

# **Feasibility Study – Exploring the Long-Term Impact of Business Improvement Services**

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## Feasibility Study – Exploring the Long-Term Impact of Business Support Services

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*This report is a feasibility study examining whether it is possible to observe a longer term impact of business improvement schemes and is not intended to be a detailed evaluation of the former Business Link intervention. The report, therefore, covers the methodological issues of assessing the economic impact of business interventions over an extended time period.*

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### Abstract

This report is a feasibility study examining whether it is possible to observe a longer term impact of business improvement schemes in general using the old Business Link (BL) offer in England in 2003 as an example. The report covers the methodological issues of assessing the economic impact of business support interventions over an extended time period, although the findings will be of interest to policy makers. Building on the published evaluation of BL in 2006 this new analysis uses 7 additional years of employment and turnover data from the ONS Business Structure Database (BSD) to demonstrate the value of longitudinal evaluation time frames.

**Key words:** Business Support   Evaluation   Long-term impact

**JEL Codes:** L25; L53

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### Executive Summary

- Governments across the globe have a range of policies to assist small businesses to start up and grow, in order to promote the desirable outcomes of growth and job creation. Whilst there is often a desire for the effectiveness of a new scheme to be assessed, there is concern that often a too short period of time is allowed before an evaluation takes place, which limits the chance of the impact of any intervention to have been fully realised.
- This research first undertakes a literature review to identify to what extent evidence exists on the long-term effects of non-financial government interventions in the small business policy area. The review particularly looked for international examples of evaluations assessing impact over more than 3 years.
- The research then considers whether it is feasible to assess the long-term impact of UK based business support schemes using Business Link (BL) as an example. As such, this report is a feasibility study examining whether it is possible to observe a longer term impact of business improvement schemes in general and is not a detailed evaluation of Business Link. The report, therefore, covers the methodological issues of assessing the economic impact of business support interventions over an extended time period, although the findings will be of interest to policy makers.
- The research is conducted with a sub-sample of the original 3,448 respondents to the Business Link Operator (BLO) Economic Impact Survey in 2005 (BLO survey) which surveyed firms who were recipients of either an 'Intensive Assist' (IA) or 'Other Assist' (OA) in the first 6 months of 2003 (the categories defined by Business Link<sup>1</sup>). Firms in our sub-sample were linked to the ONS Business Structure Database (BSD) to obtain subsequent annual employment and turnover data to analyse the survival and growth of recipient businesses in the post-assistance period to see how long potential impacts may last over time.

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<sup>1</sup> Intensive assistance would usually have stretched over several months and a number of interactions between SME and Business Link advisors, probably featuring an action plan and the use of external consultants. In comparison, non-intensive assistance is more likely to be a “one-off” interaction by phone.

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### Literature Review Findings

- There were very few robust studies of the long-term impact of non-financial support (as well as financial ones) programmes to small firms among government sources and organisations such as the OECD and European Commission.
- Long-term impact studies for financial support schemes seem more popular with researchers because they would appear easier to measure. Despite this there are still very few in the public domain which is perhaps surprising when considering the proportion of government expenditure dedicated to them.
- One of the key concerns with evaluations, particularly those few long-term ones, is the use of a methodology based on a self-reported impact derived from survey. This self-assessment of, for example, a firm's satisfaction, perceived difference and additionality of a programme or intervention is likely to be highly subjective and may lead to both over- and underestimations of impact. In some evaluations the inclusion of control groups in the survey seeks to control for this and the application of econometric techniques further addresses the issues of selection and assistance bias. Whilst this approach does conform to best practice evaluation guidelines, there is a need to consider the long-term effects of the intervention as such surveys are typically undertaken shortly after the firm received the assistance.

### Feasibility Study Findings

- The increasing availability of administrative firm-level micro-data offers one potential solution to understanding the long-term impact of interventions. These datasets can either be official government data (e.g., the ONS Business Structure Database based on the Inter-Departmental Business Register - IDBR) or commercial datasets (e.g., FAME). Linking the beneficiaries of assistance to administrative data provides an opportunity for monitoring annual performance (i.e., employment and turnover) in the pre- and post-assistance periods as well as benchmarking against a suitable control group. Linking to other ONS business survey datasets introduces the possibility of more sophisticated econometric analysis as other variables on the characteristic of beneficiaries and non-beneficiaries become available (e.g., R&D expenditure and export sales)
- Another option is to take the original survey dataset of beneficiaries and non-beneficiaries and link it to an administrative micro-dataset to obtain annual performance data for many years after the original assistance and indeed after the original evaluation was undertaken. It is this

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option which is explored in this feasibility study using the original BLO evaluation survey in 2005 and extending the analysis to 2010 using annual data on employment and turnover from the ONS Business Structure Database (BSD) held within the Virtual Micro-Data Laboratory (VML).

- Using the Business Link (BL) intervention in 2003 as an example, this study found the benefits of that particular intervention is associated with strong business growth in subsequent years.
- Analysis of the surviving firms<sup>2</sup> assisted by BL in the 2004 to 2010 period points to markedly different growth behaviour by the IAs compared to OAs and non-assisted businesses. One key observation is that within the first three years from the date of intervention in 2003 to 2006 IAs and non-assisted businesses (NAs) show reasonably similar growth figures overall, whilst OAs experience a marked dip in terms of employment growth. However, over the longer period from 2004 to 2010, IAs experienced an average annual growth rate of 7.8%, OAs of 1.8% and the non-assisted control group recorded a growth rate of 4.1%.
- **However, some level of caution is required.** As might be expected from the attrition process over time the sub-sample of 'linked' assisted Business Link businesses portray some significant differences from the original samples. For instance, differences exist in business size, use of a business plan, business owner's age, sectoral composition and likelihood to export. It is clear that the 'linked' sub-sample does not fairly represent the full sample from the original survey, and that selection error is introduced on top of any selection bias that the original survey sample may already have been subject to. There are also risks of other schemes having had an impact on firm performance in the post-assistance period in addition to any impact from the original BL intervention. Disentangling these impacts is extremely difficult and has not been addressed in the analysis presented in this report. We simply run the original econometric models with additional years of performance data.
- Running these original econometric models, which will control for the sample differences within the new smaller sub-sample of IAs and non-assisted businesses, intensive assistance was found to have a positive

<sup>2</sup> We are, of course, dealing with a smaller number of firms than in the original evaluation study as the sample of 3,448 firms in the survey was reduced for three reasons: firms who did not give their permission to link their details to government datasets; firms had ceased trading; firms could not be linked to the ONS BSD as there was erroneous or missing data in the original data file. We ended up with a subset of 693 linked firms of which 345 survived the period 2004 to 2010.



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significant on employment growth for each period assessed<sup>3</sup>, except for the initial 2004 to 2005 period, where the coefficient takes a negative sign and is insignificant.<sup>4</sup> The 2003 intervention yields its highest measured impact for the time periods to 2009 and 2010 when intensive assistance increased the employment rate by about 24.5 percentage points. **These results suggest that there may indeed be a time lag before the full impact of assistance received becomes observable.**

- The impact of Business Link ‘other assistance’ (OA) on employment growth was not found to be significant for any of the time periods examined, however, the OA coefficient gradually gets stronger suggesting again that the realisation of the beneficial impact of assistance received seems to be a longer and more gradual process than most evaluations are able to allow for.
- The results of Business Link IA and OA on turnover growth also confirm this assessment. The impact of IA is rather weak for the 2004 to 2006 period and even negative<sup>5</sup> for the estimation of the initial one year period 2004 to 2005. Only in the fourth post-intervention year (for the 2004 to 2007 period) does the coefficient markedly strengthen, and eventually becomes significant for the 2004 to 2008 period, with a 32.6 percentage point impact on turnover growth. It then declines in the post-2008 periods as the economic downturn begins to take hold on business performance, but still with a relatively strong coefficient compared to the first three post-intervention years.

## Recommendations

- **This feasibility study would indicate that the time horizon for most evaluations of business improvement services is far too short.** The original Business Link evaluation could only consider the 2004-05 period to determine if there were any economic impacts. Whilst we also found positive and significant employment effects for the same period (using ONS employment data and not self-reported data from survey) our analysis shows a clear lag before larger and significant impacts on staffing and sales.
- We recommend, therefore, that consideration be given to introducing a twin-track approach to evaluation. There will always be the need to undertake an evaluation study based on survey evidence shortly after

<sup>3</sup> That is, we run the models for a range of ever-lengthening periods starting from 2004-05 (the original study period) – 2004-06; 2004-07; 2004-08; 2004-09 and 2004-10.

<sup>4</sup> In the original impact study, only the latter period was assessed but returned a significant positive result.

<sup>5</sup> But it is statistically insignificant.

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the introduction of a new policy intervention. That should continue due to the demands of policymakers and ministers but the value of linking beneficiaries to official administrative datasets for tracking performance data leading to robust economic impact assessments is clear and should be instigated for all major business support products and services. These datasets can then be combined and analysed to ensure that the long-term effects of assistance can be captured.

- We further recommend, that these datasets be linked to other official business survey datasets to provide additional variables over time (e.g., R&D expenditure; export sales) to avoid the over-reliance on the original beneficiary/non-beneficiary surveys. Indeed, this has the potential to create a range of control groups which may facilitate such economic impact techniques as Propensity Score Matching (PSM). For major programmes this is an investment which is both cost-effective and invaluable to obtain the most robust estimates of economic impact. The recent development of RCT protocols in connection the BIS Growth Voucher scheme (main programme and Small Business Charter programme) is another example of how data-linking methodologies are being used to track performance after the intervention.
- For the assessment of the long-term effects of business support products and services the sample size of the original beneficiary/non-beneficiary survey is a critical factor. In this feasibility study we have shown that, 7 years after an intervention, the attrition effects are considerable even after allowing for the fact that many firms will not give their permission for their data to be linked to other official government datasets. In this case we started off with a sample size of 3,448 and by the end we were running econometric models on a sample of just over 300 firms who had survived the full 7 years after the original evaluation. This illustrates the value of investing in a large enough sample in the first place. We recommend that when evaluations are commissioned the need for a long-term impact evaluation should be a compulsory part of the design feature and that appropriate samples are sought. This is important because the initial evaluation survey can provide a range of important variables not normally captured in the ONS administrative datasets (e.g., growth aspiration; strategic orientation and senior management profile).

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### 1. Introduction

It is a long-established global practice for governments to intervene in the small business sector to promote growth and job creation. The OECD (2008) states that:

*“Many OECD countries have made entrepreneurship an explicit policy priority in recent years, and governments’ policies now seek to affect the rate and type of entrepreneurship. As globalisation reshapes the international economic landscape and technological change creates greater uncertainty in the world economy, the dynamism of entrepreneurship is believed to be able to help to meet the new economic, social and environmental challenges.”*

With the need for small business policy being widely accepted, the OECD (2008) finds that there is a wide range of policies across countries. This support, aimed at supporting SMEs through a vast array of initiatives, represents a formidable share of governments’ budgets. In the UK alone, one estimate put the annual spend on support for small firms at £10.3billion for the financial year 2003/4 (PACEC, 2005) – made up of a mix of direct government spend, and indirect support through tax advantages.

Two overarching themes are usually referred to for the justification of this spend – job creation and economic growth (through innovation) (see e.g. Storey [2006], Henrekson and Stenkula [2011]). Government interventions are mostly justified on correcting market failures with these arguments dating back many decades - see, for example, Arrow [1969]. Bennett (2008) provides a list of more recent authors making these arguments.

Given the investment by governments in this field for a number of decades now, numerous policy approaches have been tried over time and across countries, and a somewhat incomprehensible variety of schemes have existed. For instance, in England the number of business support schemes was once estimated to be around 3,000 (BERR, 2007), although there was attempts to reduce the number to 100 mainly through reduction of duplication across different bodies.

However, whilst a good number of evaluations of schemes exist across countries, it does not come anywhere near the number of schemes that exist or did so in the past. Storey (2006) argued that while some schemes such as the UK’s Small Firm Loan Guarantee (SFLG) Scheme have been evaluated multiple times, other areas of support seem to have evaded evaluation entirely.

In relation to entrepreneurship policy, the OECD (2008) found that “results appear to vary” across countries, with a “lack of internationally comparable empirical evidence [that] has however constrained our understanding of entrepreneurship and many questions remain unanswered”.

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### 2. Objectives of the research

With SME and entrepreneurship policies falling into two broad categories of financial and non-financial nature<sup>6</sup> this review will consider the evidence of impact around the latter, seeking to draw on examples of evaluations of non-UK schemes where possible. Of particular interest is the length of the time span covered by the evaluations between the business receiving the assistance and the evaluation occurring.

At the outset of this study, there is concern that whilst evaluations of non-financial business support exist, these normally only cover a limited time span with the evaluation commencing within a year or two of the intervention. This view is supported by, for example, Chrisman, McMullan et al. (2005), who found “Most of the [outsider assistance] studies that have been done to date focus only on short-term, rather than long-term, impacts (...)”. Whilst there is often a desire for the effectiveness of a new scheme to be considered, there is a concern that it is too short a time period since the intervention and this limits the chance of the impact of any intervention to have been fully realised.

This argument is made by, for example, Lundström and Stevenson (2005) who stress the importance of taking into account any time-lag that may exist between an intervention and impact. Shapira (2001), considering manufacturing advice services in the US, is concerned that those advice services that would create longer term and less tangible results (such as training) would look comparably worse than those services that yield more immediate gains (e.g. the reduction of energy consumed), and, therefore, are sooner to observe and “more readily measureable”. The OECD (2007) also highlights this difference in time-spans between intervention and potential impact for the diverse forms of assistance.

A review of a decade of entrepreneurship policy in the Netherlands (EIM, 2009), and in particular entrepreneurship programmes at school, found that holistic and consistent evaluations for the programme are missing. It concluded the ideal scenario would be one where a longitudinal investigation would be conducted assessing “before and after the educational programmes”.<sup>7</sup>

Similarly, the earlier economic impact study of the English Business Link offer concluded that one of its two main limitations is its restriction to an 18-24 month period for impact assessment following the original intervention

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<sup>6</sup> Examples of financial support would include loan guarantee schemes, start-up funding (which may aim at particular industries or groups of society) and innovation support for particular technologies; examples of non-financial “soft” support would include business advice provision, training and education measures (e.g. to foster an enterprise culture).

<sup>7</sup> It is remarkable just how little reference to policy evaluation is made throughout the different sections of this EIM (2009) report, considering it’s a review of a decade of global entrepreneurship policy.

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(BERR, 2006). More than half of the firms surveyed for that study suggested that the benefits from the Business Link advice will occur beyond that timeframe, leading the authors to indicate that the true impact may have been understated in their study. Their recommendation, therefore, was to return to the sample to add longitudinal performance information at a later stage. This is a recommendation which we are able to action as a result of this feasibility study.

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### 3. Literature review

#### 3.1. Methodology

This research first undertakes a literature review to identify to what extent evidence on the long-term effects of non-financial government interventions in the small business policy area exists. The literature review was undertaken systematically using the following processes:

- A database search using common relevant search terms/keywords for the area of interest, including multiple combinations of “business support”, “non-financial”, “assistance”, “small firm”, “policy”, “advice centre”.
- An online search for relevant publications outside academic journals, specifically those of governments or other relevant bodies, such as the European Commission and OECD.
- A search combining above keywords with identified support scheme names. This was done for all international schemes considered in Mole and Bramley (2006), based on the assumption that those schemes considered at their time of writing would have existed sufficiently in the past for the long-term impact to have been reflected upon.
- An attempt to do the above steps in German language was also undertaken to partially negate the risk of all non-English language research being overlooked<sup>8</sup>.
- For any relevant longitudinal evaluations identified through the above steps, other articles cited in the paper were checked (on the assumption that the likely small number of long-term evaluations is likely to refer to the potential limited body of evidence existing).

As outlined above, most known UK evaluations for non-financial small firm support consider impact of schemes for up to 2 years after intervention. Therefore, in this report, we will consider studies as long-term that assess impact for at least 3 years after the original intervention. For comparison, and especially for methodological reasons, some research from outside the specific focus of non-financial assistance will then be reviewed.

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<sup>8</sup> This was done on the very pragmatic grounds of the German language skills within the research team.

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### **Review of the evidence of long-term evaluations of non-financial schemes**

Broadly, long-term evaluations of non-financial interventions for small firms were found to fall into the following broad categories – just as studies for short-term impact do:

- Qualitative – Survey of firms subject to intervention in the past with/-out control group
- Quantitative – Analysis based on firm performance data with/-out control group
- Quantitative – A combination of survey and firm performance data with/-out control group
- Other – i.e. the Dutch “policy theory evaluation”, as described below.

Evaluations can be of very different quality, so we will follow the OECD’s (2007) approach to use Storey’s (2000) “six steps” approach to judge the sophistication of an evaluation. These six steps can be summarised as follows: The initial three steps consider qualitative analysis, also described as “monitoring”, where Step 1 would be an analysis considering scheme take-up only, Step 2 would include recipients’ opinions, Step 3 their views on the assistance’s impact. With a view towards the quantitative element, referred to as “evaluation”, Step 4 then would include the use of control groups (to see how non-assisted firms fared by comparison), Step 5 a comparison with match firms and eventually Step 6 would be achieved by an evaluation that considers and allows for selection bias.

An example of a short-term study that would be categorised as a Step 2 (and rather weak) evaluation would be Kapareliotis and Zarkada (2012), who set out – among other things – to evaluate the impact of a female entrepreneurship training in Greece. The training programme is described as having been the foundation for a large-scale programme across the nation. Their evaluation entirely built on facilitators’ and participants’ feedback straight after course completion. No specifics were reported on most of their detailed evaluation objectives, including results against measures on “the degree to which female students could see themselves as potential entrepreneurs, having unique characteristics but being as competent as their male counterparts” and “[participants] attitude towards business ownership”. As such the difference the training made was not assessed (which would be Step 3).

By comparison, Cumming and Fischer (2012) conducted a far more robust assessment of the non-profit Innovation Synergy Centre in Markham. Founded in 2003 it provides a “one-stop shop” linking available advisory services of “experienced consultants and business professionals” with those seeking it, described as “senior managers of established businesses”. Expressly referring to Storey’s work (2000) on the Six Steps



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methodology, their research hypotheses were formulated to control for selection effects and the inability to determine the direction of causality between two variables such as innovation and exporting (i.e., endogeneity). As such, different models with Heckman's selection correction regression were run. Their findings indicate a significant link between hours of advice provided and sales growth (and success with obtaining financing), whilst the impact on patents and alliance formation appears more dubious after allowing for endogeneity.

Given the different levels of sophistication and accordingly potential value, when reviewing the (somewhat limited) existing evidence of long-term impact by non-financial schemes for small firms, particular attention was paid to those that would be considered as evaluations rather than monitoring studies, as defined above. Of particular interest were the methodologies applied by such evaluations, and the data they draw upon.

This is relevant, as there are other long-term impact reviews of policy in existence. An example would be a review of the Dutch SME and entrepreneur policy by Kuiper (2011), commissioned by EIM, spanning the 1982-2003 period, but designed as what the study refers to as "Policy Theory Evaluation". As such, whilst one of its objectives was to consider the effects of the policies during the given period, its approach is to determine the implied effects of the policy's "(implicit) assumptions", and to check whether they "are consistent with the formal policy objectives – that is, ends sought". Links between policy and the changes in the country's small business landscape are described, but no estimations provided. Rather, a link back to the anticipated policy effects is made to explain the shift in attitude. The study expressively points out the lack of certainty provided – "While a definite causal relationship cannot be proven, the policy shift probably did contribute to a definite change in perception of the public regarding the value of entrepreneurship and entrepreneurship as a valuable alternative to wage employment".



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### 3.2. Literature Review Findings

There were very few robust studies of the long-term impact of non-financial support programmes to small firms. Indeed, there was limited evidence of long-term impact studies of business support policies (including financial ones) among government sources and bodies such as the OECD and European Commission. One of the examples of how arbitrarily evaluation is often viewed within this “grey” literature is a report by EIM (2009), commissioned by the Dutch government, referring to the “positive evaluation” a Finnish entrepreneurship programme had received. It references a Finnish government report, not qualifying what had actually been evaluated. Reviewing the latter, the positive evaluation seems to entirely rest on the fact that more firms took up the offer of start-up financing assistance during the policy period reviewed (MTI, 2007). That may be positive, but fails to shed light on whether the policy is sensible and justified given its impact.

More recently, some more sophisticated reviews have been undertaken - for example, Gladys and Tan (2010) with their work for the World Bank, which provides a selection of impact evaluations of SME programmes, many with robust econometric methods. Long-term impact studies for financial support seem more popular with researchers because they would appear easier to measure. Despite this there are still few overall when considering the proportion of government spend dedicated to them.

Given the potential methodological relevance of these, a number have been included among the examples of long-term impact studies in Appendix A, where a range of schemes have been highlighted and the data and methodological approach outlined. All schemes highlighted were found to be of methodological relevance and can serve as a representative selection of appropriate case studies on the limited volume of literature available in this field.

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**Table 1 – Selected long-term evaluations**

Author(s)	Country	Evaluation timespan	Scheme type	Methodology Highlights	Key Findings
<b>Non-financial support schemes</b>					
Rotger, et al. (2012)	Denmark	7 years, ca. 4,000	Pre-start advice	Data-linking. Non-parametric approach and propensity scoring.	Scheme positive for survival, less pronounced so for growth
Wren, Storey (2002)	UK	2-8 years , 4,326 firms	Marketing advice	Extensive econometrics, selection issues tackled. Value for money estimations.	Results differ, highest positive impact found for 10-80 employee firms, with no impact for the smallest firms.
Chrisman, et al. (2005)	US	5-9 years, 159 start-ups	Pre-start advice	No control group, regression of hours of assistance and a number sales/employment growth controls. Selection issues tackled.	Significant impact of scheme, but diminishing marginal effectiveness with potential negative overall impact in case of too much assistance
Chrisman, et al. (2012, forthcoming)	US	5-7 years, 256 individuals	Counselling/ Education	Regression incl. hierarchal analysis	Entrepreneurship education has positive link to start-up rate, counselling impacts firm performance
Ministry of Economic Development (2009)	New Zealand	7 years, 1,130 participants	Not strictly non-financial: Funds provide to access expertise	Data-linking. Wide range of other support controlled for. Selection issues accounted for, difference-in-difference and propensity score matching.	All methods used suggest a generally positive impact on firm growth. One-off impacts observed.
<b>Financial support schemes</b>					
Norrman, Bager-Sjögren (2010)	Sweden	8 years, 603 (of which 510 assisted)	Start-up seed funding	Matched pair analysis. Results for each year post-intervention, providing impact profile	Only for few measures significant impact results. No additionality generated from scheme.
Criscuolo, et al. (2012)	UK	19 years, linked 40,000+ (final analysis for restricted years, reduces sample size)	Regional Selective Assistance programme	Micro data used for long-term impact estimation, use of Instrumental Variables to account for selection of underperforming firms. Value for money.	Scheme effective for smaller firms, no effect on firms with more than 150 staff.
Almus, Prantl (2001)	Germany	6-9 years, 12,000 firms	Broad financial support	Half yearly data 1990-1993 with 1999 follow-up survey. Firm matching and propensity scoring to address selection/for control reasons.	Overall positive scheme impact, including better survival chances.
<i>More details and further evaluations (less advanced as measured by the Six Steps framework) in Appendix A.</i>					

## 4. Feasibility of assessing the long-term impact of Business Improvement Services

### 4.1 Methodology for Long-Term Evaluation

The approach for this feasibility study is to link **a single business support product**, Business Link (BL) – to the ONS Business Structure Database (BSD), which is the business demography version of the UK Inter-Departmental Business Register (IDBR). This will facilitate an analysis of survival and growth of recipient businesses in the post-assistance period<sup>9</sup>. The following section first explores the data already at hand about firms that have received support from Business Link, some limitations that may stem from the use of it and the sub-sample of firms to be used for this analysis, before considering the technicalities around linking the survey firms to the BSD.

It should be reiterated that this report is not a formal evaluation of the BL scheme, however its empirical findings will be of interest to policy makers and those with an interest in the effectiveness of Government SME policies. The decision to use BL to explore longer term outcomes was driven by the availability of data, with the existence of a large scale and detailed evaluation questionnaire survey containing information on businesses that received BL assistance in 2003, as well as a comparison group of businesses that did not receive support.

#### 4.1.1 Data - BLO Survey

The respondents to the Business Link Operator (BLO) Economic Impact Survey in 2005 (the BLO survey) provide the data used in this study and was published as the official evaluation study a year later (BERR, 2006)<sup>10</sup>. Mole et al., (2008) provide a synopsis on the nature of the data, summarised here to provide an understanding of the dataset.

A structured survey was conducted by telephone with SMEs who had received Business Link assistance between April and October 2003. The interviews took place during the spring of 2005, with most responses being by either owner-managers or firm-managing directors. The group of firms to be included in the study was provided by the Business Link Operators (BLOs). Similarly, a control group of non-assisted firms was also surveyed, the sampling frame drawn from the Dun & Bradstreet UK database, and respondents were asked to confirm that they had not received any Business Link assistance during the period of April to October 2003. The

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<sup>9</sup> See also Norrman and Bager-Sjögren (2010), who provide a rare example of estimating scheme impact over multiple years for each post-intervention year, albeit with limited evidence regarding impact.

<sup>10</sup> See also Mole et.al., (2008; 2009; 2011 and 2014)

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assisted firms were classified in “intensive” (IA) or “non-intensive” assisted (i.e., ‘Other Assistance’ OA), the categories defined by Business Link. Intensive assistance would usually have stretched over several months and a number of interactions between SMEs and Business Link, probably featuring an action plan and the use of external consultants. In comparison, ‘other’ assistance is more likely to be a “one-off” interaction by phone. The survey was undertaken in CATI and highly structured. Of those surveyed, 44% were intensively assisted (IA), 36% had received ‘other’ assistance (OA).

### **4.1.2 Data: Business Structure Database (BSD)**

The Business Structure Database (BSD) contains annual snapshots of the Inter-Departmental Business Register (IDBR). The IDBR includes nearly all of UK’s businesses registered with the HMRC for VAT and/or PAYE purposes. The only exclusions are very small businesses: those that fall below the VAT threshold of currently £73,000 annually and/or those that are not part of PAYE (weekly salaries less than £107 [2012-13 tax year]). This is in contrast to the alternative Annual Respondents Database (ARD), which would provide a wide range of data on firms, but includes few smaller firms (see below).

The IDBR is a “live” database where data gets updated as it becomes available, from sources such as HMRC (VAT and PAYE participants information), and Companies House, among others. The BSD in turn provides a static (snapshots of the ‘live’ IDBR taken in March of each year) but, of course, longitudinal view when these annual datasets are linked together. Compared to other data available on firms, it includes relatively few variables (but for nearly all firms, other than any of the other datasets available). Evans and Welpton (2009) provide a detailed explanation of the BSD.

### **4.1.3 Data: Annual Respondents Database (ARD)**

The ARD is created by adding the Annual Business Survey (ABS) data each year (formerly the Annual Business Inquiry [ABI], prior to 1998 ABI’s predecessor surveys were used) – hence creating a longitudinal dataset. Oulton (1997) provides a view on the set up of the ARD. It captures various business activity indicators, including sales and employment, the focus of this feasibility exercise. One potential limitation may arise from the way the ABS and its predecessors were conducted – whilst all of the largest businesses are included in the sampling frame, progressively fewer businesses are included as business size reduces. The value of the ARD remains untested in this feasibility study for the reasons indicated in footnote 3.

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### ***4.1.4 Data-Linking – adding the longitudinal dimension***

As described above, the approach for this feasibility study is to link the firms from the BLO Economic Impact Survey to the BSD. Guided by Hart and Bonner's work (2011), who provide a comprehensive summary of basic principles for data-linking, the preparation for the linking exercise involved the following:

A common identifier across the datasets to be linked is required. This could be the business' name and postcode; however, this would add complexity at the linking stage as it would require the use of additional algorithms to match the data. Therefore, the FAME database was used to identify firms' company registration numbers (CRNs) – see below. This provides a common referencing number across the datasets involved.

With the use of CRNs as the unique identifier, data was matched at firm-level within the ONS BSD database. From reviewing the survey entries and survey methodology, it is a viable assumption that most assistance would have been recorded at the firm rather than plant level. It should also be noted that many of the firms surveyed were single entities, so that the distinction between firm and plant level would not be an issue for data-linking purposes. Annual sales and employment figures from the BSD will be used for a surviving panel of firms in the original BL evaluation study. As a check, matched firms will have their size (sales/employment) compared to what was originally reported in the survey (where available). This way any issues with the linking process can be easily detected and addressed.

### ***4.1.5 BLO Survey Sample adjustments – in preparation for data linking***

Only 1,306 of the 3,448 firms included in original BL survey dataset agreed for their firm data to be used in further research, and of that subgroup company register numbers (CRNs) could be identified for only 693 of them through the FAME company database. An appropriate split between the three categories of assistance remains: Of the 693 firms 251 had received intensive assistance, 225 other assistance and 217 firms formed the control group. Hence, for the purpose of this feasibility study, these 693 firms were linked to the BSD for a longitudinal analysis of their performance.

### ***4.1.6 Potential issues with data***

Some level of caution is appropriate with the use of the identified sub-sample of 693 firms. Only companies are registered on the FAME database. Sole proprietorships and partnerships are excluded, which means the characteristics of selected companies may differ to the actual underlying population of BL recipient businesses. It is likely that those firms not included on FAME will be mainly those not registered for VAT

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and/or PAYE, that is, very small firms. BL advice has been used by many very small businesses, and so the 693 firms used for this feasibility study might be expected to be of greater size than would be representative of the overall sample. To understand the potential differences between the overall and the 693-firms-subsample, Tables 2-4 provide the summary of the relevant test statistics comparing the means of a number of company descriptors. That is, for those of the 1,306 agreeing to have their data linked to official government datasets and the 693 (of the 1,306) that FAME returned a CRN for – split into three tables: For Intensively Assisted firms (Table 2), Other-Assisted (Table 3) and the Non-Assisted control group (Table 4).

A number of differences between the overall sample and the defined sub-samples are evident. However, whilst average firm size (as measured by number of employees and turnover) is clearly larger for the 693 firms sub-sample across all three tables, the mean variation is only found to be significant for the control group (Table 4). So despite the CRNs only having been identified for firms included in FAME, and as such generally larger, the group of assisted firms included for this feasibility study is not significantly different in size compared to the original sample. The control group, however, is (at the 10% level) comprised of larger firms compared to the original sample of controls and this difference is significant.

Other than size, a number of other company descriptors differ significantly (at least at the 10% level) between the compared groups. Significant differences across the two types of assistance and the control group exist in the proportion of firms making use of business plans – a higher proportion for the 693 firms sub-sample. For both intensive-assisted firms (Table 2) and the control group (Table 4) the mean variation is significant at the 1% level, for the non-intensive assisted firms the variation in the average of firms having a formal business plan is significant at the 5% level, with the absolute difference between the sample of firms agreeing to further research and those that a CRN could be identified for at between 6.7 to 8.9 percentage points – whilst the firms agreeing to further research are already more likely to have a business plan than the original sample of the 3,448 firms.

Along with possession of a formal business plan, the 693 firms to be used for the feasibility analysis are significantly more likely to be exporting (at 1% level), with 7.6 to 9.7 percentage points difference between the group of firms agreeing to be included in the research (i.e., the 1,306) and the 693 firms for both types of assistance and the control group. However, only a relatively small difference exists between the original sample and the sample of firms agreeing to participate in further research by having their data linked to official government datasets.

Also highly significant (at 1% level) across all three groups of assisted firms and the control group is the variation in the number of firms operating as a limited liability company. For the sub-sample of 693 firms this is some 20



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percentage points higher for both types of assisted firms, and 27.8 percentage points higher for the control group. Again, only a marginal difference can be observed between the original sample and the sample of firms agreeing to further research.

The average proportion of female directors on the board also shows significant variation across the three groups (at 5% level for the control group, 10% level for the assisted groups), with their proportion being lower for the sub-sample of 693 firms than in the original sample. At the 5% level there is also a significantly higher proportion of serial entrepreneurs in the group of other-assisted firms.

Ultimately, industry sector dummy variables show some significant mean variation. Across both types of assistance and also the control group, there is a pronounced and highly significant (at 1% level) decline in the proportion of firms in the agricultural sector, from around 10-11% of the sample in the original population down to around 2-3% of firms in the sub-sample of 693 firms. For the intensive-assisted firms and the control group there is very little difference between the original sample and those that agreed to further research. It is the difference between the 1,306 firms and the 693 firm sample that is significant.

Likewise, and in the opposite direction, significant differences are observed in the share of manufacturing firms, albeit at significance levels at either 5% (for non-intensive assisted firms and the control group) or 10% (for the intensive assisted firms). The sub-sample of 693 firms has a 6 to 7 percentage point higher share of manufacturing firms across both types of assistance and the control group than in the original sample.

So while the larger firm size in the 693 firms sample was not found to be of significance for the two types of assistance, the obvious tendency for FAME to exclude micro firms (and as such with an identifiable CRN for this feasibility study) does favour manufacturing firms over agricultural enterprises, which tend to be smaller than their manufacturing counterparts.

The remaining variations in means were found for the intensive-assisted group, with a far higher proportion of business services firms and a lower share of firms in the health sector in the sub-sample of 693 firms than in the original sample and the sample of firms agreeing to further research (at 5% level). At the 10% level, there is a significant variation in the share of health sector firms, with the sub-sample of 693 firms having a smaller share of such firms.

In essence, the sub-sample of 693 firms in the feasibility study shows some significant variations from the original full sample and the intermediate sample of firms agreeing to further research. The 693 firms display some characteristics of more mature organisations, such as a higher likelihood of

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a formal business plan being in place and a stronger export-orientation. They are also more likely to choose to trade as a limited liability firm.

As expected due to the fewer number of micro-firms in the FAME database, there seems to be a trend for firms to be larger on average in the sub-sample of 693 firms. However, this variation was found to be significant only for the control group of firms. The significant variations among the sector shares, particularly the reduced number of (assumed to be smaller) agricultural firms and a higher proportion of (assumed to be larger) manufacturing firms appear to support this.

Concluding, it is clear that the sub-sample of 693 firms is not fully representative of the full sample of 3,448 firms from the original survey, and that selection error is introduced on top of any selection bias that the original survey sample may already have been subject to. However, the econometric approach (a standard Heckman selection model) will control for any of the differences we have discussed above between the three groups.

For the purpose of this feasibility study this is not of immediate concern, as the primary interest is to demonstrate the value of using existing datasets for longitudinal evaluations through data-linking and not to re-run the evaluation of Business Link. By constraining the initial short-term analysis to the 693 firms with a CRN number, comparisons between the short-term and the long-term will provide valuable methodological insights, with a sensitivity analysis adding to the understanding of when growth occurs in the post-assistance period.

A possible enhancement to help avoid the issues presented above would be to use an alternative data-linking methodology that does not rely on a simple match to FAME to obtain a CRN common identifier. Using matching algorithms for firm-name and postcode would yield a higher degree of matching but would have taken much longer and have incurred an additional resource which was outside the scope of this feasibility study.



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**Table 2 – Summary statistics for intensive assistance**

<u>Comparing means of ALL firms, Firms AGREEING to inclusion in research, and agreeing firms with CRN match</u>									
<u>By Type1 (Intensive assis.)</u>									
	ALL ø	S.D.	Agree ø	S.D.	CRN ø	S.D.	F	χ <sup>2</sup>	
							Anova	Pearson	p
									Sig.
Employ. '05	28.872	86.597	25.000	49.767	32.915	60.163	0.9		0.405
Turnover '05	3043	10108	3431	13033	3997	10978	0.5		0.604
Age 3<4 yrs.	0.061	0.239	0.070	0.255	0.076	0.266		0.tab	0.611
Age 4<5 yrs.	0.079	0.271	0.090	0.286	0.100	0.301		type986	0.524
Age 5<1- yrs.	0.194	0.395	0.191	0.393	0.216	0.412		1.292	0.686
Age 10<20 yrs.	0.244	0.430	0.242	0.429	0.212	0.410		0.754	0.558
Age 20+ yrs.	0.305	0.461	0.274	0.446	0.272	0.446		1.165	0.337
Business Plan	0.628	0.484	0.698	0.460	0.771	0.421		2.173	0.000 ***
Multi.Sites	0.193	0.395	0.177	0.382	0.175	0.381		21.715	0.667
Exporting	0.250	0.433	0.267	0.443	0.364	0.482		0.811	0.001 ***
Ltd. Liability	0.682	0.466	0.678	0.468	0.884	0.320		13.471	0.000 ***
Owner Age 25-34	0.080	0.272	0.073	0.260	0.075	0.263		43.572	0.000 ***
Owner Age 35-44	0.288	0.453	0.304	0.461	0.349	0.478		0.289	0.185
Owner Age 45-54	0.372	0.484	0.365	0.482	0.353	0.479		3.378	0.857
Owner Age 55+	0.257	0.437	0.255	0.437	0.220	0.415		0.310	0.486
Serial Entrepr.	0.390	0.488	0.404	0.491	0.415	0.494		1.445	0.723
% Female Dir.	27.979	33.041	31.061	34.696	25.362	31.827	2.49	0.650	0.084 *
Agricultural	0.117	0.321	0.110	0.313	0.024	0.153		19.651	0.000 ***
Construction	0.081	0.272	0.083	0.276	0.108	0.310		1.966	0.374
Education	0.019	0.135	0.022	0.148	0.012	0.109		0.956	0.620
Finance	0.009	0.094	0.009	0.094	0.012	0.109		0.223	0.895
Health	0.068	0.252	0.072	0.258	0.032	0.176		0.223	0.895
Estate	0.254	0.435	0.253	0.435	0.339	0.474		5.078	0.079 *
Manufacturing	0.188	0.391	0.188	0.391	0.247	0.432		8.028	0.018 **
Retail	0.135	0.341	0.125	0.331	0.124	0.330		4.725	0.094 *
Social Serv.	0.052	0.223	0.049	0.217	0.044	0.205		0.374	0.829
Transport	0.030	0.171	0.036	0.186	0.032	0.176		0.318	0.853
								0.340	0.844

\* sig. at 10% level  
 \*\* sig. at 5% level  
 \*\*\* sig. at 1% level

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**Table 3 – Summary statistics for other assistance**

<u>Comparing means of ALL firms, Firms AGREEING to inclusion in research, and agreeing firms with CRN match</u>										
By Type2 (Other assis.)										
	ALL ø	S.D.	Agree ø	S.D.	CRN ø	S.D.	F	χ <sup>2</sup>	p	Sig.
							Anova	Pearson		
Employ. '05	41.144	427.510	67.966	707.624	107.780	952.701	1.3		0.272	
Turnover '05	5105	25109	7859	36495	10655	45974	1.22		0.295	
Age 3<4 yrs.	0	0	0	0	0	0		0.772	0.680	
Age 4<5 yrs.	0.063	0.243	0.070	0.255	0.067	0.251		0.238	0.888	
Age 5<1- yrs.	0.168	0.374	0.173	0.378	0.161	0.369		0.132	0.936	
Age 10<20 yrs.	0.272	0.445	0.261	0.440	0.305	0.461		1.434	0.488	
Age 20+ yrs.	0.340	0.474	0.317	0.466	0.332	0.472		0.759	0.684	
Business Plan	0.550	0.498	0.588	0.493	0.655	0.477		8.850	0.012	**
Multi.Sites	0.198	0.399	0.189	0.392	0.231	0.422		1.731	0.421	
Exporting	0.203	0.402	0.224	0.418	0.307	0.462		11.931	0.003	***
Ltd. Liability	0.606	0.489	0.628	0.484	0.844	0.363		46.906	0.000	***
Owner Age 25-34	0.095	0.293	0.117	0.322	0.101	0.303		1.477	0.478	
Owner Age 35-44	0.273	0.446	0.249	0.433	0.280	0.450		1.026	0.599	
Owner Age 45-54	0.357	0.479	0.343	0.475	0.333	0.473		0.539	0.764	
Owner Age 55+	0.271	0.445	0.287	0.453	0.280	0.450		0.365	0.833	
Serial Entrepr.	0.350	0.477	0.409	0.492	0.438	0.497		8.130	0.017	**
% Female Dir.	26.655	32.470	28.412	32.616	22.412	27.541	2.56		0.077	*
Agricultural	0.105	0.307	0.076	0.266	0.027	0.161		15.524	0.000	***
Construction	0.087	0.281	0.081	0.273	0.111	0.315		1.760	0.415	
Education	0.014	0.116	0.014	0.119	0.009	0.094		0.384	0.825	
Finance	0.007	0.083	0.005	0.069	0.009	0.094		0.403	0.817	
Health	0.059	0.236	0.074	0.262	0.053	0.225		1.488	0.475	
Estate	0.264	0.441	0.279	0.449	0.289	0.454		0.785	0.675	
Manufacturing	0.194	0.395	0.200	0.401	0.267	0.443		6.205	0.045	**
Retail	0.149	0.356	0.153	0.360	0.151	0.359		0.031	0.984	
Social Serv.	0.046	0.210	0.050	0.218	0.036	0.186		0.725	0.696	
Transport	0.022	0.148	0.026	0.160	0.027	0.161		0.302	0.860	

\* sig. at 10% level  
 \*\* sig. at 5% level  
 \*\*\* sig. at 1% level

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**Table 4 – Summary statistics for non-assisted firms**

<u>Comparing means of ALL firms, Firms AGREEing to inclusion in research, and agreeing firms with CRN match</u>										
By Type3 (Control - non-assis.)										
	ALL ø	S.D.	Agree ø	S.D.	CRN ø	S.D.	F	χ <sup>2</sup>	p	Sig.
Employ. '05	23.863	75.829	20.652	34.272	32.385	43.511	2.37		0.094	*
Turnover '05	4077	18156	5249	23492	8664	30702	1.88		0.153	
Age 3<4 yrs.	0.035	0.184	0.037	0.188	0.032	0.177		0.788	0.961	
Age 4<5 yrs.	0.048	0.214	0.059	0.237	0.055	0.229		0.896	0.639	
Age 5<1- yrs.	0.144	0.351	0.155	0.363	0.166	0.373		0.835	0.659	
Age 10<20 yrs.	0.239	0.427	0.265	0.442	0.253	0.436		1.162	0.559	
Age 20+ yrs.	0.459	0.498	0.429	0.496	0.452	0.499		1.099	0.577	
Business Plan	0.322	0.468	0.363	0.481	0.452	0.499		13.582	0.001	***
Multi.Sites	0.155	0.362	0.148	0.355	0.212	0.410		5.030	0.081	*
Exporting	0.152	0.359	0.167	0.373	0.243	0.430		10.882	0.004	***
Ltd. Liability	0.536	0.499	0.533	0.499	0.811	0.392		59.290	0.000	***
Owner Age 25-34	0.065	0.246	0.076	0.266	0.074	0.262		0.707	0.702	
Owner Age 35-44	0.276	0.447	0.274	0.446	0.320	0.468		1.786	0.409	
Owner Age 45-54	0.328	0.470	0.343	0.475	0.335	0.473		0.287	0.867	
Owner Age 55+	0.321	0.467	0.290	0.455	0.251	0.435		4.416	0.110	
Serial Entrepr.	0.271	0.445	0.287	0.453	0.289	0.454		0.586	0.753	
% Female Dir.	26.361	33.486	28.536	34.155	21.694	28.782	3.00		0.050	**
Agricultural	0.111	0.314	0.100	0.300	0.032	0.177		12.742	0.002	***
Construction	0.083	0.277	0.080	0.271	0.101	0.303		0.959	0.619	
Education	0.010	0.097	0.014	0.116	0.014	0.117		0.660	0.719	
Finance	0.015	0.121	0.018	0.134	0.014	0.117		0.289	0.865	
Health	0.059	0.236	0.068	0.252	0.055	0.229		0.598	0.742	
Estate	0.149	0.357	0.132	0.339	0.134	0.341		0.976	0.614	
Manufacturing	0.180	0.384	0.170	0.376	0.249	0.433		6.673	0.036	**
Retail	0.240	0.428	0.250	0.434	0.253	0.436		0.268	0.874	
Social Serv.	0.047	0.211	0.061	0.240	0.078	0.269		4.115	0.128	
Transport	0.028	0.164	0.027	0.163	0.023	0.150		0.156	0.925	

\* sig. at 10% level  
 \*\* sig. at 5% level  
 \*\*\* sig. at 1% level

A number of further considerations need to be kept in mind when working with this dataset. The most important is one of contamination of the sample groups. The survey covered only a half a year period of BL assistance in 2003. Some firms that received business advice in later years may have been impacted by the business advice but will, by definition, be grouped as non-assisted in this analysis (and if so, may serve to bring the non-assisted and assisted firm growth dynamics closer together). Further, attempting a longitudinal analysis in this study, the risk of other business improvement schemes having had an impact on firm performance in the post-2005 period is also a strong possibility. We have no way of controlling for that in this feasibility study.

## Feasibility Study – The Long-Term Impact of Business Support

### 5. Impact of Assistance - analysis post data-linking

#### 5.1 Introduction

Of the 693 firms that a CRN number was identified for, more than 80% of them could be linked to the BSD. Of these 565 entities, 345 firms were still in business in 2010. Of the 345 survivors, 135 were intensive assists (IA), 105 other assists (OA), with a non-assisted control group (NA) of a further 105 firms.

Figure 1:

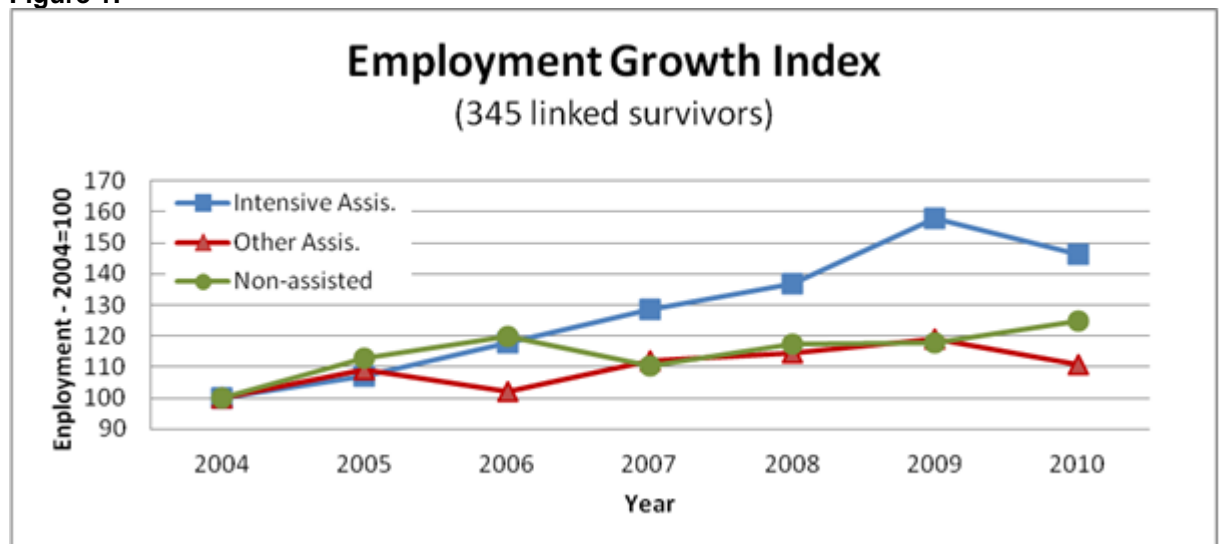
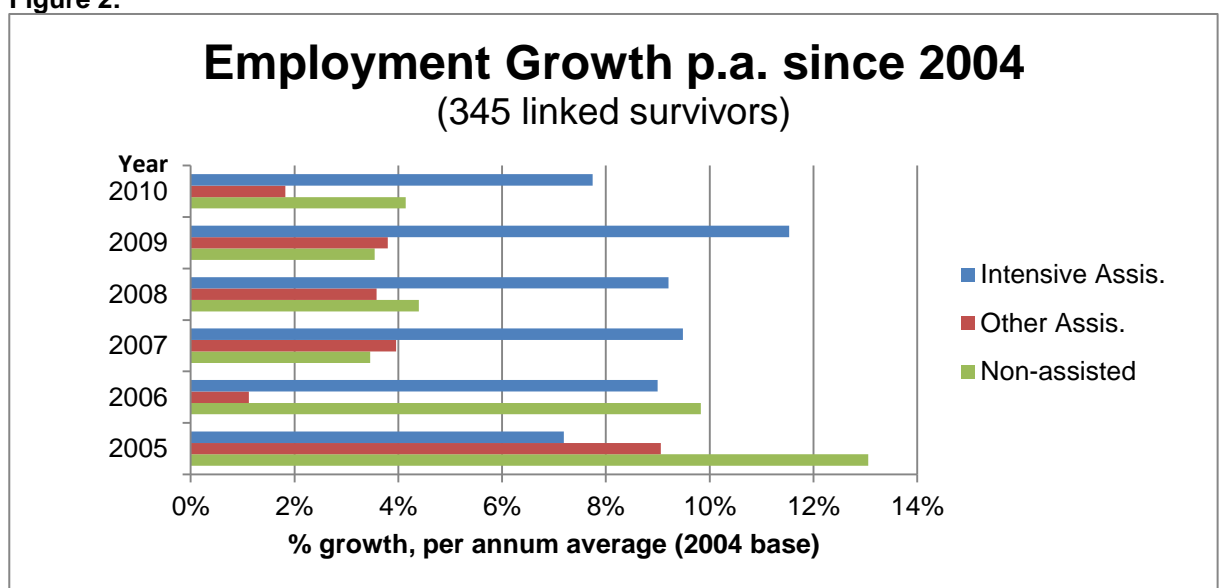


Figure 2:



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Some initial high-level analysis of these survivor groups points to markedly different growth behaviour by the IAs compared to the other two firm groups in the post-assistance period (Figures 1 and 2). One key observation is that within the first three years from the date of intervention in 2003 to 2006 IAs and Non-assisted businesses (NAs) show reasonably similar growth trends overall, whilst OAs experience a marked dip in terms of employment growth, with only around 1% total employee growth 2004 to 2006. This compares to around 9% for the one year 2004 to 2005.

From 2007 onwards the IAs outperform both OAs and NAs – initially due to roughly keeping their 2004-2006 annual growth rate, before a considerable increase from 2008 to 2009, with a subsequent drop in staffing levels in 2010. This compares to the NAs dropping to an overall growth rate comparable to that of the OAs in 2007, with the interesting difference that only NAs experience growth from 2009 to 2010, whilst IAs and OAs both see a similar percentage drop in employee levels (albeit from a considerably higher index level for IAs).

Annualised, for the period of 2004 to 2010, IAs experienced an average of 7.8% p.a. growth in employment, OAs of 1.8% p.a., with the latter outperformed by NAs which saw their staff levels grow by 4.1% p.a..

### 5.2 Reliability of self-reported data?

An interesting observation can be made by comparing the BSD employment data with the self-reported data contained in the 2004 BLO Economic Impact Survey (which was used for 2004 to 2005 growth analysis) for the 345 linked survivors. There appears to be some variation between the evaluation survey responses and BSD data. This is perhaps not surprising due to the timing issues inherent in the BSD data.

**Table 5: Comparison of Employment Data by Source**

	BLO Survey data			BSD data		
	2004	2005	Δ	2004	2005	Δ
<b>Intensive Assists (IAs)</b>	4272	4681	9.57%	3490	3741	7.19%
<b>Other Assists (OAs)</b>	3762	3916	4.09%	3611	3938	9.06%
<b>Non Assists (NAs)</b>	3110	3117	0.23%	2980	3369	13.05%

Source: ONS BSD; BLO Economic Impact Survey

Some of the variation between BLO Survey and BSD numbers will come from the differently timed points of measurement for annual employment figures held by the IDBR and some inherent inaccuracy when asked to provide employment figures ad-hoc over the telephone. Whilst the BSD is based on an extraction from the IDBR in March of each year it is not the case that all the employment data refers to that month and indeed some of it could refer to some months prior to this. The table should, therefore, be

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read with some encouragement in that the respondent's answers are not widely different from what is held on the BSD. In any data-linking exercise no administrative dataset perfectly reflects the actual position in a firm on a particular date or period.

However (considering that the BLO survey was carried out in 2005, and therefore 2004 data provided by firms was for their previous business year), IAs have provided much higher employment figures for both years in question than the BSD would now indicate. Compared to that, the OA BLO Survey figures show very little deviation from the rough overall employment levels on record in the BSD, but still resulting in an actual employee growth rate less than half of what the BSD would suggest. However, the observed difference for the control group (NAs) is more marked – whereas the survey figures suggest hardly any growth, the BSD data points towards employee growth of 13% in the 2004-2005 period.

### 5.3 Econometric Analysis

Econometric techniques are used to assess scheme impact, by controlling for differences in business characteristics as well as factors affecting take-up of the scheme. As highlighted earlier, the sample group of assisted firms is significantly different from the comparison group of non-assisted firms. The use of the 2-stage Heckman model enables us to incorporate these differences in the estimation of impact for the assisted firms within the reduced sample of firms that survived the 2004-10 period.

Following the analysis applied in the BERR (2006) impact study, which adopted a two-stage Heckman model, the first stage is the development of a series of probit models to ascertain the probability of receiving assistance (for the full probit and regression results of the BERR impact study please refer to the tables in Appendix B). Appendix C contains the tables with the new econometric results based on the longitudinal linked data. Two probit regressions were run (Table C1), with the same model specification as in the BERR study.

Despite the much smaller number of observations involved (compared to the BERR study) and the observed inconsistencies for firm size between the BLO survey data and the BSD, the probit models performed well and are, at large, in line with expectations based on previous results.

In both the IA (model 1) and OA (model 2) models some changes to the sign of coefficients have occurred (compared to the BERR study). However, all of those coefficients are insignificant at the 5% level and the coefficient for multi-plant firms would be the only significant one to have changed sign for model 1 (at the 10% level). In the original BERR models this coefficient was not found to be of significance for either the IA and OA models. A number of further coefficients have become significant - namely, for firms aged 4 to 5 years (model 1 and model 2); firms aged 5 to 10

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years; introduction to BL by mailshot and introduction to BL through their website, as well as for two of the sector dummies.

Coefficients that now appear insignificant but were not so in the original models include the indicator for limited liability status (which in model 2 has also changed sign), and notably the BL contact and BL friend referral variables for the IA estimation (model 1). There were also some shifts from significance to insignificance for the sector controls.

Hence on the basis of the small linked sample some variation in the significance of single coefficients has occurred. Therefore, two important points should be noted: although the linked sample is not representative of the larger original sample in its entirety it still provides a good proxy for the type of analysis presented here. However, in turn it underlines that this report **is merely intended as a feasibility study as a proof of concept, and that the results are based on models at the margin of acceptability given the range of variables included. In other words it is our view that a sample size of ~100 respondents from each of the sample groups represents the minimum acceptable. We achieve this despite the attrition involved since the original study.**

Notwithstanding these caveats, the impact of BL assistance is then estimated in Ordinary Least Square (OLS) models, with employment, turnover and productivity (turnover per employee) growth as respective dependent variables. Following the same model specification as in the BERR report, the models are in semi-log form given the skewed distribution of growth rates. As such, a unit increase for a continuous variable represents a percentage point increase in the growth rate, which is 100 times the coefficient. For the dummy variables (with values of either 0 or 1), 100 times the coefficient reflects the percentage point increase in the growth rate due to moving from a value 0 to value 1. Selection effects were found to be insignificant and, therefore, the OLS models without selection effects are reported.

The employment, turnover and productivity growth models have all been run multiple times, for both types of assistance, to provide an understanding of the potential changes in significant impact of the assistance received over time. Tables C2 to C7 (Appendix C) detail the model results for the impact of the respective type of assistance on growth for the periods 2004 to 2005, 2004 to 2006, and continuing up to 2004 to 2010.

The coefficient for intensive assistance (Table C2) is found to be positively related to employment growth (at the 10% level) for each period assessed, except for the initial 2004 to 2005 period, where the coefficient takes a negative sign and is insignificant (in the BERR impact study, this was the only period assessed but returned a significant positive result). The 2003 intervention yields its highest measured impact for the time periods to 2009 and 2010 when intensive assistance increased the employment rate by about 24.5 percentage points, compared to the 2004 to 2006 period where



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this additional impact was still an impressive 20.4% (i.e., one additional year compared to the original evaluation study). **These results suggest that there may indeed be a time lag that is longer than the estimated short-term effects of interventions.**

The impact of other assistance (Table C3) on employment growth was not found to be significant for any of the evaluated time periods, however, the OA coefficient gradually gets stronger the longer the period suggesting again that the realisation of the beneficial impact of assistance received seems to be a longer and more gradual process than most evaluations allow for.

The results of IA and OA on turnover growth are interesting (Table C4 and Table C5). The coefficient for IA is rather weak for the 2004 to 2006 period and even negative for the estimation of the initial one year period 2004 to 2005, and insignificant. Only in the fourth post-intervention year (for the 2004 to 2007 period) does the coefficient markedly strengthen, and becomes significant (at the 10% level) for the 2004 to 2008 period, with a 32.6 percentage point impact on turnover growth. It then declines for the longer assessed periods, but still with a relatively strong coefficient compared to the first three post-intervention years. This is an important finding as the original evaluation found no short-term impact on output.

OA's impact on turnover growth shows the same upwards trend over time as IA, however, its highest (and at the 10% level significant) impact can only be measured for the seven year period up to 2010, with a similarly remarkable strengthening of the coefficient between the 2004 to 2006 and 2004 to 2007 periods. Significant results (at the 10% level) were returned for the period of 2004 to 2007 and 2004 to 2010, where OA added 22.7 and 34.6 percentage points respectively to turnover growth.

For productivity growth effects Table C6 and Table C7 provide a very mixed picture of the impact of the assistance received. The proxy for productivity applied is a turnover/ employee ratio, which may explain some of the mixed results for this measure of growth. For example, a fast growing firm adding staff will inevitably often see a productivity drop before the additional staff can be translated into higher sales.

The longer time period now takes us into the economically challenging period of 2008 and 2009, and as such attention should be paid to the likely effects on the results. Figures 1 and 2 (above) showed a marked contraction of employment for both IAs and OAs from 2009 to 2010. At an aggregate UK level, businesses larger than ten employees had broadly a similar annual job gains/losses ratio for the periods 1998-2010 and 2009-2010, whilst those with one to nine employees saw a considerable rise in new jobs created – with an even bigger rise in jobs lost (BIS, 2011). The underlying sample used for the above feasibility analysis had an on average larger business size than the original sample, which could lead to an underestimate of the long-term effects of assistance. This highlights an



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important point about the development of a long-term evaluation methodology which short-term evaluations do not have to deal with – namely, the macro context and the importance of the introduction of a time series dimension into the econometric analysis.

## 6. Conclusions and Recommendations

Despite the caveats noted, this feasibility study has demonstrated it is possible to look at the impact of business improvement schemes over a longer number of years. The 2005 BLO evaluation survey sample has reduced dramatically before the BSD data was eventually linked, resulting in the observed variation in coefficients' strength and occasionally even their sign when comparing this reduced linked sample to the original BERR impact study (2006). The impact coefficients in the final regressions for a longer time period are far stronger than those reported in the original evaluation study – by a factor of 10.

The original study also reported a significant positive impact of intensive assistance (IA) for the immediate post-intervention period of 2004 to 2005 for the self-reported employment figures, something we could not find on our reduced sample and BSD employment data. Also, no attempt has been made at understanding what environmental factors may have benefitted the faster growing assisted firms. For example, it would seem plausible that some form of further business support may have been taken up by some firms given the time span studied, which may be a better explanation for some or all of the additional growth rather than the initial Business Link intervention.

But, what this feasibility study does show is that **the time horizon most evaluations of business improvement services apply is far too short**. There are strong suggestions from this report's analysis that impact develops over a time span that exceeds the usual two year post-intervention evaluation window. Our analysis shows a clear time-lag prior to the intensive assistance impacting staffing and sales levels, possibly as businesses are putting in place the various strategic elements necessary for growth<sup>11</sup>.

Our recommendation would be to ensure a strategic evaluation of impact to occur far later than currently practiced. The impression from this feasibility would be to allow at least 3 years for a strategic evaluation<sup>12</sup>. However, the longer the evaluation period, the more important it will be to account for other events and interventions that may impact business performance (e.g., other support schemes and indeed the economic cycle). In addition to the empirical results, it is evident that there is only very sparse literature on the longer term impact of support in an empirical manner (despite making

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<sup>11</sup> This is a well-known phenomenon known as the "j curve effect" affecting venture capital funded companies who may experience rapid growth following a period of static or even negative growth immediately following investment

<sup>12</sup> It is difficult to pin-point an exact period of years needed based purely on this initial feasibility report, given its discussed limitations. More work will be required to understand, for example, the impact of, and how to control for, other interventions received - an issue increasingly important the longer the assessment period.

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expressive reference to the need for longer term evaluations in some cases). Therefore, the UK is not alone in not measuring the longer term impacts of business support policies.

Our recommendation, therefore, must be to undertake further efforts to explore these benefits. We recommend undertaking a study with a larger underlying firm universe which captures ALL firms in receipt of assistance and linking them at the outset to the relevant administrative datasets. An obvious next step would be to ensure that all government-funded programmes and schemes are linked to control for other forms of assistance received by beneficiary firms going forward. Such a dataset could also be linked to other business survey datasets to obtain a range of additional variables (e.g., R&D expenditure; export sales, GVA) to enable a richer form of analysis (e.g., PSM to more effectively derive appropriate control groups). At the time of writing this is indeed a project being taken forward by BIS and other partners such as Innovate UK.

Bespoke evaluation surveys will continue as policymakers and ministers seek to establish the benefits of intervention in the short-run. For national programmes such as Growth Accelerator they should be large enough to ensure that the attrition effects do not render long-term impact assessments impossible. In this case an original sample of ~3,500 was only just about able to provide a long-term impact assessment.

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### **APPENDIX A: Synopses of Selected Long-Term Business Support Studies**

#### **Non-financial support schemes**

**Denmark: Guided Preparation – “Assessing the effectiveness of guided preparation for new venture creation and performance: Theory and practice”. Timeframe: 7 years.**

This study by Rotger, Gørtz et al. (2012) is of note due to its evaluation of “guided preparation” (e.g. mostly preceding firm creation) support in the Danish North Jutland region, a practice that the authors consider widespread across the developed nations. Data linking is used to base the analysis on a longitudinal dataset, combining captured data on the programme’s participants 2002-2006 with firm descriptives (incl. performance data i.e. sales and employee numbers) from governmental sources for 2001-(mostly) 2007.

A non-parametric approach is discussed and applied to overcome issues with Heckman’s selection bias treatments, the study also makes use of propensity scoring. Some highlights of its results are a possible slower impact of knowledge on growth than what is described by “badging”. Overall, a positive impact on firm survival is found, with a positive but less pronounced impact on firm growth.

**UK: Marketing Advice – “Evaluating the effect of soft business support upon small firm performance“. Timeframe: 2-8 years.**

As part of the UK Enterprise Initiative, a specific consultancy scheme that subsidised marketing consultants to provide advice to SMEs ran from 1988-1994. In 1996, Wren and Storey (2002) followed up with firms from selected UK regions that had received assistance, to establish whether firms were still trading and if so, to capture a number of firm descriptors and details on what other schemes, if any, they may have taken advantage of. The econometric approach was manifold and considerate of many of the issues that may impact the analysis, selection issues were also accounted for. Through the comparison with a control group (firms that had decided not to apply for the programme) the authors conclude that there is differing evidence of the programme’s impact depending on firm size. For firms with 10-80 employees up to 10% sales growth as well as an increased firm survival rate (up by 4%) are evidenced, compared to no impact for smaller firms as a group. It is also one of the few evaluations that were found to include estimations on the value for money aspect.

**US: Guided set-up preparations – “The influence of guided preparation on the long-term performance of new ventures”. Timeframe: 5-9 years.**



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In this article, Chrisman, McMullan et al. (2005) test a sample of 159 start-ups that received external (pre-launch) preparation assistance through the Small Business Development Center (SBDC) programme 5-9 years prior to the study, and subsequently existed as firms for 3-8 years. Data was gathered via surveys of participants that had received preparation assistance (no none participants control group was included) and who were known to have started a business after.

The measurement of the impact of the received advice is measured by regressing the number of hours of assistance received (as specified by surveyed individuals, based on their memory they had to indicate what provided category of hours their assistance fell into) and a number of controls on sales and employment growth, as measured in 2000. The applied methodology takes selection issues into account.

It was found that guided preparation had a significant impact on the long-term growth of start-ups, with a suggestion of diminishing marginal effectiveness and a stated assumption that too much guided preparation may even yield negative effects in terms of firm performance.

### **US: Counselling/Education – “Counselling Assistance, Entrepreneurship Education, and New Venture Performance”. Timeframe: 5-7 years.**

In a forthcoming article<sup>13</sup> Chrisman, McMullen et al. (2012) investigate the effects of external counselling assistance and entrepreneurship education on firm creation and performance. Their survey sample is based on 256 individuals, who have received counselling/entrepreneurship education from the Pennsylvania Small Business Development Center in either 1996 or 1998. The logistic regression model to test for the effects of the support on new firm creation suggested that entrepreneurship education is linked to new firm set-ups, but counselling is not. Vice versa, the hierarchical regression analyses testing for employment effects (employment figures for 2003) as performance proxy pointed at counselling impacting firm performance, whilst entrepreneurship education did not.

### **“Hybrid” Support Scheme – assessing financial and non-financial support (to access expertise)**

### **New Zealand: “Evaluation of the Growth Services Range: Statistical Analysis using Firm-based performance data”. Timeframe: 7 years.**

This 2009 study of New Zealand’s Ministry of Economic Development assesses the impact of the country’s “growth services range” (GSR) programme on participating firms, through its grants or services (MED 2009). The GSR provides funding for firms to buy external expertise

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<sup>13</sup> At the time of writing only the summary on the journal’s publisher page was available, pending full publication.

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through its Growth Services Fund (GSF), and services through its Client Management Services (CMS), where a case office is assigned to each participating firm, and Market Development Services (MKDS), which provides marketing (research) expertise.

The study draws on a longitudinal database, linking 1,130 GSR participants (and information on type/amount of assistance and intensity of all schemes participated in – including New Zealand schemes other than GSR as controls) to micro-information on firms' financial performance and tax.

The methodology applied draws on a number of econometric models to deal with selection issues, including difference-in-difference estimators and propensity score matching. All estimation approaches suggest generally positive impact on firms (of different magnitude), measured by the sales, value-added and labour productivity effects. Some relevant (to this review) results include higher estimated sales impact for firms that participated in the programme earlier during the assessed period (explained by possible difference in annual firm cohorts), as well as observations of one-off impacts, e.g. for value-add, estimated at 4% the year following assistance, with no change from that absolute level in subsequent years.

### **Financial Support Schemes**

#### **Sweden: “Entrepreneurship policy to support new innovative ventures: Is it effective?”. Timeframe: 8 years**

This study (Norrman, Bager-Sjögren 2010) considers a Swedish Innovation Center (SIC) seed finance scheme for young businesses (“innovators in their absolute earliest phases of development”), using data on 510 assisted firms and 93 rejected applicants. The methodology applied is of note as a rare example of results having been estimated over an extended period for each year post-intervention, allowing for an understanding of gradual/phased impact and its peak. Evidence of estimated scheme impact is sparse, some significant employment growth effects were found when comparing assisted with non-assisted firms, but none for the other measures chosen. Testing for multiple assisted versus single-time no clear direction of impact was found either. The study concludes that no measurable additionality resulted from the scheme (when allowing for bias).

#### **UK: “The Causal Effects of an Industrial Policy”. Timeframe: 19 years.**

Looking at the impact of the UK Regional Selective Assistance programme, based on data spanning nearly two decades, this financial support scheme is found to be effective for smaller firms, whereas no positive impact can be found for firms larger than 150 employees (Criscuolo, Martin et al. 2012).

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Methodologically, this study is a further example of the few available studies using micro data of firms to assess the long-term impact. Notable is its use of Instrumental Variables to account for the policy's targeting of underperforming entities, this avoids the underestimation of impact as found through an ordinary OLS regression. Value for money is also estimated (each job at a cost of US\$6,300).

### **Germany: “Causal effects of German public assistance programmes for young firms”. Timeframe 6-9 years.**

Considering a programme by one of the main providers (DtA – Deutsche Ausgleichsbank) of public assistance to firms in Germany, Almus and Prantl (2001) used a combined dataset of a sample of 12,000 firms having received assistance 1990-1993 (providing a half-yearly overview over indicators such as entry date, employee number and sector), and a follow-up survey with those firms in 1999 to capture data additional information not captured in the former sample.

Firm matching and propensity scoring is undertaken for control reasons and taking into account the selection bias, with the analysis looking at medium-term treatment effects on firm performance (measured by employment growth) and survival chances of assisted firms.

The assistance is found to provide significant positive effects for German firms, as measured by employment growth and survival chances.

### **Italy: “The Life Duration of Small Firms Born Within a Start-up Programme: Evidence from Italy”. Timeframe: 10 years.**

This evaluation of the Italian Law44 programme (Del Monte and Scalera 2001), which aimed at start-up support for Southern Italian firms, makes the case against using survival rates of assisted firms as an indicator of support success. Their subsequent quantitative part finds that the initial (private) capital invested as part of the programme into firms has an inverse relationship to firm survival, whilst the amount of subsidy as well as capital/labour ratio would be related to longer firm survival. The study's key finding on scheme impact is based on a survey – where about half of 85 firms stated they were only able to set-up due to the public subsidy provided. For an econometric estimation of 230 firms a positive correlation between Law44 and the distribution of surviving firms was also found.

### **US: “The Government as Venture Capitalist: The Long-Run Impact of the SBIR Program”. Timeframe: 10 years.**

Lerner (1999) in his review sought to fill the perceived evaluation gap in the field of small firm support programmes, selecting the Small Business

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Innovation Research (SBIR) for evaluation, the largest of small firm support schemes in the US. The analysis covers 10 years of data, to determine SBIR's impact on sales and employment figures of participating firms (having received at least one SBIR award) compared to a control group of similar firms.

The SBIR awardees are found to have enjoyed greater growth in both measured respects than non-awardees. Also, whilst the awardees were no more likely than non-awardees to attract venture capital prior their SBIR award, after this picture changed and awardees fared better at attracting financing. It is noted that a postcode bias exists, namely that awardees in postcode areas with high venture capital activity were to experience significantly higher growth than awardees outside those areas.

Areas highlighted for future consideration were taken account of societal benefits that, of course, would not have been caught by sales and employment figures assessed; as well making sure that growth for award firms was additional, rather than displacing growth elsewhere.

Methodologically, initially the descriptive statistics of awardees vs. non-awardees were compared. A number of OLS and fixed-logit regressions were run, complemented by median regressions to deal with the highly skewed nature of the growth captured. Whilst the author expresses his concern for introducing systematic biases, no models to deal with any selection bias were reported.

**UK (Publicly funded research centres): “Creating advantage in peripheral regions: The role of publicly funded R&D centres”.  
Timeframe: 4-7 years.**

Whilst not considering the long-term impact support on small firms, Hewitt-Dundas and Roper (2011) provide a further rare example of a robust public funds' impact assessment that compares both short and long term effects in some detail.

Their logic model to assess the impact of publicly funded research centres on their respective regions includes data on 18 research centres, university- and company-based, with a longitudinal element captured between 2002-2005 during the funded part of the project, and followed up with interviews in 2009 (which coincided with the end of the period for which most host organisation had undersigned to sustain the public research centre).

Key findings of this study were found to be the significant differences for “innovation, additionality and sustainability between university and company-based PRCs. University-based PRCs have higher levels of short-term additionality, demonstrate higher levels of organisational innovation

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but prove less sustainable. Company-based PRCs demonstrate more partial additionally in the short-term but ultimately prove more sustainable.”

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### **APPENDIX B: Original Evaluation Results (BERR, 2006)**

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**Table B1: Probit Models of the Probability of Receiving Intensive Assistance**

	Model 1		Model 2		Model 3	
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Constant	-1.770	-7.57	-1.867	-9.51	-1.850	-13.57
<b>Firm Characteristics</b>						
Legal Partnership	-0.045	-0.32				
Ltd Liability Company	0.282	2.39	0.361	3.95	0.358	3.95
Other type of company	-0.346	-0.98				
Multi-plant firm	0.143	1.08				
Firm Size (employment)	-0.0002	-0.17				
Firm age: 3-4 years	-0.347	-1.51				
Firm age: 4-5 years	-0.146	-0.66				
Firm age: 5-10 years	-0.477	-2.81	-0.326	-2.35	-0.330	-2.39
Firm age: 10-20 years	-0.323	-2.02	-0.188	-1.49	-0.196	-1.58
Firm age: 20 plus years	-0.753	-4.81	-0.573	-4.83	-0.582	-4.97
<b>Information Variables</b>						
BL mailshots	1.573	16.70	1.566	17.02	1.562	17.01
BL website	1.227	11.50	1.232	11.75	1.230	11.76
BL direct contacts	0.910	8.51	0.916	8.68	0.917	8.76
BL referred by friend	0.363	2.75	0.346	2.67	0.347	2.68
BL referred by advisor	1.093	5.36	1.166	5.82	1.162	5.81
<b>Management Team</b>						
Number of directors	0.045	1.55				
Gender diversity (%)	0.003	1.93	0.002	1.92	0.002	1.91
Ethnic Diversity (%)	-0.001	-0.42				
<b>Industry Dummies</b>						
Agriculture, hunting & forestry	0.861	3.62	0.841	3.63	0.835	4.76
Fishing and related	0.609	0.70	0.603	0.70		
Mining and quarrying	-7.941	0.00	-8.023	0.00		
Manufacturing	0.228	1.13	0.220	1.12	0.215	1.81
Electricity and Water	0.394	0.42	0.344	0.37		
Construction	0.360	1.39	0.335	1.33	0.329	1.67
Retail, wholesale	0.009	0.04	-0.003	-0.02		
Transport, storage etc.	0.499	1.66	0.506	1.72	0.499	1.98
Financial Services	-0.003	-0.01	-0.033	-0.08		
Real Estate etc.	0.320	1.59	0.330	1.68	0.324	2.64
Education	0.255	0.45	0.305	0.56		
Health and Soc Service	0.495	1.98	0.451	1.87	0.446	2.37
Other Services	0.426	1.64	0.419	1.67	0.412	2.03
<b>Model Statistics</b>						
N	2067		2139		2139	
Log Likelihood	-539.67		-555.97		-556.99	
Chi-Squared	1786.13		1852.96		1850.92	
Estrella	0.710		0.711		0.709	
Veall/Zim	0.775		0.776		0.774	
% Correct	88.97		88.59		88.50	

Notes: Hotels and Catering is the excluded Industry Dummy in Models 1 and 2; Chi-Squared Statistic Indicates that  $p < 0.000$  in all models; Coefficients values reported are marginal values computed at variable means; Marginals for Dummy Variables relate to the impact of a change from 0 to 1.



## Feasibility Study – The Long-Term Impact of Business Support

**Table B2: Probit Models of the Probability of Receiving Other Assistance**

	Model 1		Model 2		Model 3	
	Coef.	t-stat	Coef.	t-stat	Coef.	t-stat
Constant	-1.463	-6.82	-1.590	-9.42	-1.327	-14.84
<b>Firm Characteristics</b>						
Legal Partnership	-0.255	-2.01	-0.174	-1.66	-0.161	-1.56
Ltd Liability Company	-0.099	-0.99				
Other type of company	-0.192	-0.62				
Multi-plant firm	0.038	0.31				
Firm Size (employment)	0.000	-0.10				
Firm age: 3-4 years	0.015	0.07				
Firm age: 4-5 years	-0.146	-0.66				
Firm age: 5-10 years	-0.089	-0.55				
Firm age: 10-20 years	-0.099	-0.64				
Firm age: 20 plus years	-0.464	-3.09	-0.377	-4.55	-0.376	-4.58
<b>Information Variables</b>						
BL mailshots	1.730	19.93	1.720	20.31	1.719	20.38
BL website	1.186	11.91	1.185	12.15	1.176	12.14
BL direct contacts	0.601	5.66	0.610	5.83	0.603	5.78
BL referred by friend	0.153	1.13	0.211	1.59	0.211	1.59
BL referred by advisor	0.583	2.67	0.591	2.73	0.612	2.85
<b>Management Team</b>						
Number of directors	0.026	0.94				
Gender diversity (%)	0.001	1.05	0.002	1.54	0.002	1.68
Ethnic Diversity (%)	0.000	0.07				
<b>Industry Dummies</b>						
Agriculture, hunting & forestry	0.393	1.71	0.402	1.79		
Fishing and related	-0.059	-0.06	-0.008	-0.01		
Mining and quarrying	-0.426	-0.31	-0.416	-0.31		
Manufacturing	0.172	0.94	0.198	1.12		
Electricity and Water	-5.688	0.00	-5.684	0.00		
Construction	0.575	2.60	0.574	2.66	0.311	1.93
Retail, wholesale	-0.043	-0.24	-0.015	-0.09	-0.281	-2.82
Transport, storage etc.	0.345	1.24	0.381	1.38		
Financial Services	-0.457	-1.02	-0.488	-1.12	-0.753	-1.83
Real Estate etc.	0.416	2.31	0.454	2.61	0.189	1.80
Education	0.524	1.19	0.553	1.28		
Health and Soc Service	0.259	1.08	0.226	0.99		
Other Services	0.326	1.38	0.345	1.49		
Hotels, catering					-0.268	-1.64
N	2086		2167		2167	
Log Likelihood	-633.75		-656.72		-658.24	
Chi-Squared	1624.23		1690.66		1687.61	
Estrella	0.662		0.662		0.661	
Veall/Zim	0.739		0.739		0.738	
% Correct	87.87		87.72		87.82	

Notes: Hotels and Catering is the excluded Industry Dummy in Models 1 and 2; Chi-Squared Statistic indicates that  $p < 0.000$  in all models; Coefficients values reported are marginal values computed at variable means; Marginals for Dummy Variables relate to the impact of a change from 0 to 1.

## Feasibility Study – The Long-Term Impact of Business Support

**Table B3: Impact of Intensive Assistance versus No Assistance: Full Model excluding Selection Effects**

	Employment Growth		Sales Growth		Productivity Growth	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	0.009	0.351	-0.034	-0.482	-0.027	-0.347
<b>Firm Characteristics</b>						
Firm Size	0	-0.544	0	-0.202	0	0.769
Size squared	0	0.273	0.002	0.844	0	-0.008
Firm age: 3-4 years	-0.023	-1.265	0.039	0.821	0.009	0.165
Firm age: 4-5 years	-0.013	-0.766	0.022	0.488	0.01	0.2
Firm age: 5-10 years	-0.009	-0.647	-0.011	-0.314	-0.051	-1.237
Firm age: 10-20 years	-0.015	-1.114	-0.049	-1.397	-0.068	-1.694
Firm age: 20 plus years	-0.023	-1.698	-0.052	-1.464	-0.057	-1.4
Legal Partnership	0.009	0.742	0.024	0.772	0.021	0.614
Ltd Liability Company	0.013	1.328	0.029	1.107	0.012	0.436
Other type of company	0.003	0.088	-0.013	-0.155	-0.001	-0.015
Multi-plant firm	0.029	2.572	-0.019	-0.697	-0.025	-0.813
Exporter	0	-0.022	0.004	0.182	0.018	0.801
<b>Market Characteristics</b>						
No. of competitors	-0.009	-1.128	-0.008	-0.415	0.027	1.367
Own Price Elasticity	-0.006	-0.488	-0.02	-0.67	-0.048	-1.505
<b>Business Strategy</b>						
Focus: Sales in current markets	0.024	3.129	-0.006	-0.339	-0.013	-0.636
Focus: Sales in new markets	0.017	1.592	0.077	3.403	0.048	1.963
Focus: New products, new markets	0.012	0.864	-0.01	-0.319	-0.019	-0.534
Formal Business Plan	0.026	3.212	0.007	0.377	-0.031	-1.472
Non-executive Directors	-0.004	-0.356	0.03	1.046	0.017	0.528
<b>Owner Manager</b>						
O-M has equity	0.001	0.12	0.033	1.196	0.019	0.642
O-M age 25-34	0.02	0.97	0.044	0.822	0.015	0.26
O-M age 35-44	0.003	0.183	0.017	0.399	0.018	0.413
O-M age 45-54	-0.006	-0.336	0.044	1.094	0.057	1.345
O-M age 55 plus	-0.016	-0.907	0.021	0.513	0.045	1.06
Serial Founder	-0.003	-0.341	0.013	0.734	0.013	0.656
<b>Intensively-Assisted Firms</b>	<b>0.022</b>	<b>2.831</b>	<b>0.028</b>	<b>1.432</b>	<b>-0.012</b>	<b>-0.577</b>

**Note:** Models Also Include a Full Set of Industry Dummies to Control for Industry Specific Differences in employment, turnover, and productivity growth. Models with selection effects are included in Table 4.3.

## Feasibility Study – The Long-Term Impact of Business Support

**Table 4: Impact of Other Assistance versus No Assistance: Full Model  
Excluding Selection Effects**

	Employment		Sales		Productivity	
	Growth		Growth		Growth	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	0.03	1.338	0.106	1.247	0.02	0.222
<b>Firm Characteristics</b>						
Firm Size	0	-0.666	0	-1.479	0	-0.281
Size squared	0	0.732	0	1.219	0	0.012
Firm age: 3-4 years	-0.003	-0.169	0.101	1.668	0.117	1.687
Firm age: 4-5 years	0	0.02	0.008	0.128	0.058	0.855
Firm age: 5-10 years	-0.008	-0.592	-0.03	-0.588	0.047	0.803
Firm age: 10-20 years	-0.013	-1.048	-0.051	-1.032	0.028	0.495
Firm age: 20 plus years	-0.022	-1.831	-0.076	-1.495	-0.001	-0.022
Legal Partnership	0.006	0.602	-0.007	-0.195	0.004	0.106
Ltd Liability Company	0.019	2.334	0.036	1.236	0.005	0.157
Other type of company	-0.025	-1.023	-0.09	-0.943	-0.07	-0.679
Multi-plant firm	0.027	2.65	0.058	1.573	0.028	0.708
Exporter	0.003	0.382	-0.021	-0.729	-0.026	-0.854
<b>Market Characteristics</b>						
No. of competitors	-0.013	-1.996	-0.006	-0.277	0.024	0.951
Own Price Elasticity	-0.023	-1.854	-0.102	-2.41	-0.084	-1.919
<b>Business Strategy</b>						
Focus: Sales in current markets	0.017	2.524	-0.045	-1.918	-0.063	-2.542
Focus: Sales in new markets	-0.008	-0.71	0.057	1.878	0.077	2.345
Focus: New products, new markets	0.03	2.266	-0.072	-1.604	-0.065	-1.315
Formal Business Plan	0.001	0.126	0.035	1.382	-0.005	-0.175
Non-executive Directors	0.004	0.342	-0.012	-0.347	-0.001	-0.018
<b>Owner Manager</b>						
O-M has equity	-0.021	-2.014	0.019	0.553	0.03	0.81
O-M age 25-34	0.011	0.649	-0.005	-0.08	0.007	0.11
O-M age 35-44	0.017	1.19	-0.005	-0.109	-0.012	-0.249
O-M age 45-54	0.013	0.967	0.019	0.411	-0.009	-0.188
O-M age 55 plus	0	0.013	0.01	0.213	0.021	0.434
Serial Founder	0.009	1.256	0.028	1.187	0.044	1.747
<b>Other-Assisted Firms</b>	<b>0.008</b>	<b>1.177</b>	<b>0.042</b>	<b>1.705</b>	<b>0.05</b>	<b>1.902</b>

**Note:** Models Also Include a Full Set of Industry Dummies to Control for Industry Specific Differences in employment, turnover, and productivity growth. Models with selection effects are included in Table 4.3.

## Feasibility Study – The Long-Term Impact of Business Support

### APPENDIX C: New Econometric Results

Table C1:

Probit Models of the Probability of Receiving Intensive / Other Assistance		
	IA	OA
	Int. Assist.	Other Assist.
Legal Partnership	-0.253	0.707
Ltd Liability Company	0.273	0.195
Other type of company	0.176	0.531
Multi-plant firm	-0.577*	0.111
Firm Size (2004 Employment)	-0.000	-0.000
Firm age: 3-4 years	-1.317*	-0.294
Firm age: 4-5 years	-2.082***	-1.512**
Firm age: 5-10 years	-2.008***	-1.453**
Firm age: 10-20 years	-1.733***	-0.873
Firm age: 20 plus years	-2.070***	-1.126*
BL mailshots	1.193***	1.729***
BL website	1.230***	0.544**
BL contacts	0.428*	0.172
BL referred by friend	0.36	-0.229
BL referred by advisor	1.142***	0.213
Number of directors	0.033	0.088
Gender diversity (%)	0.008*	0.002
Ethnic diversity (%)	0.001	0.008
sic1	0.397	0.741
o.sic2	0	0
o.sic3	0	0
sic4	0.717	1.271**
o.sic5	0	0
sic6	0.377	1.173*
sic7	-0.026	0.582
o.sic9	0	0
sic10	0.535	0
sic11	0.982	1.822***
sic12	1.338	0
sic13	-0.76	-0.048
sic14	-0.018	0.462
Constant	-0.727	-1.846*
Observations	251	234
*** p<0.01, ** p<0.05, * p<0.1		

## Feasibility Study – The Long-Term Impact of Business Support

**Table C2**

Impact of IA (vs. no assistance) on employment growth (full model excl. selection effects)	2004- 2010	2004- 2009	2004- 2008	2004- 2007	2004- 2006	2004- 2005
Firm Size (Empl. 2004)	0.000***	0.001**	0.000	0.000	0.000	0.000*
Firm Size squared	-0.000***	-0.000**	0.000	0.000	0.000	-0.000*
Firm age: 3-4 years	0.295	0.215	0.155	0.061	0.017	0.011
Firm age: 4-5 years	0.150	0.108	0.223	0.210	0.132	0.141
Firm age: 5-10 years	-0.094	-0.056	-0.040	-0.032	-0.028	-0.045
Firm age: 10-20 years	-0.250	-0.262	-0.261	-0.217	-0.076	-0.052
Firm age: 20 plus years	-0.389	-0.426*	-0.359*	-0.332	-0.223	-0.120
Legal Partnership	0.763	0.807	0.579	0.010	0.116	-0.086
Ltd Liability Company	-0.022	0.229	0.036	-0.125	0.109	0.057
Other type of company	0.162	0.613	0.392	0.346	0.304	-0.113
Multi-plant firm	0.371**	0.366**	0.561***	0.539***	0.390***	0.257***
Exporter	0.205	0.182	0.117	0.117	0.077	0.035
Competitive Environ.	0.059	0.027	0.108	0.145	-0.012	0.028
Own Price Elasticity	0.018	0.142	0.088	0.046	0.092	-0.044
Focus: Maintain Sales	-0.266	-0.326	-0.326	-0.297	-0.316	-0.123
Focus: Sales in current markets	-0.013	-0.002	0.003	-0.008	-0.151	-0.080
Focus: Sales in new markets	-0.039	-0.040	-0.179	-0.244	-0.378	-0.132
Focus: New products, new markets	0.040	-0.038	-0.218	-0.346	-0.308	-0.152
Formal Business Plan	-0.305**	-0.310**	-0.348***	-0.324***	-0.340***	-0.090
Non-executive Directors	0.144	0.135	0.007	0.004	-0.012	-0.005
O-M has equity	0.068	-0.094	-0.002	-0.001	0.033	-0.004
O-M age 25-34	0.882*	1.114**	0.785	0.622	0.580	-0.004
O-M age 35-44	0.587	0.690	0.492	0.427	0.519	0.034
O-M age 45-54	0.341	0.457	0.409	0.309	0.354	0.003
O-M age 55 plus	0.361	0.452	0.268	0.207	0.293	-0.071
Serial Founder	0.110	0.070	0.023	0.042	0.075	-0.024
Agriculture, hunting & forestry	0.148	-0.450	-0.188	-0.214	-0.230	-0.092
Fishing and related	0.000	0.000	0.000	0.000	0.000	0.000
Mining and quarrying	0.000	0.000	0.000	0.000	0.000	0.000
Manufacturing	0.201	-0.134	0.163	0.251	0.158	0.225
Electricity and Water	-1.948**	-2.36***	-1.360*	-0.284	-0.164	0.219
Construction	0.463	0.082	0.313	0.363	0.336	0.316*
Retail, wholesale	0.319	-0.036	0.216	0.311	0.180	0.244
Transport, storage etc.	0.236	-0.163	0.041	0.198	0.152	0.219
Financial Services	-0.065	-0.878*	-0.594	-0.645	-0.568	0.090
Real Estate etc.	0.064	-0.184	0.113	0.214	0.130	0.309*
Education	0.352	0.034	0.297	0.228	0.436	0.568*
Health and Soc Service	0.520	-0.170	0.123	0.165	0.203	0.417
Other Services	0.174	-0.342	0.012	0.126	-0.026	0.217
Intensive Assistance	0.244*	0.246*	0.240*	0.228*	0.204*	-0.015
Constant	-0.542	-0.316	-0.333	-0.259	-0.323	-0.059
Observations	205	205	207	207	207	207
R-squared	0.289	0.318	0.281	0.247	0.211	0.173

## Feasibility Study – The Long-Term Impact of Business Support

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\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Feasibility Study – The Long-Term Impact of Business Support

**Table C3**

Impact of OA (vs. no assistance) on employment growth (full model excl. selection effects)						
	2004-'10	2004-'09	2004-'08	2004-'07	2004-'06	2004-'05
Firm Size (Empl. 2004)	0.002	0.002	0.002	0.001	0.000	0.001
Firm Size squared	0.000	0.000	0.000	0.000	0.000	0.000
Firm age: 3-4 years	1.069**	0.717	0.533	0.413	0.468	-0.016
Firm age: 4-5 years	0.221	0.057	-0.099	-0.116	-0.195	-0.235
Firm age: 5-10 years	0.292	0.190	-0.088	0.019	-0.073	-0.269*
Firm age: 10-20 years	0.124	0.013	-0.184	-0.005	0.029	-0.208
Firm age: 20 plus years	0.184	0.052	-0.104	-0.002	-0.020	-0.297**
Legal Partnership	0.104	0.410	0.283	0.255	0.097	0.164
Ltd Liability Company	-0.218	-0.072	-0.053	-0.046	0.115	0.206
Other type of company	0.094	-0.156	-0.203	-0.266	0.067	0.033
Multi-plant firm	0.016	0.139	0.267	0.233	0.220	-0.011
Exporter	0.076	0.073	0.130	0.191	0.033	0.051
Competitive Environ.	0.106	0.057	0.118	0.072	0.059	-0.003
Own Price Elasticity	-0.186	-0.103	-0.191	-0.160	-0.135	-0.047
Focus: Maintain Sales	-0.135	-0.140	-0.089	0.104	-0.024	-0.098
Focus: Sales in current markets	0.152	0.160	0.186	0.324	0.108	0.009
Focus: Sales in new markets	-0.338	-0.249	-0.098	0.157	0.057	-0.062
Focus: New products, new markets	-0.957	-0.790	-0.347	-0.326	-0.180	-0.191
Formal Business Plan	-0.048	-0.029	-0.166	-0.101	-0.165	-0.035
Non-executive Directors	0.248	0.328*	0.290	0.271	0.134	0.062
O-M has equity	0.209	0.172	0.222	0.172	0.084	-0.062
O-M age 25-34	1.410*	1.296*	1.057	1.066	0.761	0.104
O-M age 35-44	0.902	0.890	0.861	0.884	0.729	0.187
O-M age 45-54	0.607	0.621	0.696	0.720	0.561	0.132
O-M age 55 plus	0.592	0.614	0.649	0.720	0.575	0.214
Serial Founder	0.027	-0.057	0.000	0.006	-0.042	-0.018
Agriculture, hunting & forestry	0.474	-0.458	-0.188	-0.335	-0.280	0.109
Fishing and related	0.000	0.000	0.000	0.000	0.000	0.000
Mining and quarrying	0.000	0.000	0.000	0.000	0.000	0.000
Manufacturing	0.257	-0.506	-0.139	-0.141	-0.011	0.282
Electricity and Water	0.000	0.000	0.000	0.000	0.000	0.000
Construction	0.302	-0.434	-0.096	0.043	0.055	0.379*
Retail, wholesale	0.493	-0.357	0.011	-0.008	-0.018	0.381*
Transport, storage etc.	0.428	-0.395	-0.010	0.032	0.093	0.379
Financial Services	0.222	-0.932	-0.543	-0.655	-0.661	0.158
Real Estate etc.	0.687	-0.160	0.227	0.243	0.241	0.399*
Education	1.260	0.333	0.603	0.320	1.036	1.275***
Health and Soc Service	1.189	0.397	0.771	0.824	0.540	0.815**
Other Services	0.289	-0.517	-0.098	-0.100	-0.133	0.302
Intensive Assistance	0.117	0.146	0.069	0.073	0.023	-0.073
Constant	-1.413	-0.600	-0.852	-1.173	-0.798	-0.280
Observations	190	190	191	191	191	191
R-squared	0.226	0.217	0.192	0.166	0.128	0.211

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



## Feasibility Study – The Long-Term Impact of Business Support

**Table C4**  
**Impact of IA (vs. no assistance) on sales growth (full model excl. selection effects)**

	2004-'10	2004-'09	2004-'08	2004-'07	2004-'06	2004-'05
Firm Size (Empl. 2004)	0.000*	0.001	0.000	0.000	0.000	0.000
Firm Size squared	-0.000	0.000	0.000	0.000	0.000	0.000
Firm age: 3-4 years	0.438	0.507	0.489	0.437	0.267	0.096
Firm age: 4-5 years	0.558*	0.689**	0.659**	0.657**	0.599***	0.505***
Firm age: 5-10 years	0.259	0.390	0.333	0.448*	0.279	0.305*
Firm age: 10-20 years	0.035	0.195	0.142	0.301	0.273	0.274*
Firm age: 20 plus years	-0.182	-0.009	0.029	0.155	0.085	0.164
Legal Partnership	0.193	-0.106	-0.120	-0.568	-0.409	-0.409
Ltd Liability Company	-0.298	-0.355	-0.320	-0.481	-0.153	-0.079
Other type of company	-0.120	-0.077	-0.009	-0.272	-0.460	-0.197
Multi-plant firm	0.187	0.187	0.159	0.343*	0.239	0.126
Exporter	0.333*	0.190	0.202	0.221	0.178	0.218**
Competitive Environ.	0.075	-0.005	0.045	0.061	0.015	0.164*
Own Price Elasticity	0.182	0.202	0.245	0.150	0.172	0.050
Focus: Maintain Sales	0.054	-0.076	-0.169	0.043	0.192	0.179
Focus: Sales in current markets	0.345	0.204	0.119	0.183	0.318	0.186
Focus: Sales in new markets	0.319	0.118	0.132	0.104	0.337	0.438*
Focus: New products, new markets	0.434	0.342	0.199	0.195	0.421	0.225
Formal Business Plan	-0.117	-0.210	-0.219	-0.145	-0.207*	-0.119
Non-executive Directors	-0.033	-0.014	-0.061	-0.047	0.032	0.006
O-M has equity	-0.123	-0.149	-0.111	-0.046	-0.108	-0.006
O-M age 25-34	0.917	0.875	0.751	0.457	0.306	-0.229
O-M age 35-44	0.932	0.707	0.612	0.535	0.475	-0.050
O-M age 45-54	0.707	0.570	0.493	0.464	0.388	-0.123
O-M age 55 plus	0.273	0.238	0.135	0.189	0.160	-0.423
Serial Founder	0.089	0.092	0.110	0.054	0.056	-0.063
Agriculture, hunting & forestry	-0.251	-0.504	-0.302	-0.354	-0.368	-0.322
Fishing and related	0.000	0.000	0.000	0.000	0.000	0.000
Mining and quarrying	0.000	0.000	0.000	0.000	0.000	0.000
Manufacturing	0.032	-0.009	0.121	0.004	0.052	-0.056
Electricity and Water	-0.600	-3.023***	-2.148**	-0.948	-0.343	-0.672
Construction	0.324	0.296	0.458	0.285	0.166	0.022
Retail, wholesale	0.260	0.459	0.505	0.544	0.472	0.160
Transport, storage etc.	0.193	0.137	0.205	-0.381	-0.051	-0.360
Financial Services	0.301	0.175	0.455	0.061	-0.120	-0.043
Real Estate etc.	-0.210	-0.223	-0.025	-0.144	-0.051	-0.131
Education	-1.002	-0.874	-0.635	-0.690	-1.059*	-0.967**
Health and Soc Service	0.072	-0.083	0.070	0.196	0.539	0.238
Other Services	-0.122	-0.428	-0.055	-0.121	0.027	0.113
Intensive Assistance	0.205	0.268	0.326*	0.212	0.020	-0.056
Constant	-0.779	-0.440	-0.541	-0.594	-0.717	-0.192
Observations	207	207	209	209	209	210
R-squared	0.228	0.228	0.212	0.218	0.219	0.274

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Feasibility Study – The Long-Term Impact of Business Support

**Table C5**  
**Impact of OA (vs. no assistance) on sales growth (full model excl. selection effects)**

	2004-'10	2004-'09	2004-'08	2004-'07	2004-'06	2004-'05
Firm Size (Empl. 2004)	0.000*	0.002	0.002	0.001	0.000	0.000
Firm Size squared	0.000*	0.000	0.000	0.000	0.000	0.000
Firm age: 3-4 years	0.135	-0.425	-0.344	-0.171	-0.245	-0.404*
Firm age: 4-5 years	-0.275	-0.457	-0.527	-0.510	-0.642**	-0.233
Firm age: 5-10 years	-0.070	-0.230	-0.262	-0.202	-0.478*	-0.258
Firm age: 10-20 years	-0.582	-0.733*	-0.631*	-0.519*	-0.549**	-0.204
Firm age: 20 plus years	-0.549	-0.522	-0.506	-0.441	-0.543**	-0.315*
Legal Partnership	-0.573	-0.543	-0.051	-0.094	-0.063	0.005
Ltd Liability Company	-1.203***	-0.972**	-0.475	-0.368	-0.095	-0.015
Other type of company	-0.979	-0.686	-0.347	-0.183	-0.185	-0.011
Multi-plant firm	0.062	0.171	0.103	0.118	0.032	0.047
Exporter	0.176	0.029	0.187	0.183	0.068	0.110
Competitive Environ.	0.134	0.131	0.006	0.027	-0.031	-0.015
Own Price Elasticity	-0.176	-0.150	-0.084	-0.087	0.005	0.029
Focus: Maintain Sales	-0.269	-0.166	-0.029	-0.145	-0.196	-0.150
Focus: Sales in current markets	0.109	0.053	0.065	-0.066	-0.122	-0.244*
Focus: Sales in new markets	-0.480	-0.696	0.159	-0.052	-0.041	-0.127
Focus: New products, new markets	-1.281	-1.095	-0.726	-0.537	-0.499	-0.317
Formal Business Plan	0.128	0.097	0.138	0.082	-0.010	0.084
Non-executive Directors	0.153	0.261	0.203	0.141	0.034	-0.073
O-M has equity	0.036	0.022	0.017	0.000	-0.077	0.004
O-M age 25-34	0.608	0.476	0.568	0.358	0.147	-0.128
O-M age 35-44	0.700	0.498	0.704	0.557	0.542	0.113
O-M age 45-54	0.392	0.270	0.556	0.429	0.461	0.064
O-M age 55 plus	0.169	0.181	0.481	0.329	0.389	-0.041
Serial Founder	-0.021	0.003	-0.083	-0.110	-0.036	-0.055
Agriculture, hunting & forestry	-0.632	-1.058	-0.747	-0.658	-0.482	-0.229
Fishing and related	0.000	0.000	0.000	0.000	0.000	0.000
Mining and quarrying	0.000	0.000	0.000	0.000	0.000	0.000
Manufacturing	-0.331	-0.551	-0.434	-0.493	-0.166	-0.119
Electricity and Water	0.000	0.000	0.000	0.000	0.000	0.000
Construction	-0.014	-0.364	-0.241	-0.195	-0.076	-0.012
Retail, wholesale	-0.263	-0.365	-0.182	-0.136	0.105	0.020
Transport, storage etc.	0.053	-0.200	-0.131	-0.250	0.091	0.100
Financial Services	0.018	-0.456	-0.068	-0.391	-0.345	0.016
Real Estate etc.	-0.396	-0.715	-0.367	-0.411	0.000	-0.182
Education	-0.193	-0.264	0.132	0.392	1.170	0.725
Health and Soc Service	-0.270	-0.692	-0.489	-0.475	-0.149	-0.157
Other Services	-0.165	-0.613	-0.342	-0.393	-0.113	0.172
Intensive Assistance	0.346*	0.245	0.214	0.227*	0.083	-0.008
Constant	1.204	1.504	0.522	0.642	0.529	0.535
Observations	192	192	193	193	193	193
R-squared	0.250	0.179	0.161	0.174	0.174	0.184

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Feasibility Study – The Long-Term Impact of Business Support

**Table C6**  
**Impact of IA (vs. no assistance) on productivity growth (full model excl. selection effects)**

	2004-'10	2004-'09	2004-'08	2004-'07	2004-'06	2004-'05
Firm Size (Empl. 2004)	0.000	0.000	0.000	0.000	0.000	0.000
Firm Size squared	0.000	0.000	0.000	0.000	0.000	0.000
Firm age: 3-4 years	0.271	0.153	0.030	0.008	-0.143	-0.205
Firm age: 4-5 years	0.518*	0.529*	0.205	0.190	0.128	0.115
Firm age: 5-10 years	0.447*	0.595**	0.268	0.331	0.084	0.206
Firm age: 10-20 years	0.418	0.592**	0.371	0.425	0.148	0.201
Firm age: 20 plus years	0.379	0.627**	0.329	0.409	0.151	0.182
Legal Partnership	0.057	-0.836*	-0.530	-0.112	0.654	1.025**
Ltd Liability Company	0.026	-0.274	-0.134	0.044	0.732**	0.688**
Other type of company	-0.309	-0.520	-0.164	-0.227	0.211	0.718
Multi-plant firm	-0.126	-0.177	-0.343	-0.189	-0.170	-0.264
Exporter	0.122	-0.082	0.051	0.068	0.073	0.176
Competitive Environ.	-0.105	-0.104	0.049	0.010	0.016	-0.031
Own Price Elasticity	0.182	0.135	0.264	0.164	0.140	0.123
Focus: Maintain Sales	0.444	0.214	0.045	0.225	0.263	0.087
Focus: Sales in current markets	0.371	0.145	0.005	0.080	0.307	0.080
Focus: Sales in new markets	0.198	0.022	0.217	0.286	0.645*	0.667*
Focus: New products, new markets	0.576	0.390	0.250	0.395	0.641	0.324
Formal Business Plan	0.262*	0.120	0.082	0.188	0.184	0.097
Non-executive Directors	-0.132	-0.083	-0.021	0.035	0.164	0.172
O-M has equity	-0.261	-0.123	-0.189	-0.131	-0.051	0.077
O-M age 25-34	-0.037	-0.171	0.050	-0.054	-0.055	0.036
O-M age 35-44	0.328	-0.008	0.087	0.163	0.135	0.037
O-M age 45-54	0.361	0.069	0.049	0.168	0.115	-0.025
O-M age 55 plus	-0.125	-0.249	-0.147	0.084	0.089	-0.038
Serial Founder	0.084	0.081	0.124	0.070	0.018	0.061
Agriculture, hunting & forestry	-0.328	-0.016	-0.092	-0.076	0.111	-0.009
Fishing and related	0.000	0.000	0.000	0.000	0.000	0.000
Mining and quarrying	0.000	0.000	0.000	0.000	0.000	0.000
Manufacturing	-0.191	0.052	-0.068	-0.269	-0.193	-0.467
Electricity and Water	1.242	-0.688	-0.611	-0.503	-0.099	-1.072
Construction	-0.184	0.161	0.200	-0.101	-0.170	-0.280
Retail, wholesale	-0.035	0.548	0.201	0.101	0.182	-0.217
Transport, storage etc.	0.023	0.320	0.144	-0.573	-0.227	-0.664
Financial Services	0.672	1.162*	1.031	0.869	0.719	0.349
Real Estate etc.	-0.348	-0.028	-0.023	-0.218	-0.023	-0.449
Education	-1.415*	-0.812	-0.877	-0.958	-1.649**	-1.822**
Health and Soc Service	-0.315	0.077	0.001	0.055	0.412	-0.214
Other Services	-0.360	-0.402	-0.279	-0.523	-0.099	-0.600
Intensive Assistance	-0.061	0.011	0.096	-0.068	-0.283*	-0.125
Constant	-0.620	-0.367	-0.242	-0.540	-1.213	-0.765
Observations	222	222	223	223	223	224
R-squared	0.642	0.618	0.518	0.557	0.503	0.471

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Feasibility Study – The Long-Term Impact of Business Support

**Table C7**

**Impact of OA (vs. no assistance) on productivity growth (full model excl. selection effects)**

	2004-'10	2004-'09	2004-'08	2004-'07	2004-'06	2004-'05
Firm Size (Empl. 2004)	0.000	0.000	0.000	0.000	0.000	0.000
Firm Size squared	0.000	0.000	0.000	0.000	0.000	0.000
Firm age: 3-4 years	-0.629	-1.118**	-0.779	-0.499	-0.591	-0.174
Firm age: 4-5 years	-0.374	-0.696	-0.400	-0.408	-0.461	-0.080
Firm age: 5-10 years	-0.491	-0.503	0.086	-0.234	-0.300	-0.010
Firm age: 10-20 years	-0.545	-0.712*	-0.306	-0.415	-0.450	-0.098
Firm age: 20 plus years	-0.477	-0.321	-0.057	-0.240	-0.346	0.166
Legal Partnership	0.293	-0.022	0.374	0.267	0.845*	0.563
Ltd Liability Company	-0.135	0.003	-0.117	-0.309	0.281	0.092
Other type of company	0.011	0.364	0.061	-0.034	0.057	0.070
Multi-plant firm	-0.007	-0.037	-0.152	-0.099	-0.194	0.085
Exporter	0.123	-0.216	-0.199	-0.164	-0.139	-0.070
Competitive Environ.	0.082	0.126	0.012	0.083	-0.082	-0.028
Own Price Elasticity	0.105	0.051	0.201	0.112	0.264	-0.050
Focus: Maintain Sales	0.034	0.071	-0.121	-0.117	-0.407	-0.500*
Focus: Sales in current markets	0.007	-0.125	-0.276	-0.212	-0.324	-0.449
Focus: Sales in new markets	0.177	-0.238	0.180	-0.141	-0.156	-0.406
Focus: New products, new markets	-0.197	-0.581	-0.653	-0.508	-0.719	-0.866
Formal Business Plan	0.307*	0.123	0.311*	0.230	0.119	0.170
Non-executive Directors	-0.062	0.076	-0.097	-0.165	-0.150	-0.147
O-M has equity	-0.224	-0.267	-0.297	-0.235	-0.054	0.222
O-M age 25-34	-0.542	-0.526	-0.643	-0.572	-0.513	0.218
O-M age 35-44	-0.128	-0.308	-0.453	-0.316	-0.214	0.067
O-M age 45-54	-0.201	-0.451	-0.468	-0.377	-0.224	0.079
O-M age 55 plus	-0.249	-0.247	-0.302	-0.221	-0.052	-0.155
Serial Founder	0.036	0.004	-0.162	-0.200	-0.100	0.028
Agriculture, hunting & forestry	-1.147*	-0.639	-0.747	0.704	0.915	0.487
Fishing and related	0.000	0.000	0.000	0.000	0.000	0.000
Mining and quarrying	0.000	0.000	0.000	0.000	0.000	0.000
Manufacturing	-0.685	-0.225	-0.430	0.860	0.930*	0.339
Electricity and Water	0.000	0.000	0.000	0.000	0.000	0.000
Construction	-0.540	-0.331	-0.432	0.869	0.977*	0.475
Retail, wholesale	-0.803	-0.187	-0.561	0.856	1.143**	0.277
Transport, storage etc.	-0.671	-0.488	-0.755	0.329	0.467	0.206
Financial Services	-0.317	-0.007	-0.098	1.002	1.098	0.586
Real Estate etc.	-1.175**	-0.803	-0.968*	0.409	0.833*	0.392
Education	-1.529	-0.274	-0.127	1.496	1.588	0.048
Health and Soc Service	-1.720**	-1.464	-1.600*	-0.260	0.479	-0.071
Other Services	-0.632	-0.558	-0.631	0.688	0.987*	0.368
Intensive Assistance	0.072	-0.003	0.206	0.053	0.066	-0.094
Constant	1.551	1.460	1.608	0.546	-0.154	-0.171
Observations	212	212	213	213	213	213
R-squared	0.620	0.528	0.518	0.393	0.416	0.261

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Feasibility Study – The Long-Term Impact of Business Support

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