

# Evaluation of Enterprise Ireland Lean Business Offer 2009-2012

April 2015



**Department of Jobs, Enterprise and Innovation**  
**An Roinn Post, Fiontar agus Nuálaíochta**

*Strategic Policy Division*

## 10. Enterprise Ireland Lean Business Offer 2009-2012

### Programme logic model

#### Objectives

- Encourage clients to adopt Lean business principles in their organisation to increase competitiveness (via improvements in productivity)



#### Inputs

- Direct grants to companies
- Indirect costs
- Company inputs



#### Activities

##### Lean Start

- Training of company staff in Lean principles and techniques
- Short in-company Lean assignment - typically 8 weeks

##### Lean Plus

- In-company medium scale business process improvement project - typically less than 6 months
- Training/ team building activities for company staff assigned to Lean project
- Assign LeanPlus Champion(s)

##### Lean Transform

- Extensive holistic company transformation programme
- No. of Lean Start/ Plus / Transform projects started



#### Outputs

- Successfully complete LBO projects
- Improved staff capabilities in Lean
- Productivity improvements achieved
- On-going senior management commitment to Lean principles



#### Outcomes and Impacts

- Business outcomes (participating companies)
- Improved productivity (more widely)
- Increased competitiveness
- Establishment of continuous improvement programme / Lean culture

## Evaluation aim

The Lean Business Offer (LBO) has been in place since 2009 and this *interim evaluation* covers the period 2009-2012. The evaluation was conducted between July and November 2013.

The aim of the evaluation is to assess the appropriateness, efficiency, and effectiveness of the Enterprise Ireland Lean Business Offer. Technopolis consultants were commissioned by Forfás to undertake research and analysis for this evaluation.

## Programme background, objectives and target population

The LBO is designed to encourage companies to adopt Lean business principles to increase competitiveness. The basic principle of the LBO is to develop a sustainable competitive advantage leading to a significant increase in profitable sales, exports and employment.

The LBO is made up of three interventions of increasing scale and complexity that can be undertaken sequentially or individually depending on the needs, skills and experience of the company in question.

The LBO provides Enterprise Ireland's client companies with access to expert consultants and is intended to help:

- Identify issues and potential improvement areas in a business;
- Provide support to implement change; and to
- Achieve savings and improvements in capacity and capabilities to deliver.

Furthermore it is intended that a culture of continuous improvement is developed and embedded in order that companies continue to be internationally competitive into the future.

The three interventions are described in brief in Table 10.1.

**Table 10.1: Overview of the intervention evaluated**

Programme	Activities	Objectives / intended outcomes
Lean Start	<ul style="list-style-type: none"> <li>▪ Short in-company consultancy project</li> <li>▪ 7 days input from expert consultant, up to €6,300 in cost (€5,000 (80 percent) funded by Enterprise Ireland)</li> <li>▪ Complete a specific cost reduction project (up to 8 weeks)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Cost reductions achieved/demonstrated in pilot project</li> <li>▪ Introduce Lean skills as foundation for future Lean activities/ projects</li> </ul>
Lean Plus	<ul style="list-style-type: none"> <li>▪ Medium scale business improvement project with external expert consultant (not less than 6 months in duration)</li> <li>▪ Up to €70,000 (50 percent funded by Enterprise Ireland)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Significant productivity improvements in project conducted</li> <li>▪ Embedding of culture of continuous improvement</li> <li>▪ Cohort of trained staff</li> <li>▪ Longer-term plan to pursue company wide improvement</li> </ul>
Lean Transform	<ul style="list-style-type: none"> <li>▪ Extensive holistic programme with an external consultant(s) to enact change and embed culture of continuous improvement</li> <li>▪ Projects expected to cost of order of €100,000 (with the level of Enterprise Ireland support decided on a case by case basis)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Company-wide transformation in culture and performance</li> <li>▪ Considerable productivity and business performance targets achieved</li> <li>▪ Sustainable continuous improvement culture programme established</li> </ul>

Source: Enterprise Ireland

All Enterprise Ireland client companies are eligible for the LBO with the exception of HPSUs. Enterprise Ireland clients have to fulfil two criteria:

- Be a small or medium enterprise (SME) as defined by the European Commission; and
- Be a manufacturing or an internationally trading services company.

The LBO does not target any particular sub-set of businesses. The intervention is dependent upon an individual company’s capability in using Lean principles, the company size and its particular business development needs.

Grant assistance is available towards the cost of consultant / trainer fees at rates agreed by Enterprise Ireland. The Lean Transform business offer provides the companies the option to seek support for a project manager.

## Modus operandi

In order to access LBO support, Enterprise Ireland client companies discuss their need with their Development Advisor, agree the level of support required (Lean Start, Plus or Transform) and develop and submit a grant application to Enterprise Ireland. Typically companies select the Lean consultant before the application is made to Enterprise Ireland. Only Enterprise Ireland approved consultants may be appointed. Enterprise Ireland provides companies with a list of suitable consultants and advises them to conduct a selection process to identify the consultant who best meets their needs.

Applications for Lean Start and Plus projects are approved by the Lean Desk at Enterprise Ireland while the substantially larger Lean Transform projects are approved by the Enterprise Ireland Investment Committee.

The Lean Unit at Enterprise Ireland has developed well-defined guidelines for the three interventions to ensure that the companies and the consultants understand what is required and what types of outputs can be expected.

## Programme rationale

The underpinning economic rationale for business support of the type offered by the LBO does not neatly fall within the neo-classical economics approach to market failures but instead aligns with the concept of 'capability failures' in the innovation systems literature. Capability failures are linked to the view of the firm as a 'learning organisation' and are defined as "inadequacies in companies' ability to act in their own best interests, for example through managerial deficits, lack of technological understanding, learning ability or absorptive capacity to make use of externally generated technology".<sup>1</sup> While the innovation systems literature generally focuses on technology-based innovation it can also apply to managerial and organisational innovations such as Lean. A lack of capabilities in terms of competences and resources can restrict a company's ability to learn, adapt and be innovative.<sup>2</sup>

The basic premise of the LBO is that the application of Lean principles develops a sustainable competitive advantage leading to a significant increase in profitable sales, exports and employment. Lean principles are based on building the capability and capacity in people and processes.

From a programme logic model (PLM) perspective, the application of Lean principles increases process efficiency leading to reduced production costs and/or increased process capacity. These in turn lead to more competitive pricing and/or improved product and service quality that lead to impact in the form of sales growth, ideally in the form of exports to avoid simple displacement of activity within the domestic market. In the short term, productivity improvements might lead to a reduction in jobs or the delivery of increased sales for the same number of jobs. However, the intention of the programme is that export growth will lead, in the longer-term, to employment

---

<sup>1</sup> Arnold, E., Thuriaux, B., *Developing Firms' Technological Capabilities*, Technopolis, 1997. The concept of capability failures is also defined by others such as Edquist, C., Chaminade, C., *From theory to practice: the use of systems of innovation approach in innovation policy*, CIRCLE Electronic Working Papers, CIRCLE, Centre for Innovation, Research and Competences in the Learning Economy, Lund University

<sup>2</sup> Some authors argue that capability failures are not a form of system failure as such but are an unavoidable effect of bounded rationality

## EVALUATION OF BUSINESS DEVELOPMENT PROGRAMMES

growth. Furthermore, in highly competitive markets and in recessions the impact may well be in the form of protecting or retaining sales and market share and sustaining existing jobs.

The hierarchy of objectives and the programme description was used to construct a PLM and set of metrics for LBO. These are presented in Table 10.2 and 10.3. The PLM guided the evaluation in that the key metrics identified guided the data collection methods and provided the key data for the evaluation analysis.

**Table 10.2: How Enterprise Ireland’s LBO fits with Ireland’s policy objectives**

<b>HIERARCHY OF OBJECTIVES</b>				
<b>NDP (national level) 2007-2013</b>	<b>Enterprise, Science &amp; Innovation (NDP 2007-2013)</b>	<b>Indigenous Enterprise Sub-programme (NDP 2007-2013)</b>	<b>Enterprise Ireland Strategy 2005-2007 &amp; 2008-2013</b>	<b>Lean Business Offer Objectives 2009 - present</b>
Macroeconomic and budgetary stability Balanced regional development with regions achieving their full potential Addressing economic and social infrastructure deficits <b>Supporting enterprise, innovation and productivity</b> Supporting agriculture and the rural economy Promotion of Social inclusion All-island economic and sectoral co-operation Environmental sustainability Value for money in delivery	To improve the capacity of <b>indigenous industry to compete in the domestic and global marketplace by addressing key issues including productivity, management skills and the use of technology and marketing</b> <i>(This is one of 7 objectives, the one most relevant to indigenous enterprises and the Lean Programme)</i>	The focus of Enterprise Ireland’s overall strategy for the period of this Plan is to be to <b>maximise export sales</b> through the utilisation of applied research, technology and innovation while wishing to promote regionally balanced economic development	<b>2005-2007 &amp; 2008-2013 EI Mission</b> To accelerate the development of world-class Irish companies to achieve strong positions in global markets resulting in increased national and regional prosperity <b>2005-2007 EI Objectives</b> To help transform Irish companies into market-focused and innovation-driven businesses across all regions and sectors To increase their exports, sales and employment To develop a highly competitive, self-sufficient, world-class industrial structure <b>2008-2013 EI Overarching Objective</b> Increasing exports continues to be the overarching objective of Enterprise Ireland’s activities and remains the primary indicator of Ireland’s international success and competitiveness <b>2008-2013 EI Strategic Objectives &amp; Strategic Targets</b> Driving growth and internationalisation, increasing Irish innovation, growing companies of scale, growth and competitiveness in existing and emerging sectors Driving growth in services Entrepreneurship and regional development	EI’s LBO is designed to encourage clients to adopt Lean business principles in their organisation to increase competitiveness (via improvements in productivity)

Source: National Development Plan 2007-2013, Enterprise Ireland Strategies 2005-2007 & 2008-2013, Enterprise Ireland LBO brochure

**Table 10.3: Lean Business Offer: Programme Logic Model (PLM)**

LBO objective: to encourage clients to adopt Lean business principles in their organisation to increase competitiveness.

Inputs	Activities	Outputs	Outcomes	Impact
Support from EI business advisors Identification of suitable Lean consultant(s) Initial development of Lean project idea(s) EI funding Industry funding	<b>Lean Start</b> Training of company staff in Lean principles and techniques Short in-company Lean assignment - typically 8 weeks <b>Lean Plus</b> In-company medium scale business process improvement project - typically less than 6 months Training/ team building activities for company staff assigned to Lean project Assign LeanPlus Champion(s) <b>Lean Transform</b> Extensive holistic company transformation programme	Successfully complete LBO projects (Final reports received and final grant claims approved) Improved staff capabilities in Lean Productivity improvements achieved (as result of specific process improvement projects undertaken) On-going senior management commitment to Lean principles	Business outcomes Improved productivity (more widely) Increased competitiveness Establishment of continuous improvement programme / Lean culture	Business outcomes (participating companies) Improved business performance in terms of: <ul style="list-style-type: none"> <li>▪ Exports</li> <li>▪ Jobs</li> </ul>
Indicators				
Value of funding from: <ul style="list-style-type: none"> <li>▪ EI</li> <li>▪ Industry (cash and in-kind)</li> </ul>	No. of projects started No. of projects completed No. of consultants selected and deployed	No. of final reports available No. of staff trained in Lean Quantified productivity improvements No. of Lean Champions appointed	Business outcomes Productivity improvements (across the company) Increased competitiveness No. of companies implementing continuous improvement programmes / Lean cultures	Improved business performance Increased exports Increased jobs

### Evaluation methodology

The evaluation followed the approach specified in the Forfás document Framework for the Evaluation of Enterprise Supports (2011). The approach was based on the following five stages:

Step 1: Define evaluation objectives and describe the programme

Step 2: Identify appropriate methodology for analysis

Step 3: Identify data requirements

Step 4: Evaluate the programme

Step 5: Report and review the evaluation

Three main data sources of information were used in the evaluation, the Forfás Annual Employment Survey, the Enterprise Ireland client database and the Forfás Annual Business Survey of Economic Impact (ABSEI). Complete data is not available on all programme participants across each of the data sources. The overlap of the three main data sources led to a complete set of data for 285 companies that participated in LBO.

### Desk research

The evaluation started with a review of documentation provided by Enterprise Ireland and Forfás. This included:

- Enterprise Ireland Annual Reports (2005-2012);
- Enterprise Ireland Corporate Strategy (2005-2008 and 2008-2010);
- LBO documentation and website; and
- LBO database.

### Primary data sources: survey of participants

#### Population

In order to collect primary data on outputs and outcomes, and further data on impact and attribution, an online survey was conducted. 343 companies had a grant approved for the LBO between 2009 and 2012, and formed the population of companies considered by the evaluation.

16 companies were excluded from the survey as they were suggested by the Lean Unit and Enterprise Ireland as potential interviewees and case studies.<sup>3</sup> A further 16 were excluded that were also part of another evaluation underway at the same time.<sup>4</sup>

The survey was successfully delivered to 305 LBO participants. A total of 137 companies responded to the survey, amounting to a 44 percent response rate. This number of responses is sufficient to permit a reliable analysis of the survey findings that is representative of the overall population.

---

<sup>3</sup> A prior evaluation conducted by Technopolis of Enterprise Ireland's Internationalisation Support Programmes indicated that companies were reluctant to participate in interviews when they had also completed the survey

<sup>4</sup> 40 companies participated in both eBMI & Lean. After removing those invited for interviews the remaining 32 companies were assigned to each evaluation on a case-by-case basis to arrive to a final allocation of 17 companies for the LBO survey and 16 for the eBMI survey

### Sampling and sample bias

The presence of a selection bias for companies that responded to the survey on the LBO was tested with respect to the population of companies granted by LBO. There was no statistically significant difference between them in terms of employment, sales and exports. There was however a statistically significant difference in terms of export intensity. This may result in a slight overestimation of the positive effect of the programme.

### Survey questionnaire

The questionnaire contained five main sections:

- Objectives and outputs of participation;
- Outcomes and impacts of participation;
- Effects of the global economic downturn;
- Satisfaction with the programme; and
- The economic downturn.

### Quantitative evidence: methods used to test causal relationships

#### The counterfactual

In order to identify a causal relationship between inputs and activities of the LBO and its final impacts a counterfactual analysis was conducted. The counterfactual analysis enables the *additionality* of the programme to be explored i.e. the extent to which any measurable change can be attributed to participation in the programme.

The main challenge when testing causal relationships is to find an appropriate control group, i.e. a group of companies that have not participated in the programme being evaluated but that have similar characteristics to the participant companies (before their participation).

A control group for the evaluation was constructed using the information available in the ABSEI data on the entire Enterprise Ireland client base. To create a group of comparable companies a technique called *propensity score matching* was used (see the Evaluations [Technical Annex](#) for further detail). The *propensity score matching* for the LBO evaluation was based on the following firm characteristics:

- Age of the company;
- Value of exports;
- Exports intensity (exports as percentage of total sales);
- Productivity (sales per employee); and
- Sales.

#### Other methods used

In addition to the counterfactual analysis, which is the final step taken to measure impact, other quantitative methods were also used, including:

- **Composition analysis (for outputs and outcomes)** - a composition analysis shows basic statistics on distribution of results across different categories.
- **A trend analysis of performance indicators** - the analysis of time-series shows how companies' performance has changed over time and also if there was an identifiable trend in this performance before the programmes started.
- **Univariate analysis of change in performance indicators** - changes in performance indicators before and after companies' participation and test whether those differences are statistically significant. The beginning of participation is defined as the first year in which a grant is approved to each firm. This means that the period and duration of participation is unique to each company.

**Qualitative evidence: interviews and case studies**

**Interviews with client companies**

A programme of 12 semi-structured interviews was conducted with programme participants and stakeholders. The main objectives of these interviews are shown in Table 10.4.

**Table 10.4: Programme of interviews - objectives**

Stakeholder	Objectives
Companies (8)	<p>Understand the impact of LBO on companies' skills and business performance and the mechanisms through which these benefits are materialised</p> <p>Gather company views on what are (were) major areas for improvement</p> <p>Explore the potential synergies between the different Enterprise Ireland's business support programmes</p>
Development Advisors (DAs) (2)	<p>Understand how companies get in contact with (or were contacted by) Enterprise Ireland</p> <p>Understand how DAs make the decision to allocate companies to the different Business Support Programmes</p> <p>Gather DA views on what are the main benefits of the programme and what are (were) major areas for improvement</p> <p>Explore the potential synergies between the different Enterprise Ireland's business support programmes</p>
Consultants (2)	<p>Understand how consultants interact with companies</p> <p>Understand how the support works in practice</p>

Based on the information obtained from the programme of interviews and additional desk research, two short case studies have been prepared that describe how the programme operates and how impacts and benefits are realised.

## Quantitative evidence: metrics used to measure the programme success

The metrics identified in the programme logic model guided the evaluation. As this is an interim evaluation the analysis has focused on outcomes in terms of productivity rather than on impacts in terms of exports as, in most cases, it is too soon for productivity improvements to have resulted in increased exports.

See Appendix I and [Technical Annex](#) for further detail on data sources and methodology.

## Alignment with national policy

Since the 2008 economic downturn, the National Development Plan has more explicitly increased its focus on employment in addition to export-led growth in order to counter the adverse effects of the downturn on employment. The LBO's focus on productivity improvements to support competitiveness and ultimately sales and exports is directly aligned with the export goals of Enterprise Ireland and the NDP. It is also aligned to the Forfás 'Making it Happen' report which sets out the actions needed to ensure a competitive, sustainable enterprise base that will deliver growth and jobs within the medium-term to 2015.<sup>5</sup>

It might appear that a productivity programme would reduce employment, at least in the first instance. This is not necessarily the case as the Lean approach specifically focuses on value-added and not simply on cost reductions and results in capacity increases instead of, or in addition to, cost reductions. This leaves companies with the ability to drive increased sales and exports for the same fixed costs and the subsequent growth of Irish jobs. Moreover the programme is intended to embed a new approach and set of skills in companies and stimulate culture change such that businesses become more competitive and outward looking and continue to positively contribute to the Irish economy. Therefore, the LBO is strongly aligned with national policies including the Action Plan for Jobs and the mandates of the enterprise agencies which place a significant focus on the retention as well as growth of employment.

## Inputs

### Direct costs

#### Enterprise Ireland grants to participating companies

During the period of the evaluation (2009-2012), 403 grants have been approved to 343 companies under the LBO programme for a total commitment of €14.04 million (Table 10.5 and 10.6). This represents just under 3 percent of Enterprise Ireland's total grant commitment for the same time period. The majority of the grant has yet to be drawn down by companies, with just under 45 percent (€6.3 million) of the total commitment already paid to grant recipients to date.

Uptake of the programme has improved year on year as awareness and participation increased (Table 10.5). Furthermore it is expected that many companies will progress through the stages of the programme from Lean Start to Lean Plus and on to Lean Transform.

The majority of grants approved (70.2 percent) have been for Lean Start (Table 10.6). A further 20.3 percent are Lean Plus and 9.4 percent are Lean Transform. However, the design of the programme is such that the majority of total approvals relates to Lean Transform grants (75.8 percent). Table 10.7 shows the grants approved for Lean Start match their intended design while

---

<sup>5</sup> Forfás, Making it Happen - Growing Enterprise for Ireland, 2010

Lean Plus are, on average, a little smaller the maximum allowed (at €35,000) and Lean Transform projects are of significant scale with an average Enterprise Ireland grant of €280,000 per project.

The average value of grants increases per year as more of the larger Lean Plus and Transform projects are applied for and approved. The drawdown rate decreases with time as most of the more recently approved projects are still underway and more of them are the larger and longer timeframe projects.

**Table 10.5: LBO grants and costs to date**

Year	Total no. of grants	Total value of grants approved (€)	Total value of grants paid (to date) (€)	Average value of grants approved per company (€)	Drawdown rate
2009	23	1,207,000	1,186,291	57,476	98%
2010	74	1,670,649	1,161,110	24,935	70%
2011	159	6,601,471	3,057,030	43,147	46%
2012	147	4,563,184	897,152	31,910	20%
Total	403	14,042,304	6,301,583	40,940	45%

Source: Enterprise Ireland grants database

**Table 10.6: Projects and grants**

LBO stage	No. of projects	No. of projects (percent)	Total grant value (€ Million)	Total grant value (percent)
Start	283	70.2%	1.392	9.9%
Plus	82	20.3%	1.995	14.2%
Transform	38	9.4%	10.654	75.9%
Total	403	100%	14.042	100%

Source: Enterprise Ireland grants database

**Table 10.7: Average grant value**

LBO stage	Average grant value €	Grant value as specified in Enterprise Ireland programme documentation €
Start	5,000	5,000
Plus	24,000	Up to 35,000 (up to 50% EI contribution to a project of up to €70,000)
Transform	280,000	Typically over 100,000

Source: Enterprise Ireland grants database

### Indirect costs

Indirect costs have been estimated based on the number of full-time equivalents (FTEs) working on the LBO programme for the years 2009-2012, and amount to €1.071 million for the period.

Bringing the estimated indirect costs and estimated company investment together with Lean grants approvals data results in a combined (estimated) programme expenditure of €59.7 million (Table 10.8), with just under two-thirds coming from the participating companies.

**Table 10.8: Estimated total expenditure including company contribution**

	Cost (2009-2012)	Cost (%) (2009-2012)
LBO grants approved	€14.04M	23.5%
Enterprise Ireland indirect costs ( <i>estimated</i> )	€1.07M	1.8%
Company contributions ( <i>estimated</i> )	€44.6M	74.6%
Total	€59.71M	100%

Source: Technopolis

## Outputs and activities

### Introduction: delivery of the programme

The LBO is made up of three business support offerings of increasing scale: Lean Start, Lean Plus and Lean Transform.

Grant assistance is available towards the cost of the consultant/trainer fees. The salary of an in-company project manager is also considered. Lean Plus and Lean transform also covers the costs of company in-house staff that have been allocated a key responsibility for the implementation of Lean and continuous improvement processes.

Lean Start projects involve a short project to introduce the Lean approach and Lean principles by training a group of staff and by deploying the approach (with close support from the expert consultant) on a specific process within the company. This enables the implementation of skills acquired through 'learning-by-doing' and also demonstrates to management and staff that Lean delivers tangible results.

Lean Plus projects are typically (but not always) undertaken after Lean Start and involve a wider engagement with company staff during a more significant process improvement project or projects. It is intended to leave a significant cohort of trained staff with Lean skills, to start to embed the continuous improvement culture (typically assigning a Lean Champion within the company) and to achieve considerable productivity improvements.

Lean Transform aims to take a company through company-wide transformation in culture and performance, fully embedding a sustainable culture of continuous improvement, achieving significant productivity and business performance improvements (sales growth, employment, etc.). Lean Transform projects are designed on a case-by-case basis and therefore there is no one-size-fits-all approach to their delivery.

Proposals to LBO can be initiated by companies themselves or in response to a recommendation from their Enterprise Ireland development advisor (DA).

Since clients have an existing relationship with their Enterprise Ireland DA, it is fairly routine for them to approach their DA when seeking to invest in any type of growth or business improvement activities. Companies are expected to have a 2-3 year forward-looking development plan towards which Enterprise Ireland can provide an appropriate package of support.

In most cases companies select their Lean consultant during the development of their application to Enterprise Ireland. This ensures that there is expert input to the project design from the outset.

The consultants are selected from a directory managed and maintained by Enterprise Ireland. While the list is not intended to be, nor is, a list of 'pre-approved' or accredited suppliers it is treated as a trustworthy source. Companies are advised to speak with or interview several consultants to identify the one most appropriate to their needs. The interviews would suggest that this type of selection process is followed.

### Activity measures for the programme

#### Number and value of grants

403 grants to a total value of €14.04 million have been approved for 343 companies across the three LBO stages. This implies that some companies had more than one grant approved. Figure 10.1 shows the number of grants awarded per year. The number of grants approved increased significantly in 2011 and 2012, as did the value of funds committed to the projects (Figure 10.2).

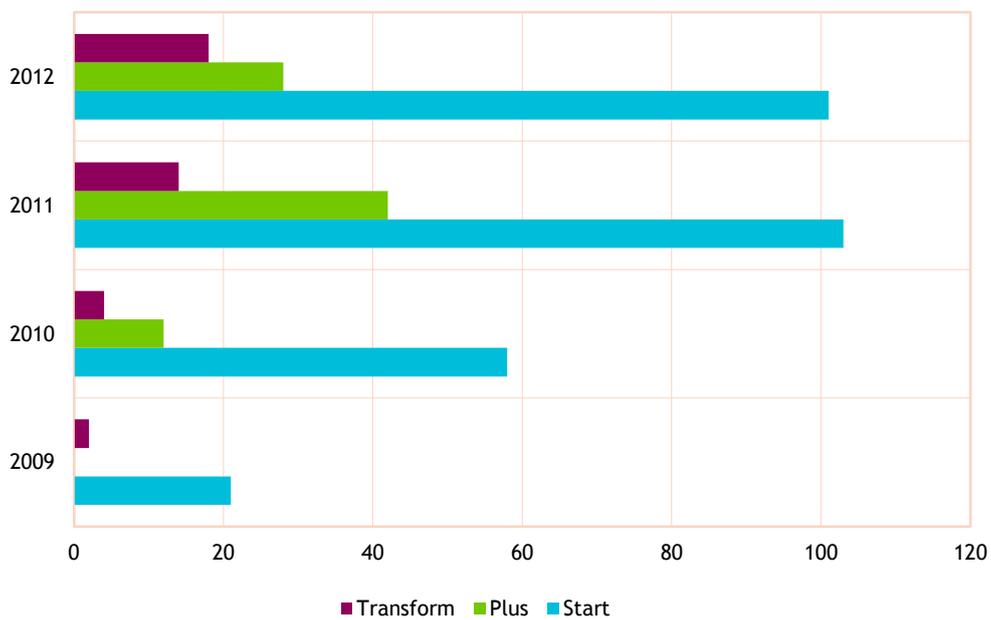
In terms of measureable activity undertaken to date, the drawdown rates of the Lean Start programme was around 90 percent in 2009 and 2010, which is much higher than the rate estimated for total Enterprise Ireland support in those years of around 75 percent. This suggests that Lean Start is a popular and relatively easy to implement form of support for companies.

The drawdown rate for Lean Plus projects in 2010 was 80 percent. Companies have two years to draw down funds and it is possible that some projects have been delayed. Drawdown rates for 2011 and 2012 are less relevant as projects may still be underway. However the Lean Unit database shows, for projects commencing in 2011 and 2012, that approximately three-quarters of Lean Start projects and half of Lean Plus projects were completed, while no Lean Transform

projects were started and completed in that time period.<sup>6</sup> Lean Transform projects are much more substantial investments on both the part of the company and Enterprise Ireland, and therefore take longer to develop, gain approval and implement.

In terms of funding levels 45 percent (€6.3 million) of the total value of approved grants has been drawn down. This can be accounted for by the fact that large sums were committed in 2011 and 2012 to the larger Lean Plus and very large Lean Transform projects many of which are still underway or still in their early stages. It is expected that the majority of this funding will be drawn down in future.

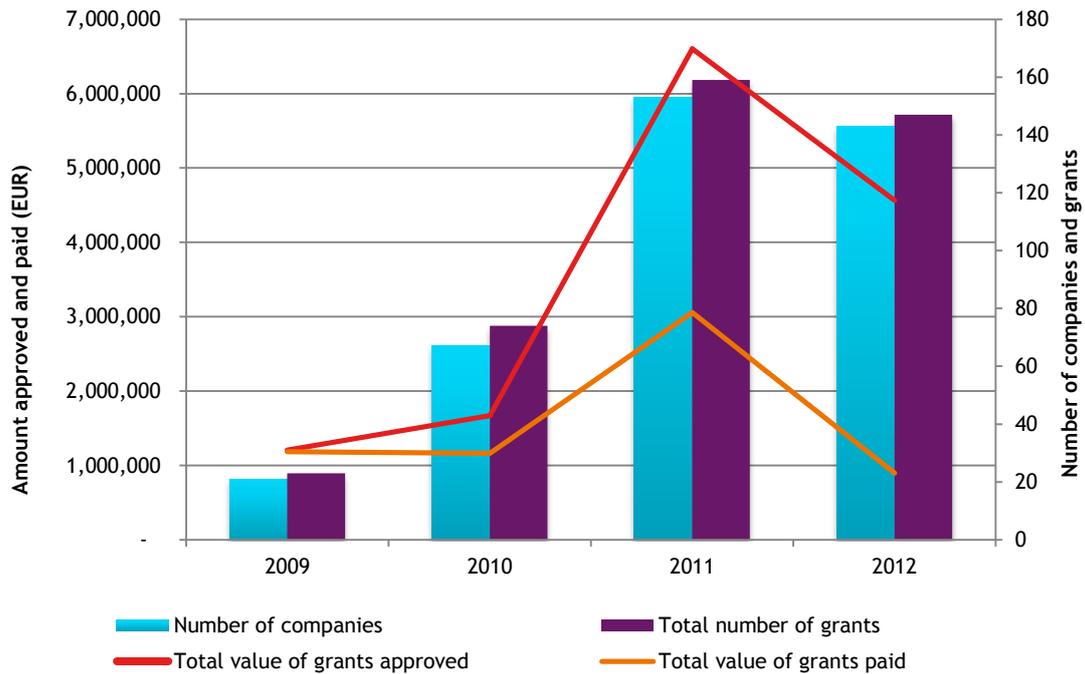
**Figure 10.1: Number of LBO grants awarded per year**



Source: Enterprise Ireland grants database

<sup>6</sup> For this purpose 'completed' is defined as having delivered their final report to Enterprise Ireland (but not necessarily having had received their final grant payment)

Figure 10.2: LBO grants and costs to date



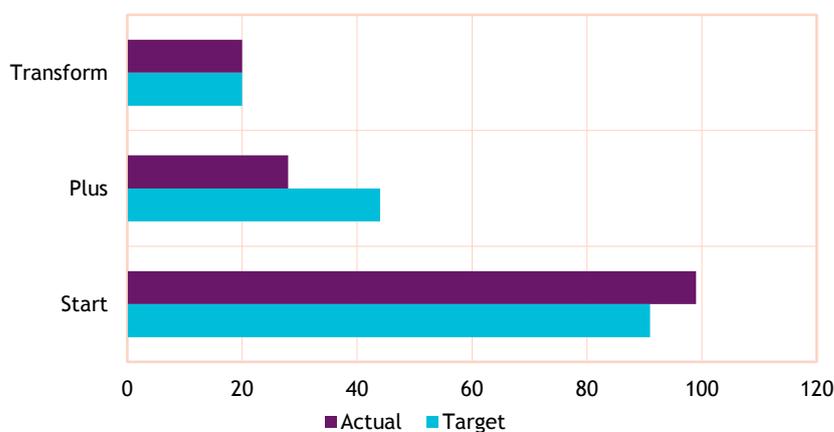
Source: EI grants database

**Programme targets**

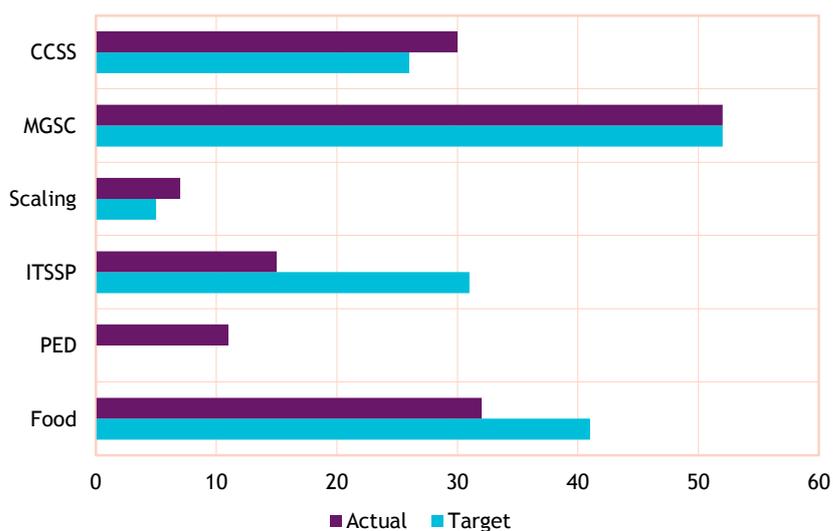
Since 2012 targets have been set for the number of projects to be undertaken in total and by sectors as defined by Enterprise Ireland. Therefore for the period of the evaluation targets data can only be assessed for 2012. In terms of overall project numbers 147 projects were funded in 2012 against a target of 155, which means that 95 percent of its target was achieved.<sup>7</sup> As Figure 10.3 indicates the targets for sectors and LBO stages were met in some areas and not others.

<sup>7</sup> Based on the Lean Unit database

**Figure 10.3 (i): Comparison of target vs. actual number of LBO projects (by programme stage) 2012**



**Figure 10.3 (ii): Comparison of target vs. actual number of LBO projects (by sector/activities) 2012**



Source: compiled by Technopolis from the EI Lean Unit database

Acronym	Definition	Acronym	Definition
Food	Food	Scaling	Scaling and High Potential Start-ups
PED	Micro Enterprise, Small Business and Potential Exporters	MGSC	Manufacturing, Global Sourcing and Competitiveness
ITSSP	Internationally Traded Services and Software	CCSS	Construction, Consumer and Support Services

## Consultants

Consulting in the Lean approach and Lean processes is a specialist skillset and Enterprise Ireland has developed a comprehensive list of potential consultants. For grants approved up to the end of 2012, 78 consultants have been deployed to work on LBO projects. However 50 percent of the projects had been conducted by just seven consultancies. Consultants are mainly specialised in construction, food and manufacturing - the same sectors with significant participation.

## Profile of LBO participants

### Company size

In line with the Enterprise Ireland client base the majority of participating companies are SMEs. However, the average Lean programme participant is larger than the average EI client (Table 10.9).<sup>8</sup>

**Table 10.9: Client companies characteristics in 2006-2011**

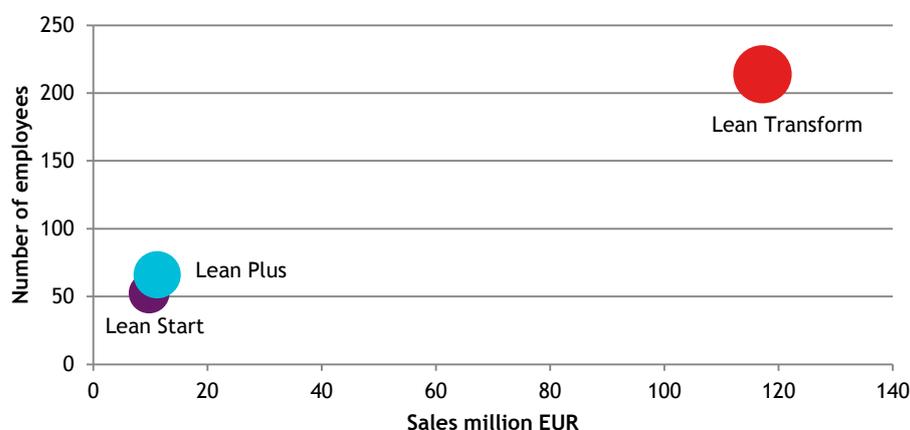
	Companies that were part of the LBO (2009-2012)	Other Enterprise Ireland client companies (2009-2012)
Sales	€19.7 million	€10.7 million
Employees	68	33
Export intensity	35%	40%

Source: compiled by Technopolis from the EI and ABSEI databases

The average size of participants has been increasing as the programme has progressed, which is due to the greater number of the larger Lean Transform projects over time (company profiles for each stage of the LBO has been reasonably stable over time). Lean Transform projects are typically undertaken by much larger companies (Figure 10.4). While Lean Start and Plus projects are being undertaken by small companies and Lean Transform by much larger companies, there appears to be a gap in participation among mid-range companies (100-150 employees and a turnover of €50-€100 million). This needs to be investigated further by the Lean Unit and there may be a need to promote the programme to this group of companies more intensively.

<sup>8</sup> Formal tests indicate that the differences in number of employees and sales are statistically significant, while the export intensity is not

Figure 10.4: Size of participating companies (by stage)



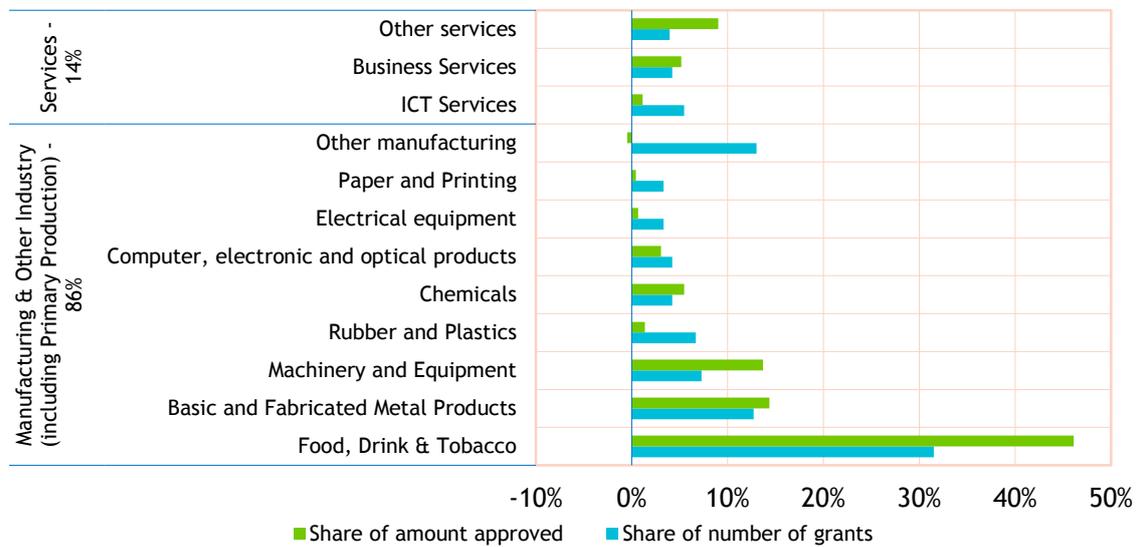
Source: compiled by Technopolis from the EI grants database

### Sector

Participants to date are predominantly from manufacturing sectors (86 percent in terms of both number and value of projects) a figure much higher than for entire population of grants approved by Enterprise Ireland in 2009-2012, where 59 percent of companies are in the manufacturing sector.<sup>9</sup> The largest share of participants (in both number and value of grants) is in the Food and Drink sector (Figure 10.5). The particularly high value of grants aligns with a large number of Lean Transform projects in this sector. The attraction of the programme to manufacturing businesses is likely as a result of that fact that the concept of Lean originated in manufacturing. However, it is increasingly recognised that the Lean approach and its tools and techniques are applicable to services, and the Lean Unit is encouraging participation from such sectors.

<sup>9</sup> The difference in the distribution across manufacturing and services for Lean and other grants is statistically significant,  $\chi^2(1) = 111.21$ ,  $p\text{-value} < 0.001$ , significant at 90 percent confidence level

Figure 10.5: Sector of participating companies



Source: EI grants database

**Location**

Geographically nearly half of participants (46 percent) are from the South and East region (excluding Dublin region), a third from the Border, Midland and Western region and 21 percent from the Dublin region. This distribution is considerably different from the entire population of grants approved by Enterprise Ireland in 2009-2012 in which there is a much higher concentration of grants in the Dublin area.<sup>10</sup> Again this is likely to be a result of the high number of food manufacturing companies in the programme.

**Prior support from Enterprise Ireland**

At the time of their first engagement with LBO, 87 percent of participants had received support by other programmes of Enterprise Ireland since 2005. Only 45 companies received Lean grants in their first year of collaboration with Enterprise Ireland and of these companies 15 also received another types of grant in the same year.

Most LBO participants have been involved in more than one scheme prior to LBO, most often capacity building and internationalisation. Furthermore participants are more likely than other Enterprise Ireland clients to have had a first engagement with Enterprise Ireland that involved a combination of programmes from different thematic areas.

The value of previous support from Enterprise Ireland varies with the size of the company and the stage of engagement with LBO (these two factors are aligned in that smaller companies participate in Lean Start and Plus and larger companies in Lean Transform). The average value of total grants

<sup>10</sup> A formal test indicates that the distribution across areas for Lean grants and other Enterprise Ireland grants is significantly different,  $\chi^2(2) = 47.96$ ,  $p\text{-value} < 0.001$ , Significant at 99 percent confidence level

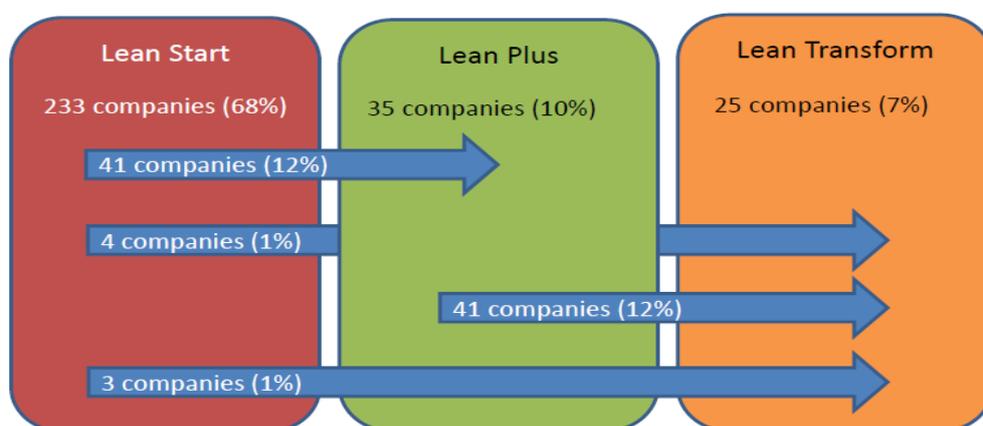
approved per participating company from all Enterprise Ireland schemes (for the period 2009-2102) was €500,000, €725,000 and €2.7 million respectively for Start, Plus and Transform participants.

### Progression through the programme

It is intended that many companies will progress through the programme’s stages in order to create a sustainable change in culture within participating companies. To date, 68 percent of participating companies have undertaken Lean Start only. This is to be expected, as Lean Start is the intended first stage of engagement. A further 17 percent joined the programme at the Plus or Transform stage demonstrating that the programme is flexible enough to accommodate companies with differing levels of experience in business improvement.

Fifty companies (15 percent) have already progressed through more than one stage. 41 companies (12 percent) have progressed from Lean Start to Plus, while three have undertaken all three stages. Two companies have progressed from Plus to Transform and four companies jumped straight from Start to Transform. This suggests that the programme is having its desired effect in terms of leading companies from a demonstration of Lean principles through to more substantial business change projects. It can be expected that more companies will progress through the stages as the programme continues as the majority of participants start their journey with Lean Start. However it is interesting to note that the majority of Lean Transform do not have predecessor projects in Start or Plus suggesting that the large companies that typically undertake these projects do not necessarily require the Lean Start and Plus programmes first in order to participate.

Figure 10.6: Progression through the programme



Source: compiled by EI from the Enterprise Ireland grants database

### Output indicators for the programme

The output indicators identified in the programme logic model are presented in Table 10.10. The data for these metrics has been collected via the Lean Unit database and the survey of LBO participants.

**Table 10.10: Output indicators**

Output	Indicator
The number of LBO projects completed	Number of final reports delivered to Enterprise Ireland
Improved staff capabilities in Lean	Number of staff trained in Lean principles
Number of companies with on-going senior management commitment to Lean	Number of Lean champions appointed
Productivity improvements achieved (as result of specific process improvement projects undertaken)	Quantifiable productivity improvements evident (as a result of the specific process improvement projects undertaken)

Source: Technopolis

#### Number of projects completed

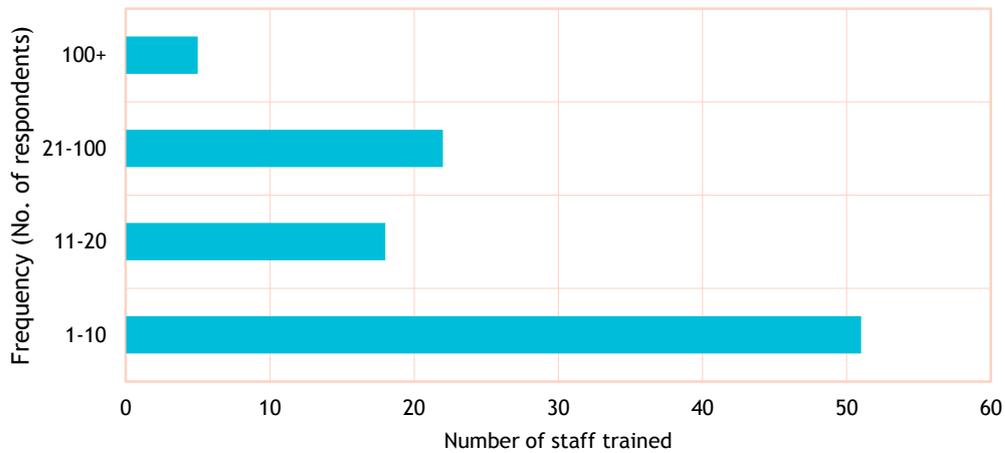
It is estimated that around 70-75 percent of approved projects have been completed. Some of the remaining projects will most likely be completed given that their two-year drawdown period has not yet been reached.

#### Improved capabilities in Lean

The survey of LBO participants collected data on the number of staff trained during their participation in the programme (Figure 10.7). A total of 2,366 staff trained was reported by survey respondents. Grossing up the number of staff trained to the population of participating companies leads to an estimate of the total number of staff trained as a direct result of the programme to 6,029.

In addition survey respondents report a high level of direct benefits in the form of improved skill and capabilities and improved awareness of Lean principles and tools and techniques. 60-65 percent reported significant benefits and 35-40 percent small benefits.

**Figure 10.7: Number of staff trained in Lean principles**



Source: LBO participants survey

### Senior staff commitment to Lean

Participants reported a high level of staff commitment to Lean principles as a result of their participation in the Lean programme. 57 percent reported significant benefits and 41 percent small benefits. Less than 2 percent reported no benefit.

A more direct indicator of senior staff commitment (and an intended effect of an aim of Lean Plus and Transform projects) is the appointment of a Lean Champion and/ or a continuous improvement team to take forward further Lean activities and start to embed the concept across the company. 58 percent of respondents reported that a Lean Champion has been appointed as a direct result of the programme and 53 percent that a continuous improvement team has been established.

### Quantifiable productivity improvements

The LBO final reports record in detail the activities undertaken and the specific process improvements made as a result of each project. Indicators may include:

- Reduction in materials costs through reduced waste, re-work etc.;
- Improved workflows;
- Reduced inventory and work-in-progress;
- Reduced set-up time and downtime;
- Increased staff utilisation rates;
- Increased production area / more efficient use of production area; and/or
- Improved lead times and delivery performance.

Companies also report 'final' productivity indicators in metrics or units most relevant to them such as labour costs as percentage of sales, materials costs as percentage of sales, value-added per employee, overall equipment effectiveness (OEE). Benefits may also be in the form of increased production capacity through better deployment of materials, people and space, that while not

increasing productivity immediately, offer the potential for productivity increases as the additional capacity is put to use (to deliver additional sales with the same inputs).

More closely defined output metrics designed to capture productivity and capacity increases more consistently are recorded as:

- Productivity increases:
  - Annualised cost savings in € ;
  - Cost savings as percentage of sales;
  - Cost savings as percentage of COGS (cost of goods sold); and
- Capacity increases:
  - Percentage output capacity increase;
  - Potential impact on turnover; and
  - Other project benefit (e.g. defects, lead time etc.).

The outputs are collated (from individual final reports) in the Lean Unit database. However even with more closely defined indicators there is room for variability in their interpretation and reporting. For example companies may report annualised cost savings as percentages instead of monetary values and capacity increase may be reported as percentages, time, staff utilisation rates or overall equipment effectiveness. In addition, the recorded improvements do not specify whether they apply to whole company or just the process area that was the focus of the LBO project. Therefore aggregating the data to provide an overall estimate of the direct benefits of the process improvement projects undertaken under the Lean programme is not possible.

Nevertheless to illustrate the benefits achieved the outputs as recorded in the Lean Unit database have been counted and visualised. This analysis shows that, for the output data (extracted from final reports) recorded in the Lean Unit database 83 percent of projects report a benefit arising - 77 percent of participants report a productivity improvement, capacity increase or both and further 6 percent report other forms of improvement (Table 10.11).

**Table 10.11: Recorded process improvements**

Type of improvement reported	Number of projects reporting an improvement	% of all final reports available
Report both cost savings & capacity increases	108	52%
Report costs savings only	41	20%
Report capacity increases only	10	5%
Report some other benefit (not cost or capacity)	12	6%
TOTAL no. of projects reporting benefits	171	83%
TOTAL no. of final reports available / reviewed	207	83%

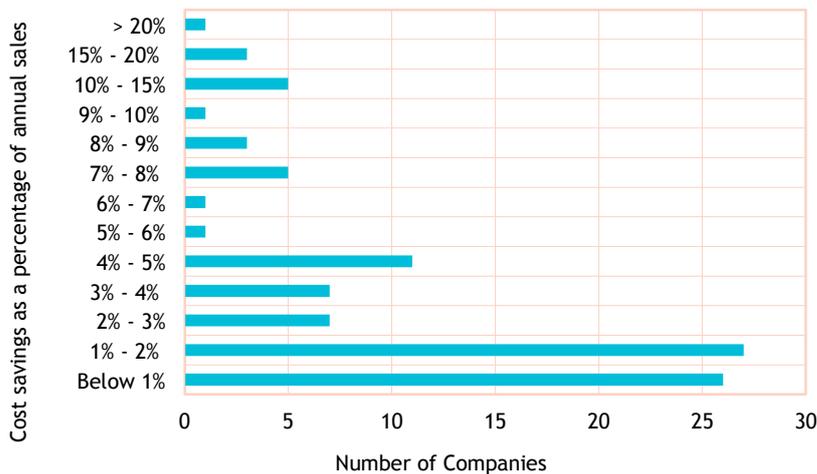
Source: compiled by Technopolis from the Enterprise Ireland Lean Unit database

The percentage improvements are presented in Figure 10.8 and Figure 10.9, however, it must be noted that the figures may apply to the whole company *or* to the specific process area that was the focus of the LBO project - for small companies in particular these may be one and the same. The figures are intended to be illustrative only.

This analysis suggests that the majority of participants achieve process improvements as a direct and immediate benefit of participation in the programme. Given that the majority of projects are small Lean Start interventions this is a considerable achievement.

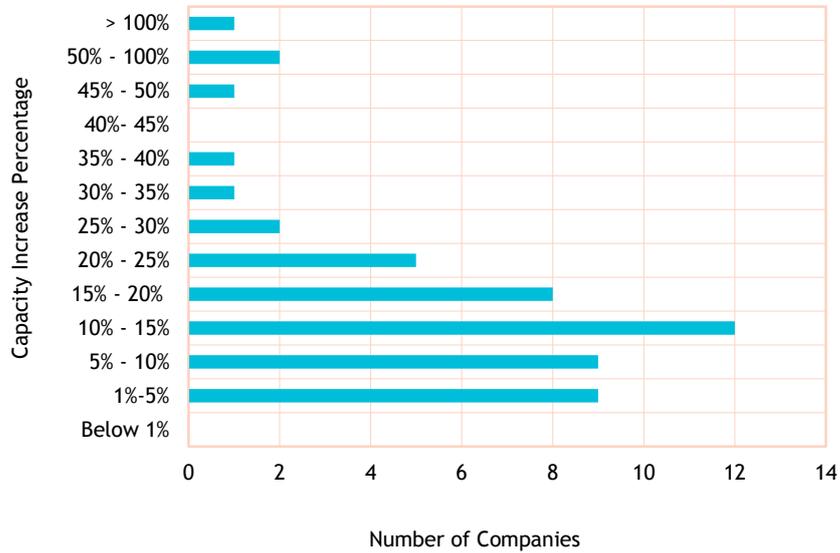
Importantly the reports also record benefits in the form of restructuring the company business model, higher staff morale and engagement and, most importantly, the implementation of regular reviews of key performance indicators, all suggesting that further improvements will be made.

**Figure 10.8: Reported productivity improvement (number of companies)**



Source: compiled by Technopolis from the Enterprise Ireland Lean Unit database

Figure 10.9: Reported capacity increase (number of companies)

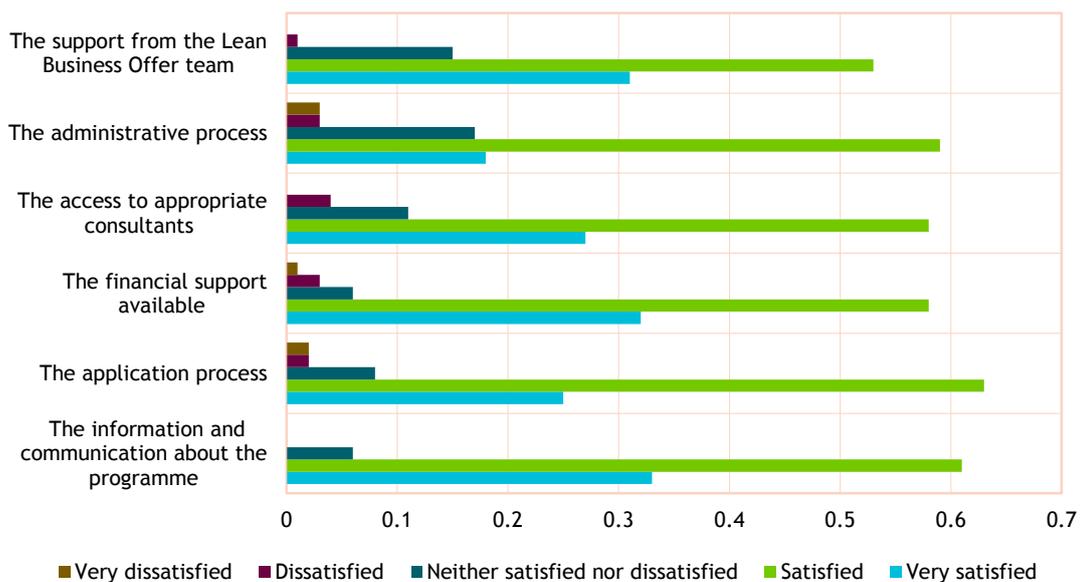


Source: compiled by Technopolis from the Enterprise Ireland Lean Unit database

**Client companies’ satisfaction with activities and outputs**

In general participants were very satisfied with their experience of the programme in terms of both the operational aspects (Figure 10.10) and the extent to which their objectives for participation were met (Figure 10.11).

Figure 10.10: Participants’ satisfaction with programme operations



Source: LBO participant survey

Figure 10.11: Extent to which objectives for participation were met



Source: LBO participant survey

## Impacts and outcomes

### Introduction

As this is an interim evaluation the focus is on productivity improvements as the key *outcome indicator* (as defined in the programme logic model). This is distinct from the productivity improvements reported as *outputs* in that the output productivity indicator focused on the improvements that were a direct result of the Lean projects undertaken. The outcome productivity indicator is focused on the productivity improvement across the entire company. Defined in this way the indicator includes additional improvements resulting from the deployment of the new skills and capabilities acquired during the LBO project and furthermore, is evidence of the sustainability of these skills and any resulting culture change. The impact indicator of (increased) exports would be tested at a later ex post evaluation.

### Outcome indicators for the programme

In this section indicators from two sources are presented to address the productivity outcome indicator:

- Survey evidence: to demonstrate the sustainability (and re-use) of the Lean skills and capabilities acquired (and that may lead to effects on productivity)
- ABSEI data: undertaking econometric analysis to determine the effect on participants' productivity in terms of sales per employee and to compare the effect with a matched sample of non-participants (i.e. the counterfactual analysis)

### Survey evidence

86 percent of survey respondents reported that the skills acquired under the Lean programme have been sustained since their grants came to an end. 40 percent of participants have undertaken

additional Lean projects and trained additional staff in Lean principles since their LBO project. A further 40-50 percent intend to do so in the next 6-12 months. Survey respondents report an additional 630 staff trained and 18 projects undertaken since completion of the LBO programme. Grossing up to the population of participating LBO companies leads to an estimate of 1,600 staff trained and 480 projects undertaken since completion of the LBO programme. This indicates a considerable level of sustainability of the skills acquired. Furthermore 50 percent of respondents report that a culture of business improvement has been established in their company and 34 percent that they are 'well on their way to establishing such a culture' change. The remaining 16 percent report that they are 'at the beginning of the journey of culture change'.

### ABSEI data - econometric analysis

On average, every year after the grant that was paid, Lean client companies had an annual productivity value that was of the order of €37,000 per employee higher than companies in the control group (significant at 95 percent confidence level). Based on an average productivity before involvement in the programme of €187,000 sales per employee this is an uplift of 20 percent. It is important to note that this analysis focused on productivity in terms of annual sales per employee and as such cannot pick up any programme effects on capacity increases that have yet to impact on sales. Therefore future assessments may reveal a greater effect on productivity.

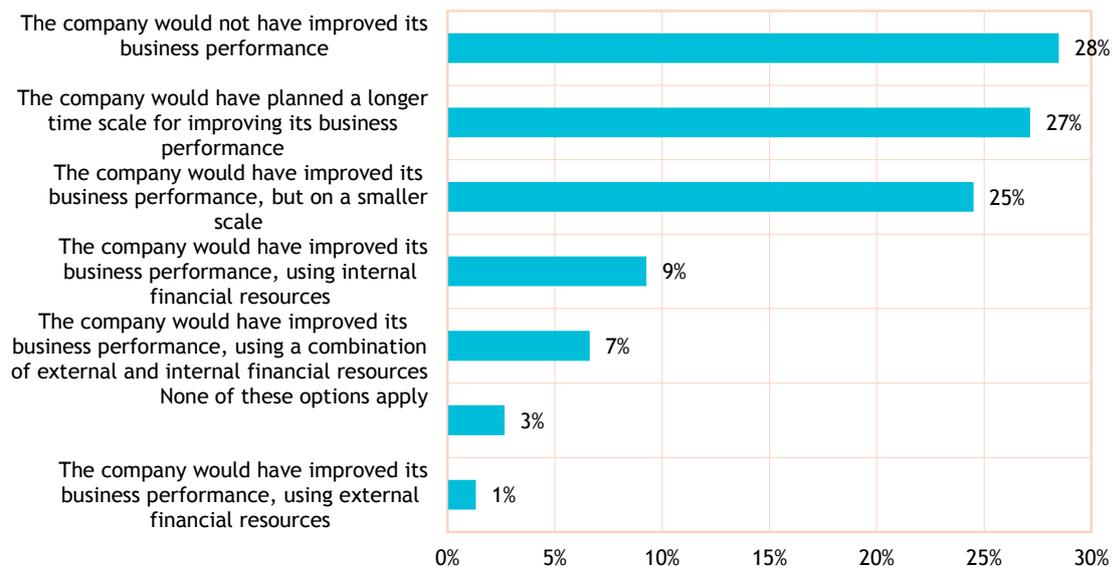
The econometric analysis also revealed that the increase in productivity was not at the expense of jobs. The analysis showed that the Lean has a positive impact on sales (of the order of 40 percent) and employment (11 percent). These results suggest that companies participating in the Lean programme not only become more productive and but also increase their capacity and increase sales to utilise the additional capacity. This is entirely in line with the output metrics recorded and the survey outputs, and it suggests that a future ex post evaluation will reveal programme impacts. The survey and programme of interviews reinforced this finding with most interviewees stating that they did not participate in order to decrease jobs but to increase efficiency in order to retain and grow sales. This point was important to interviewees as employee buy-in to Lean principles is dependent on the process being seen as beneficial to all concerned and not simply a cost-cutting exercise. Wider benefits for employees included greater job satisfaction both through being involved in the Lean process and via the end results such as working in a more logically designed and tidy environment.

### Impacts of the programme

While the key impact indicator of (increased) exports would be tested at a later ex post evaluation, the survey results (i.e. self-reported impacts) demonstrate the effect of participation on competitiveness, sales and exports. Companies report wider effects on their competitiveness through the application on the Lean principles. 42 percent report a significant impact on delivery schedule adherence (and 43 percent a small impact), around 30 percent report a significant impact on product/service quality and customer relationships (and 50-60 percent a small impact), and 24 percent report a significant impact in terms of reduced unit costs of their products and services (and 65 percent a small impact). A smaller proportion reports a subsequent impact on sales and exports but nevertheless benefits are reported with the most frequently cited impact being on exports. 26 percent report a significant impact on exports (overseas sales) and 35 percent a small impact. A small number have entered new markets with the most frequently reported markets being the UK and the Eurozone.

Companies were asked about what would have happened to their business in the absence of the support from the Lean programme. Around a quarter of companies would not have improved their business performance while another quarter would have planned a longer timescale for improvements or undertaken improvements on a smaller scale (figure 10.12).

**Figure 10.12: What would happened without the Lean programme**



Source: LBO participant survey

Companies were asked about the effect of the LBO in the context of the economic downturn. 72 percent agree with the statement that the support provided by LBO has helped their company weather the negative consequences of the recent economic downturn. This is entirely in line with the interviews with participating companies (and with the DAs); companies knew that they needed to improve their processes and become leaner and more competitive. They reported that during the period of rapid economic growth there was no incentive to focus on being lean as the sales growth was sufficient to support profits (and employment) without increased efficiency. As one interviewee put it ‘there was enough fat in the system’. In contrast the economic downturn has created a much more competitive environment - contracting markets, considerable pressure on prices and a greater need to seek overseas sales. In this environment only the fittest companies will survive and therefore the Lean programme has provided an opportunity for those companies that fully understand the implications of the downturn to focus on their competitiveness.

## Case studies

Two short case studies are presented to illustrate the activities undertaken and the form of the benefits.

### Case study 1: Mantis Cranes

#### Mantis Cranes

A Lean Start project approved in 2011

A Lean Plus approved in 2012 (almost complete)

Mantis Cranes is a manufacturer and a hirer of self-erecting cranes based in County Donegal. Since the recession began a greater portion of its business has been focused on the hire of cranes to clients, the majority of which are in the UK. The company typically receives 30-40 breakdown or service calls a month from its clients who are located across the UK and serviced by three different depots and their engineers.

The Lean Start and Plus projects have reduced the recorded breakdown rate, measured in terms of the number of breakdowns per hire week, from 20 percent to 7 percent. By conducting a root-cause analysis of breakdowns they have been able to better understand how and why they occur and as a result have shifted from reactive approach to maintenance to a robust system of preventative maintenance - a significant culture change for the organisation. Cranes are now in a much better condition when hired and less likely to experience a breakdown. In addition, the better understanding of equipment has enabled the company to provide more informed support via the helpdesk such that more problems can be remedied remotely without sending an engineer into the field. Equipment condition and breakdowns are now managed in a proactive rather reactive manner leading to a higher productivity of their engineers and decreased engineering costs.

This has enabled the company to be more competitive, not specifically on market price, but on the quality of service, influencing sales through an offer to clients of increased 'up-time' of equipment. In recent years they have increased revenue and employment in part as a result of the Lean projects.

The company reports that the benefits of the early projects are clear once realised and are hard work to achieve but they are necessary to convince sceptical staff. The company appointed a Lean Champion during its Lean Plus project and is in the process of instilling a culture change.

Source: Technopolis, interviews with programme participants

## Case study 2: Klasmann-Deilmann

### Klasmann-Deilmann

A Lean Start project approved in 2009 or 2010

A Lean Plus approved in 2011

A Lean Transform approved in 2012

Klasmann-Deilmann Ireland is part of a 100 year old international group based in Germany supplying organic substrates and peat products to the horticulture and food industries. Klasmann-Deilmann Ireland focuses almost entirely on peat production and 95 percent of its products are exported.

The harvesting of peat is a seasonal (summer) business and therefore productivity improvements are essential to maximise the potential of a short season. The company wanted to shift its thinking from a reactive to a proactive approach to process planning and problem-solving. This required a significant shift in culture with much greater levels of employee engagement in designing and implementing process improvements. The company visited other successful businesses in other sectors to learn from their experience. As a result of the three projects the whole company has been engaged with the Lean approach and considerable change has occurred. An 'action board' meets once a week at company level and a number of process improvement projects are underway at any point in time. Each department has a target of six problem-solving meetings a year and each makes use of skilled internal resources. The consultant contracted under the Lean transform project reviews the success of the problem-solving activities and improvement projects.

The company has invested considerably in its Lean activities under Lean Transform and has improved its productivity during the harvest season by just over 50 percent. This means it is able to harvest and sell 50 percent more product per year for the same inputs. In addition the administrative processing of sales information has been decreased from 7-8 minutes to 2 minutes ensuring that the additional product is sold and is sold efficiently. As is often the case in process improvement initiatives, staff were initially concerned that the Lean approach would lead to job cuts or wage reductions but staff have redeployed to other areas of the business, gained new skills and received an annual wage increase. 2013 is expected to be their best year since 1980, largely due to the projects under the LBO.

Source: Technopolis, interviews with programme participants

## Cost-benefit analysis

As this is an interim evaluation a full cost-benefit analysis has not been undertaken, however the expenditure and benefits to date can be compared at a project level. The following are therefore indicative results.

Lean Start represents 70.2 percent of projects approved, and they also represent a greater percentage of projects completed. The estimated total cost per project for Start is €8,900 and Plus is €53,600.<sup>11</sup>

---

<sup>11</sup> These have been estimated as: Lean Start - €5,000 from the Lean programme, €1,300 from the company and an estimated €2,600 in indirect costs to Enterprise Ireland; Lean Plus - €24,000 from the Lean programme, €27,000 from the company and an estimated €2,600 in indirect costs to Enterprise

Therefore if most projects have been the lower cost Lean Start and the average benefit is a productivity improvement of €37,000 of annual sales per employee (which is expected to be maintained for several years and for further Lean improvements to take place) this suggests that the benefits outweigh the costs and that a future cost-benefit analysis will yield positive values. It is possible that the benefits may be skewed towards the higher cost projects but this will need to be tested for when more projects of each type have been completed.

A simple estimation based on the average gains estimated from the econometric analysis (i.e. €37,000 of annual sales per employee) suggests that total productivity gains are around €662 million. This assumes that companies accrue productivity gains a year after they participated in the programme. So, for example, in 2009, 19 companies had a grant approved for LBO (and used it). Those companies had a total of 1,086 employees in 2010 (when the effect of the programme is expected to have materialised). For this group the total productivity gains were €40 million. More companies joined in 2011, hence the aggregate effect is bigger as shown in Table 10.12.

**Table 10.12: Estimation of gross productivity gains (based on completed projects)**

Year of approval	Number of companies that had a grant approved for Lean	Total number of employees, in year following first approval	Total productivity gains (in million EUR)
2009	19	1,086	40.2
2010	76	4,127	152.7
2011	175	12,682	469.2
<b>Total</b>			<b>662.1</b>

Source: Technopolis (2013)

Again, this is only a rough estimation as the benefits are likely to vary according to the size of the companies. However, not enough data is available to make reliable estimations for different categories or types of companies.

## Conclusions and findings

### Appropriateness

Business competitiveness is not only essential for business growth but in highly competitive markets in challenging economic conditions it is necessary for survival. During Ireland's economic boom increased productivity was not necessarily a priority for managers - sales growth was sufficient to support businesses growth, support jobs and retain or increase profitability. In contrast, when markets contract, competition is fierce and there is a downward pressure on prices and subsequently on profitability. In this context the introduction of the LBO was highly

---

Ireland. Indirect costs per project are a simple estimate based on total indirect costs divided by number of projects.

appropriate and timely. After 2008, businesses recognised that they needed to focus on productivity in order to ensure their businesses could weather the economic downturn. This is not to say that they were not unaware of the potential for process improvement prior to that but that it became a much higher priority.

After 2008 national policy reemphasised the imperative to return to export led growth that was sustainable and on growth that would support job creation. As a result there was an increased focus on policies to support innovation, productivity and cost competitiveness. Therefore the Enterprise Ireland's LBO was (and is) fully in line with national policy and in line with the objective of Enterprise Ireland to enable Irish owned businesses to increase exports through competitiveness. Importantly the evaluation has demonstrated that the productivity improvements achieved have not been generated at the expense of jobs.

The design of the programme in terms of Lean training and support to implement Lean (i.e. learning-by-doing) not only develops skills but also demonstrates the benefits of Lean to senior and operational staff. Moreover, the design of the programme in terms of the three stages of escalating engagement that can be undertaken individually or sequentially enables companies to join the programme at a point most relevant to their skills and experience and/or to develop their skills and ability to implement Lean in a staged process. In this way the LBO is able to meet the needs of Enterprise Ireland's broad client base. Overall the programme is well designed, the offer is simple in concept and clearly described in public documentation and websites - companies, consultants and Enterprise Ireland development advisors understand the offer and its expected outputs.

### Effectiveness

As an interim rather than ex post evaluation the focus was on outcomes in terms of productivity improvements rather than impacts in terms of exports or value added. The analysis revealed significant effects on the productivity of participating companies.

Lean projects delivered immediate benefits to participating companies. 77 percent reported improvements in productivity and/or capacity increases in their final project reports. Furthermore, the survey demonstrated that considerable numbers of staff have been trained in Lean principles and techniques both during and after their participation and additional Lean projects have been undertaken. Not only does this suggest that programme effects will be sustainable and on-going, but the econometric counterfactual analysis reveals that is in fact the case. On average, every year after the approval of a grant that was drawn down, Lean client companies had an annual productivity value that was of the order of €37,000 per employee higher than companies in the matched control group. This represents an increase of 20 percent.

In addition, the econometric analysis on sales and employment and the survey outputs also provide strong evidence for improved productivity leading to increased competitiveness which in turn will lead to increased sales, exports and employment. These factors should be tested in a future ex post evaluation.

### Efficiency

In the period evaluated the programme has engaged with 343 companies in 403 projects and approved grants to a value of €14.04 million. The amount actually spent at the time of evaluation is €6.3 million in direct programme costs plus an estimated €1.07 million in indirect costs to Enterprise Ireland (a total cost to the State of €7.37 million). Company contributions are estimated

at €44.6 million. The interim evaluation has focused on the productivity metric and therefore no estimate of total benefit in terms of value-added can be directly calculated. Nevertheless the fact that the majority of completed projects have been the small scale Lean Start projects costing an estimated €8,900 each have led to an average productivity improvement of €37,000 in terms of annual sales per employee suggests that the benefits outweigh the costs and that a future cost-benefit analysis will yield positive values. A detailed cost-benefit analysis should form part of an ex post evaluation when more projects have been completed.

A future evaluation will need to carefully consider the role of the different type of projects in creating impacts as the majority of the public funding approved to date (75.8 percent) has been allocated (but not expended) to the very large Lean Transform projects. So far 38 Transform projects have been approved and a significant number of these will need to be studied in detail as the particulars of each project are likely to be very different (company size, sector, export levels, prior Enterprise Ireland support) and the impacts of such large interventions (an average of €280,000 grant per project) will be expected to be significant. Therefore it is recommended that a series of detailed case studies are undertaken for a representative sample. It is likely to be difficult to conduct the counterfactual analysis with ABSEI data as identifying a matched sample may not be possible if a large proportion of medium to large sized companies participate in the programme.

### Recommendations

The Lean programme should be continued in its present form. No significant changes are recommended but some observations are made to improve the programme overall:

- To ensure the sustainability of improvements and the embedding of a culture of continuous improvement the on-going programme needs to ensure a balance of new companies coming into the programme and the progression of existing participants through the stages of the programme. However, for many small companies Lean Plus is a major change initiative and therefore progression from Start to Plus to Transform may not be appropriate in all circumstances.
- It is recommended that targets be set for each individual stage of the programme and for the progression of companies from Lean Start to Lean Plus to ensure that the momentum developed within the Lean Start companies is not lost.
- The low number of medium-sized companies participating in the programme needs to be investigated further to determine if: (i) they have considered the Lean programme but opted not to participate; or (ii) have not yet been approached or recommended for participation. Targets for participation might also assist here.
- On more operational matters it is recommended that output metrics include the number of staff trained in each project and the appointment (or not) of a senior member of staff responsible for Lean/continuous improvement. In addition it is advised that the output metrics on productivity clearly record whether improvements apply to the entire company or a specific element of the production line. Converting the final report format into a spreadsheet would also facilitate the collation of outputs by the Lean Unit.
- It is recommended that an ex post evaluation is undertaken at the end of 2015 when a larger group of companies will be expected to have progressed through the programme and a considerable number of Lean transform projects will have been completed.

- In addition it will be beneficial to develop key indicators for each Lean Transform project from the outset in order that (i) a baseline for each project can be established; (ii) relevant data is collected at the end of the project and compared to the baseline and then (iii) re-visit the indicators at a future date. The data at (i) and (ii) could be used to develop an early case study of the project that could be updated during the later evaluation. Furthermore, extra focus should be placed on increasing responses to ABSEI surveys for firms in receipt of funding by the agencies.

## Appendix I Data Sources and Methodology

Three sources of secondary data are used in this evaluation:

- **Annual Business Survey of Economic Impact (ABSEI).** The ABSEI gathers the results of the surveys that Forfás administered annually since 2000 to agency supported Irish-owned and foreign-owned firms in Ireland. The average annual response rate of ABSEI is around 60 percent of the target population of 6,404 EI companies. The database contains longitudinal information with some gaps for non-responses. Data collected include sales, employment and exports for the period 2000-2012; and value added and R&D expenses for the period 2000-2011. ABSEI also provides information on the industry, region and type of ownership of the company.<sup>12</sup>
- **Enterprise Ireland client database.** This database includes the population of grants approved by Enterprise Ireland from 2005 to 2012. This covers information on 18,655 grants, targeted to 6,270 companies. Available information includes the approval year, amount provided and amount granted, and the details on the type of programme. This database indicates that between 2009 and 2012, Enterprise Ireland approved grants under the Lean programmes to a total of 343 companies.
- **Forfás Annual Employment Survey.** This database provides longitudinal information since 1972 on employment levels in manufacturing and services companies under the remit of IDA Ireland, Enterprise Ireland, Shannon Development and Údarás na Gaeltachta. 18,784 company sites are present in the database.

All in all, these three sources of information provide data on 22,833 companies. However, the information is not complete for all of them, which implies that the number of companies with available information from all different sources is far less than that.

That the overlap among the three sources of secondary data corresponds to 2,665 companies for which information is available on the participation in the Enterprise Ireland business support programmes, employment and ABSEI data. The final overlap of the three sources leads to a complete set of data for 285 companies that participated in LBO.

In addition, in 2011 Enterprise Ireland developed a database system to monitor and analyse progress and performance of the Lean projects. This database also provided a data source for this analysis.<sup>13</sup>

### Methodological remarks regarding the secondary data

There are four important remarks to be made regarding the secondary data

- The fact that there is not complete information for all the companies has consequences for the number of observations used in the analyses presented in the report. In particular, the

---

<sup>12</sup> Standard routines for outliers identification and treatment were performed before using ABSEI data in the analysis.

<sup>13</sup> This database contains fewer projects than the Enterprise Ireland grants database and is therefore less comprehensive as it was not started until 2011. Nevertheless the additional data fields it contained were used to supplement the data in the formal sources described above where it has been useful to do so.

analysis of the trends of performance indicators has been performed only on a sub-sample of companies present both in the Enterprise Ireland client database and the ABSEI database (for sales, exports, productivity and value added) or the Employment Survey (for number of employees i.e. 285 companies).

- Both the ABSEI and the Enterprise Ireland client are based on information collected through surveys. So, even though the response rate is remarkably high in both cases (60 percent for ABSEI and close to 90 percent for the Employment Survey), there are still gaps in the series of longitudinal data, which require appropriate statistical treatment.
- The coverage of both surveys has increased consistently over time, meaning that the number of missing data is much lower for more recent years than in 2000.
- Companies included in the more recent surveys tend to be smaller than those established firms already in the database. This may create biases in estimates of the impact of the LBO on company size. To address this issue, trends on sales and employment are not presented, and only indicators that are expressed as share of those variables are presented (e.g. exports as a percentage of total sales). Additionally, the econometric analysis controls for indicators of sales and employment in order to address this issue of scale.
- Sufficient measures have been taken to take account of these issues with the secondary data sources used for the evaluation analysis.

