the form of sales to particular markets, R&D, or amount of training envisaged) or they felt that there was an effect in terms of numbers employed but were unable to quantify the impact, the % contribution of EI financial assistance to the overall financing of the project was used as a proxy for reduced scale (this information was ascertained in response to the question "*How was the project financed in total? Enterprise Ireland assistance, Internal Funds, Bank Loan, Equity etc*"). For example, where a financial accounts for 30 per cent of total financing, then the assumption will be made that the scale of the project would have been reduced by 30 per cent in the absence of the financial and thus the net employment-change has been reduced by 30 per cent.

- *Combination of later date and reduced scale:* summation of 2 and 3 as detailed above.
- *Combination of different location and later date:* summation of 1 and 2 as detailed above.
- If the project would have been abandoned without financial assistance from Enterprise Ireland, the assumption was that all of the jobs in this category were fully additional, that is, 'zero deadweight' (the same logic is used in the case of firms who either increased, maintained or decreased the numbers of jobs over the study period).

At the time of the interviews with the owner-managers of the 42 case studies the Irish economy had been experiencing a rather mixed performance with a result that almost half of the firms had actually declined in terms of employment since they had received assistance from EI in 2000 or 2001 (see Table 2). This had a major impact on the methodology designed to measure partial deadweight in that for the sample overall this produced a negative figure for "*net employment change accounting for additionality*" because the overall calculation of the impact of EI assistance in terms of employment was negative. As a result it was decided to undertake the deadweight estimate for two groups of firms depending on their employment performance:

- Increase or no change in employment
- Decline in employment

Table 3 incorporates the above assumptions in an estimation of deadweight for the firms in the sample who had increased or experienced no change in employment. The net employment change over the study period for these 25 firms was 275 jobs. The overall impact of EI financial assistance in terms of employment equals 146.2 jobs (i.e. 146 jobs). The net employment change figure for jobs accounting for additionality equals 128.8 (i.e. 129 jobs). In other words because of EI financial assistance, there was an increase of 146 jobs over the study period. Thus, deadweight for this group of firms is given by:

$$\text{Deadweight} = 275 \text{ jobs} - 146 \text{ jobs} / 275 \text{ jobs} * 100 = 46.9\%$$

that is, 46.9 per cent of the additional jobs would have occurred anyway. Thus additionality, net of deadweight, is 53.1 per cent of the jobs created.

Table 3 Additionality and Deadweight (Increase/Static only)					
Deadweight Category	Number of Employees in		Net Employment change	Impact of EI assistance in terms of employment	Counterfactual (expressed in terms of net employment change)
	2000/2001	2002			
Pure	305	387	82	0	82
Alternative location	-	-	-	-	-
Later date	33	42	9	9	0
Reduced scale	510	581	71	44.8	26.2
Later date and reduced scale	307	373	66	45.4	20.6
Different location and later date	95	103	8	8	0
Zero (Project abandoned)	16	55	39	39	0
Total:	1266	1541	275	146.2	128.8

Source: Enterprise Ireland Impact Survey (2002)

This estimate of deadweight included 6 firms who had indicated that in the absence of EI financial assistance they would have gone ahead with their project anyway. Table 4 repeats the analysis for only those firms recording partial deadweight responses and had recorded a net increase or static change in employment since they had received EI financial assistance (n=19). The net employment change over the study period for these 19 firms was 193 jobs. The overall impact of EI financial assistance in terms of employment remains 146.2 jobs (i.e. 146 jobs) as the 6 firms removed from the analysis had zero jobs associated with EI assistance. The net employment change figure for jobs accounting for additionality equals 46.2 (i.e. 46 jobs). In other words because of EI financial assistance, there was an increase of 146 jobs over the study period. Thus, deadweight for this group of firms is given by:

$$\text{Deadweight} = 193 \text{ jobs} - 146 \text{ jobs} / 193 \text{ jobs} * 100 = 24.4\%$$

that is, 24.4 per cent of the additional jobs would have occurred anyway. Thus additionality, net of deadweight, is 75.6 per cent of the jobs created.

Table 4 Additionality and Deadweight (Increase/Static Partial Deadweight Category only)					
Deadweight Category^(a)	Number of Employees in		Net Employment change	Impact of EI assistance in terms of employment	Counterfactual (expressed in terms of net employment change)
	2000/2001	2002			
Pure	-	-	-	-	-
Alternative location	-	-	-	-	-
Later date	33	42	9	9	0
Reduced scale	510	581	71	44.8	26.2
Later date and reduced scale	307	373	66	45.4	20.6
Different location and later date	95	103	8	8	0
Zero (Project abandoned)	16	55	39	39	0
Total:	961	1154	193	146.2	46.8

Source: Enterprise Ireland Impact Survey (2002)

Turning to those case study firms (n=17) who recorded a net decline in employment in the period under analysis we must utilise a different conceptual approach. For each of these firms the impact of EI financial assistance is calculated in the same way but, in the context of declining net overall employment, the counterfactual must be expressed in terms of jobs maintained or safeguarded. Accordingly, it is now possible to estimate that the number of jobs maintained or safeguarded over the period 2000/2001 to 2002 was 100.79 (i.e., 101 jobs). These jobs represent 6.7 per cent of the base employment (1,498 jobs) in these firms. However, for the purposes of creating an estimate of additionality the number of jobs maintained or safeguarded can be expressed as a percentage of the total net employment loss (222 jobs) within this group of firms (45.4%). In other words in the absence of EI financial assistance to these 17 firms the scale of job loss would have been more than twice as much again – that is, additionality is estimated as 45.4 per cent. Focusing only on those firms in this group who were in the partial deadweight category (i.e., excluding the two firms who would have gone ahead with the project anyway) the number of jobs maintained or safeguarded as a result of EI financial assistance remains the same (i.e., 101 jobs) but the total net employment loss falls to 211 jobs. Therefore, in this case additionality is estimated as 47.8 per cent.

In summary, therefore, the case study approach has resulted in four estimates of **additionality** for the impact of EI financial assistance:

- **53.1%** (deadweight = 46.9%) for those firms with a net increase/static employment change (pure and partial deadweight categories)
- **75.6%** (deadweight = 24.4%) or those firms with a net increase/static employment change (partial deadweight categories only)
- **45.4%** (deadweight = 54.6%) for those firms with a net decline in employment (pure and partial deadweight categories)
- **47.8%** (deadweight = 52.2%) for those firms with a net decline in employment (partial deadweight categories only)

Another way of aggregating these results is to return to the self-assessment categories of deadweight presented above in Table 1. Using the above estimates of deadweight/additionality for the partial deadweight categories (i.e., 24.4% and 52.2%

deadweight) we can now construct a simplified overall estimate of deadweight based on the proportion of firms in each category (Table 5). The final column presents the results of this exercise and was calculated as follows. First, 19 per cent of the case study firms can be attributed a deadweight estimate of 100 per cent as they would have gone ahead with the project regardless of EI financial assistance. Second, 73.8 per cent of the firms were categorised as recording partial deadweight and these can be split into a further two groups: those with a net increase or no change in employment (42.8%) and those who had a net employment decline (31%). Using the partial deadweight estimates of 24.4 and 52.2 per cent for these two groups (derived from the two approaches outlined above), and multiplying by the proportion of firms in each group, this results in estimates of partial deadweight of 10.5 and 16.7 per cent respectively. Third, those firms who indicated that they would have completely abandoned the project in the absence of EI financial assistance were attributed a deadweight estimate of 0 per cent.

Table 5 Deadweight Categories and Estimates			
Deadweight Category	Percentage of Firms (No. of firms)	Deadweight Estimate	Weighted Deadweight Estimate
Pure (100%) deadweight	19% (8)	100%	19.0%
Partial deadweight (different location)	0% (0)	24.4% (increase/static) n=18	10.5%
Partial deadweight (later date)	7.1% (3)		
Partial deadweight (reduced scale)	35.7% (15)		
Partial deadweight (later date and reduced scale)	28.6% (12)	52.2% (decline) n=13	16.7%
Partial deadweight (different location and later date)	2.4% (1)		
Zero deadweight	7.1% (3)	0%	0%
Overall Estimate of Deadweight			46.2%

Source: Enterprise Ireland Impact Survey (2002)

Summing these four weighted deadweight estimates we arrive at an overall deadweight estimate of 46.2% (i.e., additionality of 53.8%) for the impact of EI financial assistance on the 42 case study firms. This lies within the range of additionality estimates presented above (45.4% to 75.6%) which are based solely on our methodology of calculating a counterfactual at the individual firm.

We must also bear in mind that, as was established above, the firms included in the survey were drawn from a population of EI clients which represent just over two-thirds of EI expenditure in the period chosen for this study.

4.3 A Framework for Estimating Displacement

4.3.1 An Overall Estimate

The second element in the calculation of the additionality of Enterprise Ireland assistance is displacement. The questions adopted in the case study interviews to capture an estimate of displacement have already been outlined earlier in the paper. Following on from these questions it can be seen that in the current study on average 36.2 per cent of the survey firms' sales were sold nationally. The remainder of sales were thus sold internationally.

Table 6 shows (a) the percentage of the survey firms' sales which are sold nationally, and (b) the percentage of sales by the survey firms which compete mainly with other firms nationally. Both (a) and (b) are used to calculate displacement nationally (i.e. the displacement associated with EI intervention in Ireland). One would assume, therefore, that where there is a strong tendency towards export markets, regarding sales and competitors, that displacement would be lower. Table 6 uses information regarding (a) and (b) to derive an estimate for displacement associated with EI financial assistance over the study period.

From Table 6 one can see that 36.2 per cent of firms' sales were sold nationally (the remainder were sold internationally). 22.3 per cent of sales, by survey firms, competed mainly with other firms nationally (i.e. import substitution thus occurred in 77.7% of sales). Bringing these two figures together an estimate for displacement of 8.1 per cent is derived

(that is, 36.2% of 22.3%). From this it can be concluded that 8.1 per cent of sales from EI assisted firms displaces output and jobs from other Irish firms. The remainder of this section provides some disaggregated estimates of displacement within the sample of case study firms. Although this level of disaggregation was not undertaken for the deadweight estimates due to the potential increased error term associated with even smaller numbers of respondents on self-assessment questions, we do this with some confidence for displacement due to the more factual nature of the information demanded from the owner-manager.

Table 6: Towards an Estimate for Displacement	
% of firms' sales sold nationally ^(a)	% of sales by survey firms which compete mainly with other firms nationally^(b)
36.2	22.3
The assumption is that the remainder of sales are either sold internationally or import substitution ⁴ thus occurs in 77.7% of sales	

Source: Enterprise Ireland Impact Survey (2002)

4.3.2 *HPSUs versus Expansions*

Bearing in mind that 12 of the 42 firms in the sample are HPSUs with the remaining 30 firms Expansions, this section provides a comparative analysis of displacement estimates between the two sets of firms. The *a priori* reasoning here is that displacement will be lower for HPSUs on the grounds that they were assisted by EI primarily on the strength of their export potential. Table 7 provides a summary of displacement estimates for HPSUs compared to Expansions.

From Table 7 one can see that, in the case of HPSUs, 29.8 per cent of firms' sales were sold nationally (the remainder were sold internationally). It has been estimated from information provided by the survey firms that 17 per cent of sales by HPSUs competed mainly with other

firms nationally (i.e. import substitution thus occurred in 83.0% of sales). In the case of the Expansions in the sample, 38.8 per cent of firms' sales were sold nationally (the remainder were sold internationally). 24.5 per cent of sales by Expansions competed mainly with other firms nationally (i.e. import substitution thus occurred in 75.5% of sales).

Table 7: Displacement Estimates: HPSUs versus Expansions			
	% of firms' sales sold nationally^(a)	% of survey firms who compete mainly with other firms nationally^(b)	Displacement Estimate^(c)
<i>HPSUs</i>	29.8	17.0	5.1
<i>Expansions</i>	38.8	24.5	9.5

(a) The assumption is that the remainder are sold internationally.
 (b) Import substitution thus occurs in 83.0 per cent of sales for HPSUs and 75.5% of sales for Expansions. Import substitution in this sense implies that EI assisted firms replace imports (international) with domestic (national) production.
 (c) Bringing the figure for the percentage of firms' sales sold nationally together with the figure for the percentage of survey firms who compete mainly with other firms nationally allows us to calculate an overall estimate of displacement. For example, in the case of HPSUs (29.8% of 17.0%) = a displacement estimate of 5.1%. In the case of Expansions 38.8% of 24.5% = a displacement estimate of 9.5%.

Source: Enterprise Ireland Impact Survey (2002)

Bringing these figures together, an estimate for displacement of 5.1 per cent (i.e. 29.8% of 17%) is derived in the case of the HPSU firms in the sample. From this it can be concluded that 5.1 per cent of sales from EI assisted HPSU firms displaces output and jobs from other national firms. The corresponding displacement figure in the case of the expansion firms in the sample is 9.5 per cent (i.e. 38.8% of 24.5%). This confirms the *a priori* reasoning set out above, where one might anticipate that firms receiving assistance for expansion purposes are more likely to cause displacement given that over time they are more likely to have penetrated the market and competed more vigorously than HPSUs which are new to the market and therefore likely to have less immediate impact in terms of displacement. One might also expect that a certain time lag effect is in place regarding the impact of

⁴ Import substitution in this sense implies that Enterprise Ireland assisted firms replace imports with

displacement. Many of the HPSUs in the sample are also in new niche highly specialised hi-tech markets such as computer and related activities. Such firms are therefore in all probability less likely to cause displacement than already existing firms who received assistance from EI and who are operating in more traditional sectors of the economy such as food and clothing. To further test this hypothesis, the section which follows examines the impact of displacement in the case of hi-tech firms in computer and related service activities to the other firms in the sample, which to a large extent comprise manufacturing/production firms in the more traditional sectors of food and clothing.

4.3.3 Sectoral Comparisons

From Table 8 one can see that in the case of the Hi-Tech firms⁵ in the sample (n=19), 26.7 per cent of firms' sales were sold nationally (the remainder were sold internationally). In the case of Hi-Tech firms 16.5 per cent of their sales competed mainly with other firms nationally (i.e. import substitution thus occurred in 83.5% of sales). In the case of the more traditional firms⁶ in the sample (n=23), 44.1 per cent of firms' sales were sold nationally (the remainder were sold internationally). For these more traditional firms it was ascertained that 27.6 per cent of their sales competed mainly with other firms nationally (i.e. import substitution thus occurred in 72.4% of sales).

Bringing the figures together, an estimate for displacement of 4.4 per cent (i.e. 26.7% of 16.5%) is derived in the case of the Hi-Tech firms in the sample. From this it can be concluded that 4.4 per cent of sales from EI assisted Hi-Tech service firms displaces output and jobs from other national firms. The corresponding displacement figure in the case of the more traditional firms in the sample is 12.2 per cent (i.e. 44.1% of 27.6%). Therefore, as anticipated in the previous section, the Hi-Tech firms in the sample, due to a combination of the niche markets (e.g. internet services, telematics, mobile payment platform etc) in which they operate combined with the high percentage of international sales and the international location of their competitors, are less likely to cause displacement than their counterparts in more traditional sectors of the Irish economy such as food, clothing, ceramic and wood.

domestic (national production).

⁵ For the purposes of this study this was defined as computer and related service activities.

Table 8: Displacement Estimates: A Sectoral Comparison			
	% of firms' sales sold nationally^(a)	% of survey firms who compete mainly with other firms nationally^(b)	Displacement Estimate^(c)
<i>Hi-Tech firms</i>	26.7	16.5	4.4
<i>Traditional firms</i>	44.1	27.6	12.2
<p>^(a) The assumption is that the remainder are sold internationally.</p> <p>^(b) Import substitution thus occurs in 83.5% of sales in Hi-tech firms and 72.4% of sales in traditional firms. Import substitution in this sense implies that EI assisted firms replace imports (international) with domestic (national) production.</p> <p>^(c) Bringing the figure for the percentage of firms' sales sold nationally together with the figure for the percentage of survey firms who compete mainly with other firms nationally results in an overall estimate of displacement. In the case of Hi-Tech firms (26.7% of 16.5%) = a displacement estimate of 4.4%. In the case of traditional firms 44.1% of 27.6% = a displacement estimate of 12.2%.</p>			

Source: Enterprise Ireland Impact Survey (2002)

4.3.4 Size Comparisons

On *a priori* grounds, one would expect that size of firm⁷ would influence displacement. On the one hand, one might expect that small firms, employing less than 50 persons, are more likely to cause displacement given that small firms are generally more likely to sell their products nationally rather than to export, implying that displacement is likely to be higher. Hart and Scott (1994) found this in their study which assessed the contribution of selective financial assistance to small firms in terms of employment creation in Northern Ireland over the period 1986-90. They found that displacement is a greater problem with very small firms. The counter argument is also plausible. Larger firms (employing more than 50 persons) may be more likely to cause displacement in the sense that they may have a larger

⁶ Defined as manufacturing/production firms in the more traditional sectors of the economy such as food and clothing.

⁷ Size in this case is measured in terms of employment reported by firms during face-to-face interviews relating to the year 2002.

degree of market power (especially at local/regional and national levels) and may penetrate the market to the degree that they may end up displacing the output/employment of already existing firms due to their market impact. Tervo (1990) in his study which examined Finnish regional incentive policy using survey data on assisted firms found that firm size was one of the firm characteristics to impact on displacement. More precisely, he found that large firms were more likely to cause displacement effects.

In Table 9, the displacement estimates in the case of small versus large firms in the sample are presented. In the case of the small firms in the sample (n=24), 33.8 per cent of their sales were sold nationally (the remainder were sold internationally). It was further established that 18.5 per cent of sales by small firms competed mainly with other firms nationally (i.e. import substitution thus occurred in 81.5% of sales). In the case of the large firms in the sample (n=18), 39.4 per cent of their sales were sold nationally (the remainder were sold internationally). It was further calculated that 27.7 per cent of sales, by large survey firms, competed mainly with other firms nationally (i.e. import substitution thus occurred in 72.3% of sales).

Bringing the figures together, an estimate for displacement of 6.4% per cent (i.e. 33.8% of 18.5%) is derived in the case of the small firms in the sample. From this it can be concluded that 6.4 per cent of sales from EI assisted small firms displaces output and jobs from other national firms. The corresponding displacement estimate for large firms in the sample is 10.9 per cent (i.e. 39.4% of 27.7%).

Table 9: Displacement Estimates: Small versus Large firms			
	% of firms' sales sold nationally^(a)	% of survey firms who compete mainly with other firms nationally^(b)	Displacement Estimate^(c)
<i>Small Firms</i>	33.8	18.5	6.4
<i>Large firms</i>	39.4	27.7	10.9

(a) The assumption is that the remainder are sold internationally.
 (b) Import substitution thus occurs in 81.5% of sales (small firms) and 72.3% of sales (large firms). Import substitution in this sense implies that EI assisted firms replace imports (international) with domestic (national) production.
 (c) Bringing the figure for the percentage of firms' sales sold nationally together with the figure for the percentage of survey firms who compete mainly with other firms nationally results in the overall displacement estimate. In the case of small firms (33.8% of 18.5%) = a displacement estimate of 6.4%. the case of large firms 39.4% of 27.7% = a displacement estimate of 10.9%.

Source: Enterprise Ireland Impact Survey (2002)

4.3.5 Summary on Displacement

The evidence in this section points to an estimate of displacement associated with EI financial assistance lying within the range 4.4 to 12.2 per cent. The estimates towards the lower end of the range are associated with HPSUs, Hi-Tech firms and small firms while the higher estimates are found within larger firms, Expansions and more traditional activities. The overall estimate of displacement for the 42 firms in the sample is **8.1 per cent**

4.4 Towards an Estimate of Additionality

Using the above estimates of deadweight and displacement it is possible to arrive at some overall sense of the net additionality of EI assistance to Irish industry in the period under review. The summary estimate of deadweight presented in Table 5 was 46.2 per cent and

combining this with the overall displacement estimate of 8.1 per cent we arrive at an estimate of net additionality of EI assistance in terms of employment for the sample firms.

From Table 2 the net employment change for the 42 case study firms was 53 jobs in the period 2000/2001 to 2002. Therefore, net employment change discounting deadweight (46.2%) and displacement (8.1%) can be calculated as 26.2 jobs which gives an overall estimate of net additionality of 49.4 per cent.

5. Conclusion

There is no one best methodological approach to estimating the net additionality of public assistance to industry. The approaches range from control group analysis using panels of assisted and non-assisted firms, cost-benefit analysis, shift-share techniques and self-assessment interview techniques all designed to build robust counter-factual scenarios. Each approach should be evaluated on a case-by-case basis due to the fact that each has its merits and demerits in different circumstances. As Turok (1991) outlined, *"Each approach is confronted by acknowledged technical and practical difficulties"* (p. 1547). This paper has concentrated on the self-assessment approach using face-to-face interviews with the owner-managers of assisted firms and has provided an innovative method (building on the earlier work of Lenihan, 1999 and 2001) to enable the dimensions of partial deadweight to be incorporated into the overall estimate of deadweight. Although specific estimates have been presented which gives an overall assessment of 50 per cent net additionality for EI assistance it must be remembered that these estimates relate only to one specific year and to a sample of only 42 firms. Nevertheless, what is important is the methodological approach adopted in the paper rather than the results themselves. Our approach has provided a rigorous, structured, but at the same time user-friendly approach to evaluating the effects of financial assistance to individual firms.

One of the inherent difficulties of applying this methodology in the context of EI financial assistance to industry is the fact that a large proportion of that assistance was in the form of preference shares (see Figure 1) which are repayable to EI. To develop estimates of deadweight which are effectively more suited to the concept of a non-repayable grant regime are problematic and have not been addressed in this paper. For that reason, it has not been possible to develop a comparative dimension to this study because most comparator studies

are more accurately developing estimates of "grant deadweight" which is not what is being measured here.

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