# Regional Selective Assistance in Scotland: Econometric Analysis 2004/05 – 2010/11

## Final Report

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# Executive Summary

- **The aim of this report is to provide an analysis of the impact of Regional Selective Assistance (RSA) on employment and turnover growth in Scotland over the post-2007 period. RSA is the main national scheme of financial assistance to industry in Scotland and encourages businesses to undertake investment that will directly result in the creation or safeguarding of jobs.**

- **The data for the analysis included details of RSA offers and payments made to 693 firms over the 2004-12 period. Firms in receipt of RSA were matched to the Business Structure Database; the resulting analysis covered 422 firms, £122m of offers and £99m of payments.**

- **The majority of offers were accepted over the 2004-07 period; the mean offer was £272k whilst the median offer was £120,000. In contrast, the majority of payments were drawn down over the 2008-12 period; the mean payment was £123k whilst the median was £100k.**

- **The majority of firms (63%) in receipt of payments were Scottish-owned. Two fifths of all payments went to projects for Modernisation/Expansion within Scotland and a further third for New Projects on Existing Sites. Just 7% each was paid out for Relocation from elsewhere in the UK, and for Start-ups.**

- **RSA-assisted firms had a different profile than their non-assisted counterparts; they were typically larger and older whilst a higher share were foreign-owned. The sectoral contribution between the two sets of firms also differed, with a much greater share of RSA-assisted firms and employment located in the Manufacturing sector.**

- **Over the 2004-11 period RSA-assisted firms grew by around 3% pa compared to 0.4% pa for non-assisted firms, with UK-owned firms performing best. Over the more recent 2010-11 period employment within both sets of firms fell. Growth pre- and post-RSA assistance was analysed and found to generally be higher in the post-assistance period, particularly over smaller time frames.**

- **Econometric analysis was used to assess the impact of RSA assistance on growth, isolating the impact of assistance from other contributing factors. The analysis was conducted over the 2007-11 period and the 2010-11 period and looked at the effect of assistance on employment, turnover and productivity growth.**

- **The models showed that being in receipt of RSA had a positive impact on employment and turnover growth, with the strongest impact felt over the 2007-11 period. Importantly it was offers of assistance that had an effect on growth, with no such impact detected from payments. In the majority**

**of models being Account Managed also had an impact, suggesting that the wider package of support offered by Scottish Enterprise was also key to growth.**

- **The impact of RSA to the economy was estimated using the results of the econometric modelling. The grossed-up results suggested that up to 3,649 jobs were added to the economy over 2007-11 based on payments made to the 693 firms in receipt of RSA. These jobs generated value added of around £201m, giving a cost-per-job of £26k.**

- **The results were compared to an analysis of Selective Financial Assistance undertaken for Northern Ireland over the same period. That study also found that offers of assistance were responsible for driving employment growth amongst assisted firms, and that payments had no impact. Importantly, the NI results were only significant for the latter 2010-11 period rather than the 2007-11 period.**

- **The NI results, combined with qualitative survey analysis, suggested that offers of assistance acted as an important leverage tool for firms helping to secure additional investment; inspire confidence within the firm and provide credibility to external suppliers and clients and hence were more important for employment generation than the subsequent payments. The similarity of the results with Scotland suggest that RSA offers are being used in the same way.**

- **Overall the results suggest that RSA has had a positive impact on the Scottish economy and, importantly, was responsible for generating additional jobs within a period of economic downturn. In fact, without RSA it is likely that the economy would be in a worse position than it is presently. Employment would have been lower without the investments undertaken with the help of RSA, and it is likely that businesses would not have modernised or upgraded their skills and processes to the same extent.**

# 1 Introduction

The aim of this report is two-fold; firstly to provide an analysis of the impact of Regional Selective Assistance (RSA)[1] on employment and turnover growth in Scotland over the post-2007 period, and secondly, to provide a comparator set of results against which to benchmark the performance of Northern Ireland firms in receipt of Selective Financial Assistance (SFA).

The analysis is conducted in two parts; firstly a descriptive analysis of the offers and payments made to firms is undertaken, along with an analysis of Scottish RSA-Assisted firms versus Scottish non-assisted firms, to examine the differences in the underlying characteristics of each set of firms, as well as their growth rates. Following this an econometric analysis of the data is undertaken, which seeks to estimate whether RSA has any impact on growth, and if so, to quantify the extent of the impact. The latter analysis allows for comparisons to be drawn against the findings from the NI SFA analysis.

## *1.2 Regional Selective Assistance*

RSA is the main national scheme of financial assistance to industry in Scotland. It provides discretionary grants to investment projects that will create and safeguard employment in the Assisted Areas designated for regional aid under European Community law. It also includes 'Tier 3' assistance in other designated areas where support is offered to Small and Medium-sized Enterprises (SMEs), delivered under the EC's General Block Exemption Regulations.

RSA encourages businesses to undertake investment that will directly result in the creation or safeguarding of jobs in Scotland. Both indigenous and foreign companies can apply. RSA is a discretionary grant scheme, so there are a number of criteria to be met for an application to be successful. The amount offered is dependant on the size of business, location of the project and an assessment of how much is needed for the project go ahead. Depending on the size and location of companies, RSA grants of up to 35% of a company's total eligible investment project cost can be provided[2]. For example, in 2012/13, companies accepted 118 offers of RSA totalling £43 million relate to investment projects with planned capital expenditure of £216 million.

Payment of RSA is made in instalments, typically over several years as job and capital expenditure targets are met.

# 2 Data Sources and Matching

The data for the analysis was provided by Scottish Enterprise and included details of RSA offers and payments made to firms. The offer data covered the period 1st January 2004 to 20th May 2013 and related to 1,234 offers with a total value of £549m. The payments data covered the period between 1st October 2004 to 31st October 2012 and

[1] http://www.scottish-enterprise.com/fund-your-business/rsa.aspx
[2] http://www.scottish-enterprise.com/fund-your-business/rsa/rsa-how-much.aspx

reflected payments made to 693 companies for 778 projects. The total value of payments was £243m[3].

The first step before undertaking any analysis was to match the payments data to the Business Structure Database (BSD)[4]. This official UK Government dataset is provided by the Office for National Statistics (ONS) and covers all businesses in the UK registered for VAT and PAYE; records are currently available from 2007 to 2011. Matching the payments data into the BSD allows for pre- and post-assistance performance to be analysed, as well as an examination of the characteristics of both RSA assisted and non-assisted businesses, in terms of size, age, sector and ownership.

Of the total 693 firms, there were 167 with no IDBR reference numbers attached, and thus no way of matching them into the BSD[5]. These 167 firms accounted for 187 projects, with payments worth a total value of £65.2m. Excluding those with no reference numbers left a total of 526 firms, accounting for 591 projects with total payments of £177.8m (73% of the total).

As the 591 projects were spread across 526 firms this indicates that a small number of firms received RSA funding for more than one project over the entire period, and in fact the maximum number of projects was 4 per firm[6].

Linking the 526 firm level records to the BSD provided a match for 496 of them (94%). The remaining 30 that were not linked may be due to timing issues (there may be a lag before they show up with employees on the BSD) or due to the fact that they are not recorded within the private sector[7].

The 496 firms that were matched to the BSD had payments totalling £168.6m which was equal to 95% of the total value of payments for all those with reference numbers (and 69% of the total value of offers for all 693 firms). The rate of matching for those with reference numbers was extremely high with 94% of firms matched covering 95% of the value of payments; typically a matching rate of 80% or above is acceptable.

The firm-level version of the BSD allocates a firm, and all its associated employment, to the address of its UK head office. The head office refers to a company's registered location in the UK for VAT and PAYE purposes; it does not reflect the location or nationality of the ownership. Examining the location of the 496 matched firms reveals that 422 had UK head offices in Scotland, and 74 had head offices elsewhere in the UK. In fact 32 of these 74 had head offices in London or the South East. In terms of

[3] Although the offers data was provided up to 2013, only those between 2004-12 were included within the analysis.
[4] Initially only the payments data was available and was matched into the BSD; the offers data contained project reference numbers and was matched into the dataset at a later stage.
[5] The BSD is an anonymised dataset; firms can be matched in via their enterprise reference number which is sourced from the IDBR. Non-matches can be due to timing issues; incorrect names and/or addresses; and firms being below the threshold to register for VAT. We are grateful to the Scottish Government for attaching the enterprise reference numbers to the RSA data.
[6] Note that these are the number of unique projects; those with more than one represent different investment projects within the same firm. It is also the case that project offers can be paid out across many years; where this happens the project is still counted as one.
[7] The longitudinal version of the BSD that we have constructed only covers firms within the private sector which is defined as those in sectors 15-74; 90-93 of the SIC 92 classification.

ownership 338 of the 496 firms were under Scottish ownership; a further 57 had owners elsewhere in the UK and the remaining 101 were owned outside the UK.

The total value of payments for the 422 firms with head offices in Scotland was £98.9m which was equal to 56% of the total value for those with reference numbers (and 41% of the total value of payments for all 693 firms). In terms of their ownership 334 were Scottish; 23 were UK owned and 65 were owned outside the UK.

We proceed with the analysis based on the 422 firms located in Scotland[8]. This allows us to use the remaining Scottish firms as a non-assisted control group against which we can compare performance[9].

## 3 Descriptive Analysis

### *3.1 Analysis of RSA offers and payments*

RSA assistance was provided to firms under a number of categories[10]; Table 1 shows that Modernisation or Expansion within Scotland[11] and New Projects on Existing Sites were the most common type of assistance, each accounting for more than one third of total projects. New Facilities by Existing Companies accounted for around one tenth of all projects, as did new Start-ups. Less than five per cent of all RSA projects were for Relocations from Elsewhere in the UK.

The majority of the firms that received RSA assistance (79%) were Scottish owned. Those with owners outside Scotland were involved mostly with Modernisation/Expansion. Almost 90% of Relocation projects and Start-ups were by Scottish owned firms.

The total value of payments for all projects was £98.8m, of which the lion's share went to projects for Modernisation/Expansions within Scotland. Just under one third of the total was offered for New Projects on Existing Sites, and around half of this share for New Facilities. Assistance for Relocations and Start-ups both accounted for 7 per cent of the total payments.

[8] For consistency reasons we restrict the analysis to the region of Scotland only and thus this excludes those firms that are categorised as having their head office located in other parts of the UK.
[9] Appendix One details some important issues when working with the BSD and outlines alternative ways of performing the analysis.
[10] A number of firms had several projects funded by RSA; the maximum being four per firm, hence the number of projects is greater than the number of firms.
[11] Note that the number of projects under Management Buy Out/In were fewer than ten and as such could not be displayed separately due to ONS disclosure rules.

**Table 1: RSA Projects by Type and Value of Payments 2004-12**

| | Firms | Scottish Owned | Projects | Share | Value | Share |
|---|---|---|---|---|---|---|
| | N | % | N | % | £m | % |
| Management Buy out/in Modernisation/Expansion within Scotland | 161 | 72 | 175 | 37.2 | 42.0 | 42.5 |
| New Facility set up by Existing Company | 40 | 78 | 44 | 9.3 | 14.5 | 14.7 |
| New Project on Existing Site | 151 | 83 | 182 | 38.6 | 29.0 | 29.4 |
| Relocation from elsewhere in the UK | 18 | 89 | 18 | 3.8 | 6.8 | 6.9 |
| Start-up | 52 | 88 | 52 | 11.0 | 6.4 | 6.5 |
| | | | | | | |
| Total | 422 | 79 | 471 | 100.0 | 98.8 | 100.0 |

Source: Scottish Enterprise & ONS

Of the total number of firms, the majority received assistance for one type of project only, with just 40 firms being assisted for two or more projects. The average amount paid out for each project was £209,800 (Table 2). More than half of those firms that were assisted had fewer than 50 employees[12]; however they received just £25m of payments, which was around one quarter of the total. The average value of payments received by these smaller firms was £94,600 which was also around one quarter the average size for the larger firms, at £371,400. The majority of firms in receipt of payments were Scottish-owned; they received £62m in total. There were just 88 non-Scottish owned firms[13], they were in receipt of payments worth £37m; due to their smaller number, the average offer received by these firms, of £379,100 was more than twice that for the Scottish-owned firms.

**Table 2: RSA Payments by Type of Firm 2004-2012**

| | All | | <50 Emp[12] | | >=50 Emp | | Scottish-owned | | Non-Scottish owned | |
|---|---|---|---|---|---|---|---|---|---|---|
| | N | Value | N | Value | N | Value | N | Value | N | Value |
| | | £m | | £m | | £m | | £m | | £m |
| 1 Project only | 382 | 82.5 | 223 | 21.5 | 132 | 55.2 | - | - | - | - |
| 2+ Projects | 40 | 16.3 | 19 | 3.4 | 20 | 11.3 | - | - | - | - |
| Total | 422 | 98.8 | 242 | 24.9 | 152 | 66.5 | 334[14] | 62.4 | 88 | 36.8 |
| | | | | | | | | | | |
| Avg value of payment per project (£000s) | | 209.8 | | 94.6 | | 371.4 | | 166.7 | | 379.1 |

Source: Scottish Enterprise & ONS

[12] Note that size refers to employment size in 2011; not all firms were alive in 2011 hence the numbers do not add to the totals given in the columns for 'All firms'.

[13] Note that the number of non-Scottish owned firms with more than one project was less than 10 and thus could not be shown separately under ONS disclosure rules.

[14] Due to a cell count of less than ten for the non-Scottish owned firms with 2+projects the payment values cannot be disclosed.

The period of interest for this study is 2004-12. The offer data reveals that a total of £122m was offered to the 422 firms during this time. The majority of offers were accepted in the earlier part of the period, from 2004-07, whereby 296 offers were accepted by 282 firms; the total value of these offers was £73.3m which was 65% of the total. (Table 3). Overall, the mean offer was £272,000 whilst the overall median offer was less than half this at £120,000.

**Table 3: RSA Assistance by Year Offer Accepted 2004-2012**

| | Firms | Project Offers | Offer Value | Share | Mean Offer | Median Offer |
|---|---|---|---|---|---|---|
| | N | N | £m | % | £000s | £000s |
| 2004 | 81 | 81 | 16.6 | 14.7 | 207.5 | 122.5 |
| 2005 | 81 | 81 | 18.6 | 16.5 | 229.6 | 91.0 |
| 2006 | 66 | 72 | 21.5 | 19.1 | 321.3 | 120.0 |
| 2007 | 54 | 62 | 16.5 | 14.7 | 337.7 | 85.0 |
| 2008 | 30 | 39 | 17.6 | 15.6 | 566.8 | 180.0 |
| 2009 | 31 | 38 | 10.6 | 9.4 | 352.8 | 95.0 |
| 2010 | 43 | 50 | 11.2 | 9.9 | 243.0 | 130.0 |
| 2011-12 | 36 | 48 | 9.5 | 7.8 | 317.0 | 122.5 |
| | | | | | | |
| Total | 422 | 471 | 122.1 | 100.0 | 272.0 | 120.0 |

Source: Scottish Enterprise & ONS

Firms received their payments in stages, often drawing down the payments across a number of years (Table 4). As a result there were 804 unique payment instalments for the 422 firms and, as mentioned above, whilst offers were predominantly given before 2008, the majority of payments were actually received between 2008-12. The average payment was £123,000; payments peaked at £156,000 in 2010, and fell back to around £134,000 in 2012. The overall median value of payments was £100,000, although in each individual year the median payment generally ranged from £50,000-80,000.

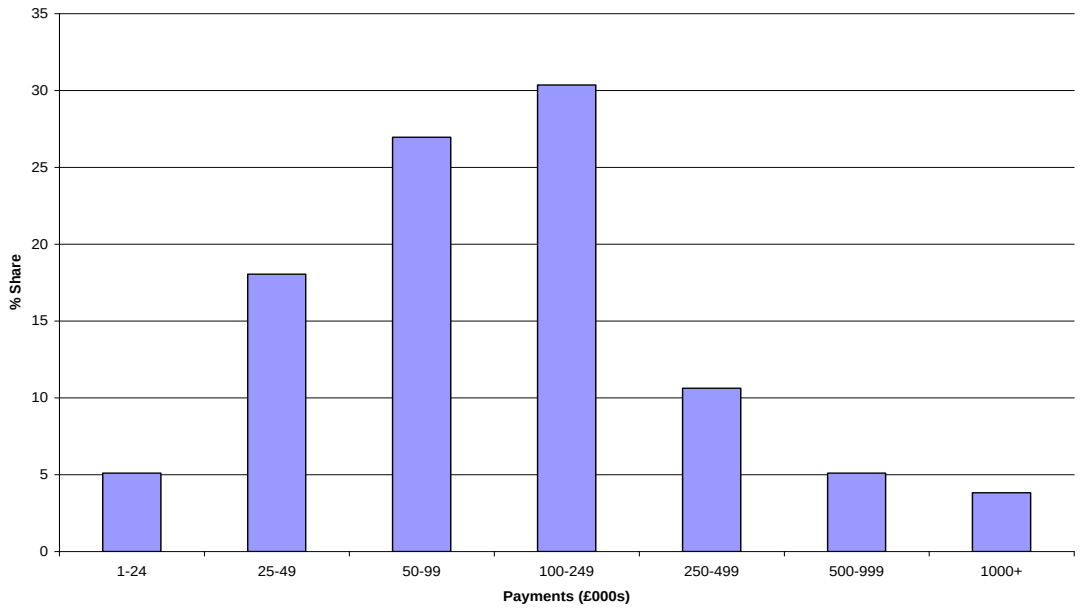
**Table 4: RSA Assistance by Year of Payment 2004-2012**

| | Payments | Cum Total Firms | Value Payments | Mean Value | Median Value |
|---|---|---|---|---|---|
| | N | N | £m | £000s | £000s |
| 2004 | 29 | 29 | 2.0 | 69.6 | 50.0 |
| 2005 | 59 | 78 | 7.1 | 120.1 | 80.0 |
| 2006 | 122 | 166 | 12.7 | 104.1 | 57.5 |
| 2007 | 126 | 224 | 13.1 | 103.9 | 50.0 |
| 2008 | 105 | 271 | 12.8 | 122.3 | 50.0 |
| 2009 | 94 | 312 | 12.5 | 132.6 | 77.5 |
| 2010 | 76 | 343 | 11.8 | 155.7 | 55.0 |
| 2011 | 103 | 394 | 14.6 | 142.2 | 65.0 |
| 2012 | 90 | 422 | 12.1 | 134.3 | 60.0 |
| | | | | | |
| Total | 804 | 422 | 98.8 | 122.8 | 100.0 |

Source: Scottish Enterprise & ONS

The distribution of RSA payments is further illustrated in Figure 1; around 80% of payments were less than £250,000 and, in fact, more than half of all payments ranged between £50,000-250,000. Around 5% of payments were less than £25,000 whilst at the other end of the scale, less than 5% were £1 million or more.

**Figure 1: RSA Payments by Firm Employee Sizeband 2004-12**




Source: Scottish Enterprise & ONS

### *3.2 Firm-level Characteristics*

We compare RSA-assisted firms against non-assisted firms in Scotland in order to examine whether there are any differences in their background characteristics. The characteristics are all based on data drawn from the BSD as at 2011; as such the number of firms is reduced as it reflects only those that were in operation in 2011 and for whom ownership data was held. Table 5 displays the number of firms and employees by broad size-band. Assisted firms were typically larger, with over two fifths of them having 50 or more employees; in contrast, just 2 per cent of non-assisted firms were in this size-band, and in fact almost 90% of the non-assisted had fewer than 10 employees. The distribution of employees was slightly more comparable in that the majority of employees were in the 50+ size-band for both groups, at 94 per cent for assisted firms and 66 per cent for non-assisted.

**Table 5: Size Distribution of RSA-Assisted and Non-Assisted Firms as at 2011**

| size | Assisted Firms | | | | | Non-Assisted Firms | | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % | Employees | % | | N | % | Employees | % |
| 0-9 | 58 | 16.2 | 294 | 0.4 | | 84,660 | 86.1 | 212,323 | 16.9 |
| 10-19 | 69 | 19.3 | 1,030 | 1.5 | | 7,492 | 7.6 | 101,811 | 8.1 |
| 20-49 | 80 | 22.4 | 2,656 | 3.9 | | 3,825 | 3.9 | 115,578 | 9.2 |
| 50+ | 151 | 42.2 | 63,567 | 94.1 | | 2,407 | 2.4 | 829,750 | 65.9 |
| | | | | | | | | | |
| Total | 358 | 100.0 | 67547 | 100.0 | | 98,384 | 100.0 | 1,259,462 | 100.0 |

Source: Scottish Enterprise & ONS

The breakdown by age also reveals distinct differences between the two groups of firms (Table 6); assisted firms were older, with around 60 per cent aged ten years or older and just 15 per cent aged under five in 2011. In contrast, almost half of the non-assisted were younger than five years old whilst only one third were aged over ten. As before, the distribution of employees was more consistent between the two groups of firms, with the majority of employees in the oldest firms.

**Table 6: Age Distribution of RSA-Assisted and Non-Assisted Firms as at 2011**

| Age | Assisted Firms | | | | | Non-Assisted Firms | | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % | Employees | % | | N | % | Employees | % |
| 0-4 | 54 | 15.1 | 3,029 | 4.5 | | 44,552 | 45.3 | 169,820 | 13.5 |
| 5-9 | 86 | 24.0 | 6,402 | 9.5 | | 20,612 | 20.9 | 136,257 | 10.8 |
| 10+ | 218 | 60.9 | 58,116 | 86.0 | | 33,220 | 33.8 | 953,385 | 75.7 |
| | | | | | | | | | |
| Total | 358 | 100.0 | 67,547 | 100.0 | | 98,384 | 100.0 | 1,259,462 | 100.0 |

Source: Scottish Enterprise & ONS

In general, government assistance is usually targeted to support certain key sectors, so we would expect to see a different sectoral make-up between the RSA-assisted and non-assisted firms. Table 7 shows that in fact around three fifths of RSA-assisted firms were in Manufacturing and a further fifth in Real Estate, Renting and Business Activities. In contrast, of the non-assisted just 7 per cent were in Manufacturing whilst just over one third was in the latter. Wholesale and Retail accounted for the second largest concentration of non-assisted firms at 20%, but comprised just 8% of the assisted.

In terms of employee composition, there were similarities between the assisted and non-assisted; Construction accounted for less than 10 per cent of total employment for both groups whilst Wholesale and Retail comprised around 20%. The key difference was again in Manufacturing whereby the sector accounted for 34% of all employment in assisted firms but just 12% of the non-assisted.

**Table 7: Sectoral Distribution of RSA-Assisted and Non-Assisted Firms 2011**

| sector | Assisted Firms | | | | | Non-Assisted Firms | | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % | Employees | % | | N | % | Employees | % |
| Manufacturing | 213 | 59.5 | 23,110 | 34.2 | | 6,782 | 6.9 | 146,446 | 11.6 |
| Construction | 13 | 3.6 | 6,338 | 9.4 | | 11,504 | 11.7 | 85,762 | 6.8 |
| Wholesale & Retail | 30 | 8.4 | 13,480 | 20.0 | | 19,816 | 20.1 | 201,671 | 16.0 |
| Hotels and Restaurants | - | - | - | - | | 10,286 | 10.5 | 111,613 | 8.9 |
| Financial Intermediation | - | - | - | - | | 1,047 | 1.1 | 218,787 | 17.4 |
| Real Estate, Renting and Business Activities | 78 | 21.8 | 8,242 | 12.2 | | 34,824 | 35.4 | 237,888 | 18.9 |
| Other Services | 24 | 6.7 | 16377 | 24.2 | | 14,125 | 14.4 | 257,295 | 20.4 |
| | | | | | | | | | |
| Total | 358 | 100.0 | 67,547 | 100.0 | | 98,384 | 100.0 | 1,259,462 | 100.0 |

Source: Scottish Enterprise & ONS

Again, as perhaps would be expected, a greater share of assisted firms were foreign-owned[15]; at 27 per cent compared to just 5 per cent of non-assisted firms (Table 8). Despite this, the share of employees by ownership was quite similar between the two groups; with the majority of employees working in foreign-owned firms. In fact although just 5 per cent of non-assisted firms were foreign-owned they accounted for 56 per cent of all employees.

**Table 8: Ownership Breakdown of RSA-Assisted and Non-Assisted Firms 2011**

| ownership | Assisted Firms | | | | | Non-Assisted Firms | | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | % | Employees | % | | N | % | Employees | % |
| UK-owned | 260 | 72.6 | 27,103 | 40.1 | | 93,067 | 94.6 | 557,532 | 44.3 |
| Non-UK-owned | 98 | 27.4 | 40,444 | 59.9 | | 5,317 | 5.4 | 701,930 | 55.7 |
| | | | | | | | | | |
| Total | 358 | 100.0 | 67,547 | 100.0 | | 98,384 | 100.0 | 1,259,462 | 100.0 |

Source: Scottish Enterprise & ONS

### *3.3 Growth Rates*

Turning to the growth performance of firms we examine, for the RSA-assisted, those in receipt of offers prior to the period of growth, so for example examining growth between 2007 and 2011 we include only those that received assistance between 2004-06[16]. Over the 2007-11 period both sets of firms grew (Table 9); the assisted by around 3% pa compared to a rate of just 0.4% pa for the non-assisted, which is somewhat surprising given the economic backdrop of the period. Within both groups the UK-owned performed best with rates of growth of 2-4% pa; the assisted firms having the stronger growth. However, employment within non-UK owned firms decreased over the period with the assisted firms experiencing a faster rate of decline than the non-assisted.

**Table 9: Growth Performance of RSA-Assisted and Non-Assisted Firms 2007-2011**

| | Assisted (offers accepted before 2007) | | | | Non-Assisted | | |
|---|---|---|---|---|---|---|---|
| | All | UK-owned | Non-UK owned | | All | UK-owned | Non-UK owned |
| **n** | **171** | **144** | **27** | | **81,999** | **70,946** | **11,053** |
| Employee 2007 | 20,005 | 15,045 | 4,960 | | 1,195,613 | 394,294 | 801,319 |
| Employee 2011 | 22,224 | 17,539 | 4,685 | | 1,213,969 | 422,695 | 791,274 |
| **growth rate pa (%)** | **2.7** | **3.9** | **-1.4** | | **0.4** | **1.8** | **-0.3** |

Source: Scottish Enterprise & ONS

Looking at the more recent 2010-11 period[17] reveals that employment within both sets of firms fell (Table 10); the assisted falling by 2.4% which was slightly higher than that for the non-assisted, with a 1.5% decline. Within the assisted group of firms the

[15] The BSD does not split UK ownership into its constituent countries so we cannot distinguish Scottish-owned firms.

[16] We use the same methodology in the econometric analysis, whereby restricting the offers of assistance prior to the period of growth allows for a causal link to be established.

[17] We examine the 2007-11 and 2010-11 periods to be consistent with the analysis undertaken for SFA in NI.

UK-owned had a larger drop in employment whilst for the non-assisted it was the non-UK owned that fared worst.

**Table 10: Growth Performance of RSA-Assisted and Non-Assisted Firms 2010-2011**

| | Assisted (offers accepted before 2010) | | | | Non-Assisted | | |
|---|---|---|---|---|---|---|---|
| | **All** | **UK-owned** | **Non-UK owned** | | **All** | **UK-owned** | **Non-UK owned** |
| **n** | **295** | **252** | **43** | | **119,622** | **107,237** | **12,385** |
| Employee 2010 | 39,827 | 29,043 | 10,784 | | 1,359,465 | 535,768 | 823,697 |
| Employee 2011 | 38,880 | 28,292 | 10,588 | | 1,339,194 | 529,134 | 810,060 |
| **growth rate (%)** | **-2.4** | **-2.6** | **-1.8** | | **-1.5** | **-1.2** | **-1.7** |

Source: Scottish Enterprise & ONS

### *3.4 Growth Pre- and Post-Assistance*

In order to analyse whether there is any difference in growth before and after accepting an offer of assistance, we separate the assisted firms into those who accepted one offer and who had a full run of employment data in the years prior to and post-receipt of this offer[18]. Table 11 shows the growth rates for those firms that accepted offers between 2005-07[19] and displays their pa growth rates for different periods pre- and post-assistance.

The results show that the period under observation is of key importance, and that the results can change depending on the time-span. For example, for those firms that accepted offers in 2005 if we look at their growth rate over the previous 6 years we see that it was 4.7% pa whereas after accepting the offer their growth rate fell to 0.6% pa. However if we look at growth for the 4 years prior and post-offer acceptance we see that it rose from 1.8% pa beforehand to 4.8% afterwards. We must also be mindful of the wider economic conditions of the periods in question, particularly after 2008, and also be careful of attributing any growth solely to receipt of RSA[20].

Bearing this in mind there does appear to be differences in the growth rates pre- and post-assistance. For those that accepted offers in 2005, growth in the 2, 3 and 4 year periods after accepting the offer was higher than it was beforehand. Likewise for those accepting offers in 2006, per annum growth was higher in the 2 year, 3 year and 5 year periods after acceptance of the offer. For the group of firms that accepted offers in 2007 the only improvements in growth after assistance was for the 2007-2009 period.

[18] Our data starts in 2004 however we cannot determine whether the offers in 2004 were the first offer the firm accepted, so use 2005 as our starting point.
[19] The number of firms that accepted offers in 2008 or thereafter, and that had full employment data for at least four years either side was too low to permit any meaningful analysis.
[20] We add controls to the regression models to take account of the wider economic performance of sectors in order to isolate the impact of RSA from general growth in the economy.

**Table 11: Pre- and Post- Assistance Employment Growth Rates**

| **Offer Accepted in 2005 (n=34)**[21] | | | **Offer Accepted in 2006 (n=29)** | | | **Offer Accepted in 2007 (n=36)** | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **6 yr growth** | **%** | | | | | | |
| ***Pre:*** pa growth rate 99-05 | 4.7 | | | | | | |
| ***Post:*** pa growth rate 05-11 | 0.6 | | | | | | |
| | | | | | | | |
| **5 yr growth** | | | **5 yr growth** | **%** | | | |
| ***Pre:*** pa growth rate 00-05 | 5.0 | | ***Pre:*** pa growth rate 01-06 | 0.4 | | | |
| ***Post:*** pa growth rate 05-10 | 1.3 | | ***Post:*** pa growth rate 06-11 | 1.4 | | | |
| | | | | | | | |
| **4 yr growth** | | | **4 yr growth** | | | **4 yr growth** | **%** |
| ***Pre:*** pa growth rate 01-05 | 1.8 | | ***Pre:*** pa growth rate 02-06 | 3.4 | | ***Pre:*** pa growth rate 03-07 | -0.3 |
| ***Post:*** pa growth rate 05-09 | 4.8 | | ***Post:*** pa growth rate 06-10 | 2.4 | | ***Post:*** pa growth rate 07-11 | -2.6 |
| | | | | | | | |
| **3 yr growth** | | | **3 yr growth** | | | **3 yr growth** | |
| ***Pre:*** pa growth rate 02-05 | 0.1 | | ***Pre:*** pa growth rate 03-06 | -2.2 | | ***Pre:*** pa growth rate 04-07 | -0.5 |
| ***Post:*** pa growth rate 05-08 | 4.8 | | ***Post:*** pa growth rate 06-09 | 5.0 | | ***Post:*** pa growth rate 07-10 | -1.1 |
| | | | | | | | |
| **2 yr growth** | | | **2 yr growth** | | | **2 yr growth** | |
| ***Pre:*** pa growth rate 03-05 | 1.5 | | ***Pre:*** pa growth rate 04-06 | -2.2 | | ***Pre:*** pa growth rate 05-07 | -2.6 |
| ***Post:*** pa growth rate 05-07 | 5.9 | | ***Post:*** pa growth rate 06-08 | 3.1 | | ***Post:*** pa growth rate 07-09 | 2.2 |

Source: Scottish Enterprise & ONS

# 4 Econometric Analysis

## *4.1 Introduction*

In order to try and establish whether RSA assistance has any impact on firm performance we run a series of models to ascertain the causal impact of RSA assistance on employment growth, turnover growth and productivity growth. We use two different measures of assistance to try and pinpoint how RSA has an effect i.e. is it the value of payments or merely that they are assisted that has an effect (we also control for being an Account Managed client[22]). We run the models over two time periods 2007-11 and 2010-11; and separately for UK-owned and non-UK owned firms.

We employ Ordinary Least Squares (OLS)[23] and Propensity Score Matching Techniques (PSM)[24] as our preferred methods. The latter being used to account for

[21] Note that there were 70 firms that accepted an offer in 2005 and that had only one offer, however the number reduced to 34 by including only those with employment every year over the period. The respective number for 2006 was 58 firms, reducing to 29 and 51 firms in 2007, reducing to 36.

[22] Scottish Enterprise account manages around 2000 companies, with each having a dedicated relationship manager

[23] OLS is a technique that is used to model linear relationships between variables. OLS fits a straight line to a sample of data by minimising the sum of the squares of the deviations of the data from the line. In this case it allows us to analyse whether a collection of independent variables influences growth and quantifies the magnitude of the relationship.

[24] PSM is a statistical matching technique that attempts to estimate the effect of a treatment by accounting for the variables that predict receiving the treatment. The method matches firms that received the treatment, to those with similar propensity scores (that did not receive the treatment) to produce a comparison group of firms who would be equally likely to have received treatment, based on

selection bias and endogeneity, which are common problems in the field of evaluation. We include a range of control variables in the model, to include other firm characteristics, along with external controls such as degree of market concentration, location and sectoral growth. Table 12 displays the list of variables included in the models.

The dependent variable in the model(s) is the log growth in employment (or turnover or productivity). We transform the variables into logs to stabilise the variance of the data and also to allow the coefficients to be interpreted as elasticities. We measure assistance firstly as a dummy variable to indicate that a firm either has or hasn't received RSA payments. We would expect to see a positive sign on the assistance dummy, suggesting that being in receipt of RSA assistance has a positive impact on growth. The log value of RSA payments and offers is used as alternative measures of assistance; again we would expect the sign on the variables to be positive, suggesting that the higher the payments, or offers, received the higher the growth.

Of the other control variables we use employment or turnover in the first year of the growth period as a measure of size, we would hypothesise that the sign on the coefficient would be negative, suggesting that smaller firms have higher growth. The age of the firm would also be expected to be negative suggesting younger firms have higher growth. The foreign-owned dummy could be either positive or negative, we would normally expect foreign-owned firms to be associated with higher growth, particularly productivity growth, as they may have access to more advanced techniques or machinery, however the growth rate tables above showed that foreign-owned firms were associated with lower employment growth, so the sign could be negative for employment growth. The value of wages may provide an indication of the value or quality of the product/services provided thus we would expect to find a positive correlation between wages and growth.

For the external control variables we include growth rates in output for key sectors (using 'other services' as the base case) which have been constructed from the national GDP statistics[25]. We use these variables to control for the economy-wide performance of the sectors which allows us to further try and isolate the impact of assistance from that of demand in the economy. We would expect to see negative coefficients for the Production and Wholesale/Retail sectors in particular, given the period under observation. The Herfindahl index is also included as a means of measuring the degree of market concentration within a sector. A low score suggests a highly competitive sector with many firms, whilst a high score suggests a more concentrated sector with few firms. Given that the economy was in recession during the period of the analysis we may expect the coefficient on the Herfindahl index to be positive, in that those sectors with few competitors were able to grow faster. Further external controls include geographic dummies for Edinburgh and Glasgow; we might expect growth to be higher in these cities than in the rest of Scotland due to population size and clustering of business activities, we might also expect a large

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their background characteristics. Bias is reduced because both sets of firms had an equal probability of belonging to the treatment group, therefore any difference in performance is due to the treatment only and not due to differences in variables which may have influenced selection into the treatment.

[25] http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/GDP2012Q4/GSP2012Q4XLS

share of the RSA-assisted firms to be located here, thus we control for these cities in order to separate the geographical impact from that of the actual assistance.

**Table 12: List of Variables**

| Variable Name | Description |
|---|---|
| | |
| RSA-assistance | Whether in receipt of RSA Assistance (1/0 dummy variable) |
| RSA-offers | Log value of RSA Offers made |
| RSA-payments | Log value of RSA Payments made |
| AM | Whether Account-Managed Client (1/0) dummy |
| AM-RSA | Interaction variable to show received RSA and is Account Managed Client (1/0 dummy) |
| Employment 2007 / 2010 | Log value of employment 2007 or 2010 |
| Turnover 2007 / 2010 | Log value of turnover 2007 or 2010 |
| Productivity 2007 / 2010 | Log value of productivity (turnover/employee) 2007 or 2010 |
| Age | Age of firm in 2011 |
| Foreign-owned | Whether non-UK owned (1/0 dummy variable) |
| Production Sector Growth | Log growth in output for the Production sector |
| Wholesale/Hotel Sector Growth | Log growth in output for the Wholesale & Retail; Hotels and Restaurants Sectors |
| Transport Sector Growth | Log growth in output for the Transport Sector |
| Finance & Business Sector Growth | Log growth in output for the Financial Intermediation; Real Estate, Renting & Business Activities Sectors |
| HHI 2007 / 2010 | Herfindahl index of market concentration 2007/ 2010 (based on turnover per 2 digit SIC sector) |
| Glasgow | Whether in the Glasgow (G) postcode area (1/0 dummy variable) |
| Edinburgh | Whether in the Edinburgh (EH) postcode area (1/0 dummy variable) |
| Total Gross Wages | Log value of total gross wages at time of offer |
| Modernisation/Expansion | Modernisation/Expansion Project |
| New Facility Project | New Facility Project |
| New Project | New Project on Existing Site |
| Relocation | Relocation to Scotland Project |

### *4.2 Employment Growth Models*

We first run standard OLS regressions to look at the impact of RSA assistance on growth. We restrict the models to those firms that grew over the period, using the log of employment growth between 2007-11 as the dependent variable; assistance is a binary variable (i.e. received RSA or not) and is based on RSA payments received before 2007. The models are run separately for all firms; UK-owned and Foreign-owned (Table 13).

The models show that receipt of RSA assistance is positive and statistically significant in relation to employment growth overall and for UK-owned firms, indicating that RSA assistance improved the growth of firms in comparison to the non-assisted. Importantly, RSA assistance had an impact even after controlling for firms also being Account Managed.

Larger firms were also associated with growth, although the opposite was true for foreign-owned firms for whom smaller firms grew faster. The sign on the age

coefficient was negative indicating that younger firms have higher growth. Being foreign-owned was also associated with lower growth, which may reflect the fact that these firms were more exposed internationally and thus faced a greater downturn in demand. The only significant sectoral controls were for Production and Finance/Business; the former associated with lower growth, as expected, and the latter associated with higher employment growth (than the 'other service' sector). The Herfindahl Index, which controls for market concentration, showed that the more concentrated the industry sector, the higher the employment growth, as was hypothesised. The location variables furthermore indicated that firms located in Glasgow and Edinburgh had higher growth than their counterparts located elsewhere.

Despite these positive findings the R-squared for the overall model suggests that in total the model predicts less than 5% of the variance in employment growth, thus the explanatory power is weak. We would ideally include other variables which are likely to impact on growth, to include exporting and innovation behaviour; skills of the workforce and some controls for the managerial capability, however these variables are not available within the current datasets.

**Table 13: OLS Regression: The Impact of RSA on Employment Growth 2007-11**

| | All | UK-owned | Foreign-owned |
|---|---|---|---|
| | Log Growth 2007-11 | Log Growth 2007-11 | Log Growth 2007-11 |
| RSA-Assistance | 0.182*** | 0.183*** | 0.0986 |
| | (0.0335) | (0.0379) | (0.0823) |
| AM | 0.198*** | 0.238*** | 0.0476 |
| | (0.0476) | (0.0533) | (0.116) |
| Employment 2007 | 0.0419*** | 0.0441*** | -0.0676*** |
| | (0.00205) | (0.00221) | (0.00827) |
| Age | -0.0114*** | -0.0113*** | -0.0404*** |
| | (0.000407) | (0.000412) | (0.00572) |
| Foreign-owned | -0.0614*** | - | - |
| | (0.00847) | - | - |
| Production Sector Growth | -1.223*** | -1.228*** | -0.921 |
| | (0.226) | (0.232) | (1.540) |
| Wholesale & Hotel Sector Growth | 0.219 | 0.0874 | -3.202 |
| | (0.536) | (0.545) | (5.135) |
| Transport Sector Growth | -1.511 | -1.465 | 1.312 |
| | (1.051) | (1.077) | (7.262) |
| Finance & Business Sector Growth | 0.867*** | 0.894*** | 0.0298 |
| | (0.0521) | (0.0529) | (0.511) |
| HHI 2007 | 0.0390** | 0.0345* | 0.211* |
| | (0.0197) | (0.0203) | (0.127) |
| Glasgow | 0.00842** | 0.00863** | 0.0293 |
| | (0.00377) | (0.00385) | (0.0291) |
| Edinburgh | 0.0180*** | 0.0188*** | 0.00445 |
| | (0.00406) | (0.00415) | (0.0324) |
| Constant | 0.293*** | 0.290*** | 1.119*** |
| | (0.00519) | (0.00527) | (0.0811) |
| | | | |
| Observations | 58,638 | 56,529 | 1,041 |
| R-Squared | 0.026 | 0.026 | 0.151 |

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Source: Scottish Enterprise & ONS

A similar model is run for one year growth (Table 14); the dependent variable is the log of employment growth between 2010-11. In this model assistance is again a binary variable based on receipt of RSA payments before 2010.

The models again show a positive and significant effect from RSA on growth, overall and for foreign-owned firms, although the coefficients are lower than those in the 2007-11 models. Given that the actual growth rates (as shown in Table 10) were negative for all firms for this period, the models suggest that the performance of assisted firms would have been worse in the absence of RSA assistance. In this model there is no significant impact from being Account Managed, suggesting the impact is only felt over the longer term. The sign on the remaining control variables is similar to the 2007-11 model; with several of the sectoral growth controls now becoming statistically significant.

Caution is advised again however in terms of the usefulness of the model in explaining employment growth. The R-squared is too low to suggest that the model is a good overall predictor of growth, although it does confirm a positive and reliable relationship between RSA assistance and employment growth.

**Table 14: OLS Regression: The Impact of RSA on Employment Growth 2010-11**

| | All | UK-owned | Foreign-owned |
|---|---|---|---|
| | **Log Growth 2010-11** | **Log Growth 2010-11** | **Log Growth 2010-11** |
| RSA-Assistance | 0.0337** | 0.0240 | 0.0694* |
| | (0.0163) | (0.0181) | (0.0356) |
| AM | 0.0293 | 0.0302 | 0.0224 |
| | (0.0229) | (0.0255) | (0.0487) |
| Employment 2010 | 0.00904*** | 0.00939*** | 0.00829*** |
| | (0.000817) | (0.000870) | (0.00228) |
| Age | -0.00299*** | -0.00292*** | -0.0109*** |
| | (0.000131) | (0.000133) | (0.00117) |
| Foreign-owned | -0.0106*** | | |
| | (0.00371) | | |
| Production Sector Growth | -0.265 | -0.286 | -0.541 |
| | (0.199) | (0.204) | (0.955) |
| Wholesale & Hotel Sector Growth | 8.317*** | 8.830*** | -6.772 |
| | (0.847) | (0.859) | (5.384) |
| Transport Sector Growth | 4.295** | 3.824** | 11.69 |
| | (1.858) | (1.902) | (8.945) |
| Finance & Business Sector Growth | -0.301*** | -0.307*** | -0.0334 |
| | (0.0466) | (0.0472) | (0.314) |
| HHI 2010 | 0.00873 | 0.0104 | -0.0502 |
| | (0.0119) | (0.0122) | (0.0466) |
| Glasgow | 0.00670*** | 0.00666*** | 0.00102 |
| | (0.00148) | (0.00150) | (0.00828) |
| Edinburgh | 0.00543*** | 0.00573*** | -0.00899 |
| | (0.00161) | (0.00164) | (0.00864) |
| Constant | 0.0648*** | 0.0637*** | 0.173*** |
| | (0.00177) | (0.00180) | (0.0179) |
| Observations | 98678 | 95866 | 2812 |
| R-Squared | 0.009 | 0.009 | 0.041 |

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Source: Scottish Enterprise & ONS

### *4.3 Turnover Growth Models*

We run the same models this time substituting turnover growth for employment growth. Table 15 shows a similar effect, in that RSA assistance improved turnover growth overall, and for UK-owned firms, over the 2007-11 period. There was no impact for foreign-owned firms. Being Account Managed was positively related to growth, and had the same magnitude of impact as the RSA assistance. Size, measured here as turnover, indicated that the smaller the turnover the larger the growth whilst foreign-owned firms were also associated with higher turnover growth. This latter finding was in contrast to that in the employment models, whereby foreign-owned

firms had lower employment growth, suggesting productivity improvements in foreign-owned firms.

Each of the sectoral growth controls were statistically significant although only Transport and the Finance/Business sectors were negatively associated with turnover growth. The remaining control variables had similar signs to the employment models. Overall the explanatory power of the models was higher than those for the previous models, although they still only explained less than 10% of the variance in turnover growth.

**Table 15: OLS Regression: The Impact of RSA on Turnover Growth 2007-11**

| | **All** | **UK-owned** | **Foreign-owned** |
|---|---|---|---|
| | **Log Growth 2007-11** | **Log Growth 2007-11** | **Log Growth 2007-11** |
| | | | |
| RSA-Assistance | 0.265*** | 0.294*** | 0.0560 |
| | (0.0536) | (0.0599) | (0.122) |
| AM | 0.235*** | 0.322*** | -0.00316 |
| | (0.0769) | (0.0869) | (0.167) |
| Turnover 2007 | -0.102*** | -0.107*** | -0.0558*** |
| | (0.00218) | (0.00231) | (0.00693) |
| Age | -0.0142*** | -0.0132*** | -0.0693*** |
| | (0.000771) | (0.000776) | (0.00752) |
| Foreign-owned | 0.205*** | - | - |
| | (0.0149) | - | - |
| Production Sector Growth | 2.276*** | 2.392*** | 0.848 |
| | (0.427) | (0.441) | (1.940) |
| Wholesale & Hotel Sector Growth | 4.832*** | 4.477*** | 5.648 |
| | (1.039) | (1.054) | (6.200) |
| Transport Sector Growth | -6.542*** | -6.556*** | -9.051 |
| | (1.990) | (2.042) | (9.188) |
| Finance & Business Sector Growth | -0.429*** | -0.385*** | -0.901 |
| | (0.102) | (0.104) | (0.620) |
| HHI 2007 | 0.0714* | 0.0296 | 0.465*** |
| | (0.0385) | (0.0398) | (0.156) |
| Glasgow | 0.0267*** | 0.0261*** | 0.0319 |
| | (0.00733) | (0.00748) | (0.0356) |
| Edinburgh | 0.0402*** | 0.0381*** | 0.0721* |
| | (0.00792) | (0.00808) | (0.0384) |
| Constant | 1.122*** | 1.142*** | 1.711*** |
| | (0.0133) | (0.0137) | (0.114) |
| | | | |
| Observations | 43903 | 42035 | 1868 |
| R-Squared | 0.078 | 0.079 | 0.107 |
| Absolute value of t statistics in parentheses<br>* significant at 10%; ** significant at 5%; *** significant at 1% | | | |

Source: Scottish Enterprise & ONS

The one year model, examining growth over the 2010-11 period is shown in Appendix Two. Again the explanatory power of the model is quite poor, although it does reaffirm the existence of a relationship between RSA and growth.

### *4.4 Productivity Growth Models*

Similar models were run for productivity growth over the 2007-11 period, with productivity measured here as turnover per employee. As before the growth rates are measured in log changes, and RSA assistance is measured as a dummy variable (Table 16).

Unlike the previous models there is no statistical relationship found between RSA assistance and productivity growth, nor is any impact detected for being Account Managed. Size is positively associated with growth however initial productivity levels and age are negatively related, suggesting that younger firms and those with lower productivity levels have higher productivity growth.

Again the sectoral controls are all significant, with all but the Production sector associated with lower productivity growth. Unlike the previous models the Herfindahl index is negative, which suggests that productivity growth is associated with more competitive sectors, which makes sense both theoretically and intuitively, in that firms with many competitors have to increase productivity levels in order to remain competitive and stay in the marketplace. Finally the geographical controls are again both positive and significant.

The explanatory power of these models is around 10%, which is an improvement on the previous models for both employment and turnover growth. The model is still relatively poor in explaining growth, although it is interesting to note that it departs from the previous ones and suggests that there is no relationship between RSA and productivity growth over the five year period, although given that the aim of RSA is employment related, this is not surprising.

**Table 16: OLS Regression: The Impact of RSA on Productivity Growth 2007-11**

| | All | UK-owned | Foreign-owned |
|---|---|---|---|
| | Log Growth 2007-11 | Log Growth 2007-11 | Log Growth 2007-11 |
| | | | |
| RSA-Assistance | -0.0189 | -0.0636 | 0.0857 |
| | (0.0605) | (0.0679) | (0.143) |
| AM | 0.0909 | 0.156 | -0.115 |
| | (0.0871) | (0.0992) | (0.194) |
| Productivity 2007 | -0.200*** | -0.203*** | -0.152*** |
| | (0.00317) | (0.00326) | (0.0136) |
| Employment 2007 | 0.0121*** | 0.0157*** | -0.0127 |
| | (0.00329) | (0.00356) | (0.00930) |
| Age | -0.0131*** | -0.0127*** | -0.0736*** |
| | (0.000799) | (0.000804) | (0.00844) |
| Foreign-owned | -0.000825 | - | - |
| | (0.0145) | - | - |
| Production Sector Growth | 2.211*** | 2.292*** | 0.781 |
| | (0.427) | (0.441) | (1.911) |
| Wholesale & Hotel Sector Growth | -8.959*** | -9.443*** | 1.255 |
| | (1.058) | (1.072) | (6.217) |
| Transport Sector Growth | -11.98*** | -11.88*** | -11.95 |
| | (2.013) | (2.066) | (9.190) |
| Finance & Business Sector Growth | -0.912*** | -0.895*** | -0.972 |
| | (0.104) | (0.105) | (0.624) |
| HHI 2007 | -0.0665* | -0.105*** | 0.319** |
| | (0.0386) | (0.0398) | (0.160) |
| Glasgow | 0.0132* | 0.0113 | 0.0260 |
| | (0.00733) | (0.00747) | (0.0360) |
| Edinburgh | 0.0252*** | 0.0214*** | 0.0716* |
| | (0.00799) | (0.00816) | (0.0378) |
| Constant | 1.364*** | 1.371*** | 2.066*** |
| | (0.0166) | (0.0170) | (0.135) |
| | | | |
| Observations | 39961 | 38018 | 1943 |
| R-Squared | 0.098 | 0.101 | 0.107 |

Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Source: Scottish Enterprise & ONS

The one year model for 2010-11 is contained in Appendix Two; again no relationship is found between RSA and productivity growth. The model is quite similar to that above regarding the signs and significance levels of the coefficients.

### *4.5 Propensity Score Matching models*

The above analysis does not control for any selection bias which may be present within this type of analysis. That is, firms that ask for, or that are sought out to be offered assistance, may be those with already preferable characteristics and/or higher growth; alternatively they may poorer performing firms, whereby the assistance is being offered/sought to improve performance. In either case, without controlling for

this the above results may over-estimate (in the case of better firms) or under-estimate (in the case of poorer performing firms) the effect of assistance. The OLS also fails to control for endogeneity, whereby assistance may influence growth but growth in turn may influence the decision to seek further assistance. To solve these problems we would usually run a Heckman-type selection model which controls for selection as part of the estimation procedure, however, unfortunately we do not have sufficient variables to run this model with the limited data we have[26].

As an alternative we therefore use Propensity Score Matching models. These models provide an alternative method to control for selection and endogeneity bias, in that they construct, from the non-assisted group, a control group with the same statistical properties as those that received the assistance. Selection bias is reduced because both sets of firms had an equal probability of being assisted, therefore any difference in subsequent performance is due to the assistance only and not due to differences in variables which may have influenced selection into receipt of RSA.

The models are run only for those firms that grew over the period; due to this method the number of assisted firms for whom matches could be found was reduced to around 100, thus they cannot be further split into UK-owned and foreign-owned. Table 17 reports the coefficients for the assistance variables, based on the PSM models. The coefficients show the magnitude of the effect on growth, and whether they have a statistically significant impact or not. The results show that, after controlling for selection, that RSA assistance has a positive effect on both employment and turnover growth over the 2007-11 period but there is no impact on productivity growth (the sign is actually negative but there is no statistical significance). There is no impact detected for growth at all over the 2010-11 period.

The PSM method provides a more robust analysis than the OLS models above, and interestingly they show only a positive impact on employment and turnover growth for the longer 2007-11 period. This suggests that growth is best measured over a longer time frame, to allow for the effects of assistance to filter through. The results do confirm that RSA appears to have no impact on productivity growth; however this may be affected by the wider economic climate whereby over the period in question firms may have switched their priorities from productivity improvements to employment generation or maintenance. Analysis of an earlier period may have shown positive productivity improvements as a result of RSA.

[26] In order to properly specify this type of model, additional variables are required which can explain receipt of assistance but which have no impact on growth for example, share of equity held by the owner. Owning a greater share of the firm may incentivise the owner to seek out forms of support, but a high ownership share would not necessarily mean faster business growth. We were able to run these models on the Northern Ireland data using information from the bespoke survey to act as additional controls to help specify the model correctly.

**Table 17: Results of PSM Models on the Impact of RSA on Growth**

| Dependent Variable | All |
|---|---|
| **Employment Growth 2007-11** | 0.242*** |
| **Turnover Growth 2007-11** | 0.170** |
| **Productivity Growth 2007-11** | -0.153 |
| | |
| **Employment Growth 2010-11** | 0.027 |
| **Turnover Growth 2010-11** | 0.000 |
| **Productivity Growth 2010-11** | -0.064 |

Source: Scottish Enterprise & ONS

### *4.6 Impact from RSA Offers*

Despite the weak overall explanatory power of the models, the above analysis has shown evidence of a positive relationship between receipt of RSA assistance and employment and turnover growth. We would now like to estimate whether the actual amount of RSA has a similar effect, either through the total amount offered or the actual amount paid out. We firstly re-run the above models to include the value of offers made to firms, rather than including the binary variable for being assisted. We include the same controls as before, along with an additional firm-level variable which captures the value of wages, and dummy variables which denote the different types of project. As these models are assessing the impact of the RSA offers they include assisted firms only. The models are run on firms that grew over the period and that received offers before the period of growth; due to this methodology the number of firms included is reduced and thus the models are not run separately for UK-owned and Foreign-owned firms.

Table 18 shows that RSA offers, made prior to 2007, had a positive impact on employment growth and turnover growth over the 2007-11 period. In contrast, there was no impact on productivity growth. Being smaller, in terms of employment or turnover, was also associated with higher growth, although there was no impact from age, ownership or from being Account Managed. The location variables indicate that firms based in Glasgow had higher employment growth, but lower productivity growth than those based elsewhere in Scotland, whilst those located in Edinburgh had higher turnover and productivity growth. The turnover growth model also showed that growth was associated with more concentrated sectors, and in firms with higher wage bills. Those firms involved with establishing new facilities were also found to have lower turnover growth than Start-up projects.

## Table 18: OLS Regression: The Impact of RSA Offers on Growth 2007-11

| | Employment | Turnover | Productivity |
|---|---|---|---|
| | Log Growth 2007-11 | Log Growth 2007-11 | Log Growth 2007-11 |
| RSA-Offers | 0.195*** | 0.140** | 0.0619 |
| | (0.0620) | (0.0632) | (0.0559) |
| AM-RSA | 0.144 | 0.0329 | -0.0196 |
| | (0.109) | (0.113) | (0.0969) |
| Employment 2007 | -0.217*** | - | - |
| | (0.0547) | - | - |
| Turnover 2007 | - | -0.151*** | -0.105* |
| | - | (0.0436) | (0.0573) |
| Productivity 2007 | - | - | -0.0698 |
| | - | - | (0.0465) |
| Age | -0.0111 | -0.0227 | -0.0141 |
| | (0.0190) | (0.0203) | (0.0180) |
| Foreign-owned | -0.00213 | -0.128 | -0.0105 |
| | (0.167) | (0.171) | (0.139) |
| Production Sector Growth | -4.508 | -0.440 | 1.526 |
| | (6.262) | (6.824) | (6.282) |
| Wholesale & Hotel Sector Growth | 5.767 | -37.66 | -13.82 |
| | (29.71) | (33.80) | (30.22) |
| Transport Sector Growth | 3.851 | 35.75 | 9.372 |
| | (81.70) | (86.35) | (66.71) |
| Finance & Business Sector Growth | 0.978 | 3.207 | -0.913 |
| | (2.527) | (2.729) | (2.443) |
| HHI 2007 | -0.282 | 1.123** | 0.286 |
| | (0.507) | (0.524) | (0.319) |
| Glasgow | 0.236** | -0.181 | -0.164* |
| | (0.109) | (0.115) | (0.0968) |
| Edinburgh | 0.233 | 0.375* | 0.646*** |
| | (0.193) | (0.206) | (0.186) |
| Total Gross Wages | 0.0104 | 0.0372*** | 0.0105 |
| | (0.00996) | (0.0111) | (0.0100) |
| Modernisation/Expansion | 0.0377 | -0.341 | 0.00535 |
| | (0.184) | (0.210) | (0.181) |
| New Facility | 0.238 | -0.422* | 0.0566 |
| | (0.214) | (0.237) | (0.212) |
| New Project | 0.193 | -0.245 | -0.0565 |
| | (0.203) | (0.225) | (0.204) |
| Relocation | -0.164 | -0.208 | 0.125 |
| | (0.267) | (0.285) | (0.227) |
| Constant | -1.135 | 0.533 | 0.496 |
| | (0.710) | (0.679) | (0.673) |
| Observations | 134 | 142 | 114 |
| R-Squared | 0.304 | 0.442 | 0.363 |
| Absolute value of t statistics in parentheses<br>* significant at 5%; ** significant at 1% | | | |

Source: Scottish Enterprise & ONS

The model is re-run over the one year 2010-11 period; the results show no impact from RSA offers on growth (see Appendix Two, Table 3). This suggests that the impact of RSA offers is most effective on long term growth whereby there is a cumulative positive effect which cannot be seen in individual one year periods. Being jointly in receipt of RSA and Account Managed was found to have a positive impact on productivity growth and turnover growth, which was not seen in the earlier period. This may reflect the fact that the majority of the Account Managed firms in the dataset became so in 2006 or thereafter, and so had no real impact on the earlier 2007-11 growth model.

The one year and four year models using the RSA offer variable had better explanatory powers than the initial models which incorporated the binary assistance variable. The higher R-squared in these models, explaining up to 44% of the variation in growth, is due to the fact that firstly, the models were run only on the sample of those in receipt of RSA and thus the independent variables were collectively better at predicting growth than for the entire sample which included all Scottish firms. Secondly, the inclusion of additional independent variables, such as the wage information, and the types of project, also sought to increase the explanatory power of these models.

### *4.7 Impact from RSA Payments*

As an alternative to assessing the impact of offers on growth we would also like to estimate whether the actual amount of RSA paid out has a similar effect. We re-run the above models to include the value of payments made to firms, rather than the amount offered. The models are run on firms that grew over the period and that received payments before the period of growth; due to this methodology the number of firms included is relatively low, particularly for the 2007-11 model, as it was shown in Table 4 that most payments were received after 2008. As a result of the small number of observations again the models are not run separately for UK-owned and Foreign-owned firms.

Table 19 shows the resulting models for employment growth, turnover growth and productivity growth. They show that the amount of assistance paid to firms (prior to 2007) has no impact on growth. In this model there is also no impact from being jointly Account Managed and in receipt of RSA payments. The finding that RSA payments had no effect on growth is in direct contrast to the previous findings from the models using RSA offers and those using the binary assistance variable. However this could be a direct result of the fact that payments are given in stages, linked to employment creation/safeguarding targets, and as such the firm only have received a proportion of the total offer within the period in which we are measuring growth. This would also backup the significant effect found for the offers variable and would suggest that the offer triggers the firm into action, rather than the payment.

The only other control variables with any statistical significance include age, which is negative, implying that younger firms have higher turnover growth; and the Herfindahl Index, which is also negative suggesting higher employment growth amongst more competitive sectors. The geographical variables are significant; being located in Glasgow has a negative impact on turnover and productivity growth for assisted firms, whilst being located in Edinburgh has a positive effect on employment

growth. A number of the project types are also significant, suggesting that they are associated with lower turnover and employment growth than the Start-Up projects.

**Table 19: OLS Regression: The Impact of RSA Payments on Growth 2007-11**

| | Employment | Turnover | Productivity |
|---|---|---|---|
| | Log Growth 2007-11 | Log Growth 2007-11 | Log Growth 2007-11 |
| RSA-Payments | 0.00943 | -0.0752 | -0.0340 |
| | (0.0606) | (0.0660) | (0.0575) |
| AM_RSA | 0.0913 | 0.0900 | 0.00300 |
| | (0.109) | (0.117) | (0.0903) |
| Employment 2007 | -0.0676 | - | -0.0405 |
| | (0.0461) | - | (0.0401) |
| Turnover 2007 | - | -0.0480 | - |
| | - | (0.0418) | - |
| Productivity 2007 | - | - | 0.0556 |
| | - | - | (0.0520) |
| Age | -0.0190 | -0.0440** | -0.0213 |
| | (0.0170) | (0.0207) | (0.0169) |
| Foreign-owned | 0.199 | 0.185 | 0.174 |
| | (0.156) | (0.169) | (0.136) |
| Production Sector Growth | -5.579 | -2.836 | -3.446 |
| | (6.375) | (7.696) | (5.976) |
| Wholesale & Hotel Sector Growth | 27.06 | -21.50 | 3.386 |
| | (27.24) | (35.19) | (26.61) |
| Transport Sector Growth | 23.18 | -0.0392 | -15.56 |
| | (63.43) | (69.97) | (51.99) |
| Finance & Business Sector Growth | 1.490 | 0.315 | -1.844 |
| | (2.534) | (3.086) | (2.459) |
| HHI 2007 | -1.574* | 0.104 | 0.710 |
| | (0.824) | (0.882) | (0.624) |
| Glasgow | 0.136 | -0.311*** | -0.228** |
| | (0.100) | (0.111) | (0.0892) |
| Edinburgh | 0.416** | -0.00138 | 0.116 |
| | (0.207) | (0.287) | (0.214) |
| Total Gross Wages | -0.00305 | 0.0133 | 0.00405 |
| | (0.00935) | (0.0110) | (0.00933) |
| Modernisation/Expansion | -0.254* | -0.485** | -0.0134 |
| | (0.152) | (0.205) | (0.165) |
| New Facility Project | -0.190 | -0.506** | 0.134 |
| | (0.187) | (0.227) | (0.194) |
| New Project | -0.145 | -0.534** | -0.212 |
| | (0.169) | (0.212) | (0.188) |
| Relocation | -0.420* | -0.131 | 0.122 |
| | (0.213) | (0.269) | (0.194) |
| Constant | 1.049 | 2.741*** | 1.012 |
| | (0.704) | (0.718) | (0.663) |
| Observations | 92 | 91 | 81 |
| R-Squared | 0.321 | 0.511 | 0.415 |
| Absolute value of t statistics in parentheses<br>* significant at 5%; ** significant at 1% | | | |

Source: Scottish Enterprise & ONS

The same model is run for the 2010-11 period, with the value of payments received from 2004-09 included as the assistance variable (Appendix Two, Table 4). Again there is no significant impact at all for payments, suggesting that the value of the RSA paid out had no impact on growth over this period. Importantly the joint RSA-Account Managed dummy is significant, highlighting the effect of the overall package of support and suggesting, as in the results for the offers regressions, that the previous model possibly had too few observations of Account Managed firms prior to 2007 to pick up this effect. The effects from the other control variables are somewhat similar to the 5 year growth model above. Notable exceptions are that the geographical impacts are no longer significant, except for the Productivity models, whilst the project dummy variables only have an impact in the turnover and productivity models.

Once again the R-squared in these models is higher than previously found, and in fact the models are seen to explain up to 51% of the variation in growth. However it should be noted that the very small sample size for these payment models may actually be upwardly biasing the R-squared value and so their interpretation should be treated with caution.. It is also worth noting, for the offers and payments models, that the technique used (OLS) does not account for the problems associated with selection and endogeneity bias previously mentioned and so they may be over or under-stating the impact of RSA on growth.

### *4.8 Summary of Results*

The dual purpose of RSA is the creation and safeguarding of jobs; the above models have provided an insight specifically into the effectiveness of RSA assistance on growth, and although the explanatory power of the models is quite low in some cases, evidence of a relationship between assistance and employment growth was detected. Regarding the second key objective of RSA, the safeguarding of jobs, the four year model is likely to have included a large proportion of these jobs as assistance received prior to 2007 may have enabled the jobs to be still in existence in the subsequent 2007-11 period, and as such 'counted within the analysis[27], however we may be understating their importance. We only estimate models of employment growth in the period 2007-11; if employment retention was not an issue for non-assisted firms, then the models may not fully capture the importance of RSA assistance, as the relative importance of job safeguarding may be understated[28].

The key findings from the growth models are that being in receipt of RSA has a positive impact on employment and turnover growth, with the strongest impact felt over the 2007-11 period[29], which is important given the period of economic decline after 2008. No such impact was found for productivity growth, although that is not the

[27] The cost-per-job analysis in Section 5 is based on net employment growth and as such does not explicitly include the contribution from the safeguarded jobs.

[28] For a more detailed discussion of the issues surrounding safeguarded jobs refer to section 5.4 and 5.7 in the BERR paper "Evaluation of Regional Selective Assistance (RSA) and its successor, Selective Finance for Investment in England (SFIE) http://www.berr.gov.uk/files/file45548.pdf

[29] The coefficients on the RSA variables provide an indication of the magnitude of the impact on growth however it is likely that these are overstated as the models are missing key variables which one would also expect to find in assisted firms e.g. exporting, innovating, undertaking R&D. Inclusion of these additional variables is likely to reduce the size of the coefficient on the RSA variables.

focus of RSA, additionally it may be the case that firms were not focussing their efforts on productivity improvements during the recession, thus any assistance received was channelled into employment or turnover improvements.

The results found little evidence of an impact on growth over the 2010-11 period however it is likely that a longer time period is needed to see the effects of assistance filter through. There was also no evidence to support the fact that RSA improved growth amongst foreign-owned firms. It may be the case that these firms sought support for a different set of reasons than indigenous firms, indeed Modernisation/Expansion projects accounted for the largest share of projects amongst non-Scottish owned firms. If such firms were exposed to a wider international decline in demand then the projects may not have yet realised their full potential.

Importantly, there was a positive impact from offers of RSA on employment and turnover growth, however no such impact was detected from the actual amounts of RSA paid out firms. This finding may be a direct result of the operational nature of the assistance programme in that payments are given in stages and are linked to successful outcomes i.e. if the number of jobs created or safeguarded falls short of that initially agreed then subsequent payments are withheld. In this scenario the offer would act as the catalyst for change rather than the actual payment itself.

In the majority of models being Account Managed also had a positive effect. These results together then reaffirm that it is the offer of assistance in itself, rather than the payments, which is key to subsequent performance, particularly when coupled with the general support that is given by Scottish Enterprise in the overall package of assistance.

## 5 Contribution to the Economy and Cost-per-Job Analysis

Following the methodology used in the NI SFA analysis we can estimate the economy-wide effect of RSA. We do this based upon the average employment change for assisted firms, and, in conjunction with the econometric analysis, use the positive and significant coefficient on the assistance term to provide the growth increment. This approach makes an important assumption: namely, that firms do not create jobs without the real prospect of future sales, implicitly accepting that there is a restructuring effect in which the offer of assistance encourages the firm to explore new opportunities which require these new employees, but which take some time to have a sales or productivity benefit

To estimate the economy-wide benefits of RSA assistance on this basis, the increments to employment growth, from firms in the employment growth model in receipt of RSA offers prior to 2007, have been converted into absolute employment gains. These employment estimates are then grossed-up to the level of the economy as a whole, based on the number of interventions with assisted firms, and translated into value added using ratios of value added per employee derived from the Scottish Annual Business Survey. We do three separate estimates for the contribution to the economy; the first is based on those firms which are captured in our employment model (from Table 18) and reflects the contribution from these firms only; the second estimate then uses the same methodology but expands the number of firms to all those

matched to the BSD (422); the third estimate then widens this to include all firms within the Scottish Enterprise dataset (693)[30].

The range of estimates suggests that between 2007-11 RSA assistance (paid between 2004-07) resulted in an increase in employment in the Scottish economy of between 549 and 3,649 jobs over the period; this additional employment then generated value added of between £30m and £201m although it is important to note that these figures may underestimate the total impact of RSA due to the fact they exclude any positive multiplier effects which may stem from the additional demand generated by more rapidly growing employment. We proceed to estimate cost-per-job (CPJ) estimates based on these calculations and have included in the numerator a sum of £2m per annum to reflect the overheads and administration costs associated with RSA. Based on this the CPJ estimates range from £13k to £29k. Estimate 3 which is our preferred estimate, as it represents all firms in receipt of RSA over the period (with caveats), suggests that the CPJ is £26k.

[30] The latter two estimates will also include firms whose employment fell, had no growth or those who safeguarded jobs over the period. We use the same growth increment for all three estimates; the increment is drawn from the econometric modelling however we cannot be sure that the 134 firms in the model are representative of the wider 422 matched firms or the 693 in total that received RSA payments. We must therefore caveat the results from estimates 2 and 3 with the fact they may either over- or underestimate the impacts to the economy depending on how representative the firms included in the model are of the wider population of RSA recipients.

**Table 20: Economy-wide Impact of RSA based on Econometric Analysis**

| | Estimate 1 | Estimate 2 | Estimate 3 |
|---|---|---|---|
| | **All RSA Recipients in model and payments prior to 2007** | **All matched RSA Recipients in period and payments prior to 2007** | **All RSA Recipients in period and payments prior to 2007** |
| Econometric Model used | **OLS** | **OLS** | **OLS** |
| Average (median) level of employment in RSA recipients in 2007 | 21 | 27 | 27 |
| Average growth increment (2007-11) | 19.50% | 19.50% | 19.50% |
| | | | |
| Implied additional employment per firm | 4.1 | 5.3 | 5.3 |
| Number of RSA assisted firms | 134 | 422 | 693 |
| | | | |
| Total Employment Effect | 549 | 2,222 | 3,649 |
| GVA per employee (Avg pa 2007-10) | £55,165 | £55,165 | £55,165 |
| Total value added | £30,270,690 | £122,567,252 | £201,277,501 |
| | | | |
| Total Payments to RSA Clients[31] | £9,839,000 | £21,800,000 | £88,700,000 |
| Estimate of Cost of Administration (~£2m p.a.) | £6,000,000 | £6,000,000 | £6,000,000 |
| Total Cost of RSA | £15,839,000 | £27,800,000 | £94,700,000 |
| CPJ | £28,865 | £12,512 | £25,955 |

Source: ONS/Scottish Enterprise/Scottish Annual Business Survey

# 6 Comparison with Northern Ireland Selective Financial Assistance (SFA) Results

## *6.1 NI Results*

A similar analysis to the above was run on Northern Ireland firms to estimate the effects of Selective Financial Assistance (SFA)[32] on employment growth over the 2007-12 period. Two sets of models were run, one based on survey results which allowed for a more sophisticated analysis for the 2007-12 period; and the other based on government provided data, with the analysis covering the 2007-10 period.

The survey results, showed no impact on employment growth from SFA assistance (measured as a dummy variable) over the 5 year 2007-12 period. An impact was

[31] As stated on Page 4 the 422 matched firms accounted for just 40% of the total payments received by all 693 firms. When we restrict this to payments prior to 2007 this falls again and the payments received by matched firms accounts for just 25% of all payments prior to 2007.

[32] SFA is the NI equivalent of RSA that is paid out to firms under the guidance of Invest NI.

initially detected for turnover growth, however this was no longer statistically significant once selection was controlled for. Models which included the value of offers and those which included payments were also found to have no impact on growth over the period.

The one year models covering 2011-12 revealed an impact on both employment and turnover growth when using the offers of assistance made to firms. SFA offers of assistance were found to have increased employment growth by around 8 per cent and turnover growth by around 20 per cent, after controlling for selection. No impact was detected however on the amount of money paid out.

The models run using the official government data covered a series of one, two and three year growth periods. SFA assistance (measured as a dummy variable) was found to be significant for growth in the OLS models but this was no longer the case when PSM modelling was used to control for selection and endogeneity.

The actual value of SFA offers were found to positively impact on employment and turnover growth over the 2008-10 period, increasing employment growth by 11 per cent and turnover growth by 19 per cent; there were also impacts of a similar magnitude detected for the one year periods.

The models using the official data were the only ones to show an impact on growth from the value of payments made to firms. Payments were positively associated with employment and turnover growth for 2007-10 and also within the one year models.

The contribution to the NI economy from SFA was estimated at an additional 1,771 – 3,555 jobs generating value added of between £46m – 250m over the 2011-12 period. The preferred CPJ estimates related to payments actually received by SFA beneficiaries and lay in the range £22k to £34k. The lower estimates in the range based on government administrative data with the higher estimates derived from the evaluation survey.

### *6.2 SFA and RSA Comparisons*

The two separate analyses sought to measure the impact of financial assistance on growth from 2007 onwards. The datasets used were comparable in that both included the total value of all offers made between 2004/05-2011/12 and the amounts paid out over this period. However, importantly, there was a greater range of variables in the NI dataset which were obtained from the bespoke evaluation survey.

In both analyses an assistance dummy was generated which reflected whether a firm had been assisted over the period. The NI SFA analysis found no impact from this assistance variable whereas in the Scottish RSA analysis the assistance dummy was found to be positively related to employment and turnover growth in the 2007-11 period.

The NI SFA analysis did find that offers of assistance were key to growth in NI, particularly over the 2010-11 period, whereby offers made in earlier periods led to increases in employment and turnover growth. A similar finding was made for Scotland, although the effect was only felt in the longer 2007-11 period, whereby

offers of assistance made prior to 2007 increased both employment and turnover growth up to 2011. Neither the NI analysis of survey data nor the RSA data showed any impact from actual payments on subsequent growth.

The cost-per-job estimates that were derived for each analysis covered different periods of time, however there was an overlap in terms of the preferred estimates. The preferred CPJ estimates for SFA ranged from £22k-34k whilst for RSA the preferred estimate was £26k. CPJ estimates are not straightforward to capture thus the fact that the estimates from the two different studies were within the same ballpark provides a degree of reassurance.

Overall, offers of assistance, rather than the amounts paid out, were thus seen to drive growth in both NI and Scotland. For NI, this finding was interpreted as SFA acting as an important leverage tool for firms, with an offer of assistance helping to perhaps secure additional investment; provide credibility to external suppliers and clients and improve confidence within the firm. We could make similar assumptions for Scotland; here offers of assistance, as well as being Account Managed, as shown by the significance of the RSA-AM dummy variable, were key to growth. We would suggest therefore, in a similar manner to that for NI, that rather than the amounts paid out, it is the overall package of support given to firms, which includes advice and guidance, that has the effect on growth.

Whilst both sets of results thus provide some evidence of a positive relationship between support and growth, they should be treated with a degree of caution. The data upon which the RSA models is run does not have any information on other important firm-level activities, such as exporting, undertaking R&D or creating innovative products or processes. The inclusion of such variables in the SFA models sought to reduce the impact of assistance on growth, due to the fact that it was the impact of these business activities that was improving growth, and such activities are most likely to be undertaken by assisted firms. These 'missing variables' for the RSA analysis may be crucial, and so we must bear this caveat in mind when analysing the results. We must also be mindful that although jobs safeguarded are likely to be included within the analysis we have not explicitly controlled for them within the models and as such the impact from RSA on maintaining employment is unknown.

## 7 Summary and Conclusions

The objective of RSA is to help businesses undertake investment that will directly result in the creation or safeguarding of jobs in Scotland. The purpose of this analysis was to primarily assess whether RSA had an impact on employment within Scotland and, if so, to gauge the extent of this impact.

Overall, the total value of RSA offers given out by Scottish Enterprise over the 2004-12 period was £532m of which £243m was paid out. Firms in receipt of RSA were predominantly Scottish-owned whilst assistance was most commonly sought for new projects on existing sites, and modernisation/expansion within Scotland. Most firms received assistance for just one project; the median offer over the period was £120,000 whilst the median payment was £100,000.

Of the 693 firms that were in receipt of RSA over the period a total of 422 were matched into the BSD dataset, enabling their employment, turnover and productivity growth (turnover per employee) to be tracked. Over the 2007-11 period firms in receipt of RSA (and with offers accepted prior to 2007) grew by 2.7% per annum whilst non-assisted Scottish firms grew by just 0.4% per annum. Indeed examining the two and three years prior to- and post-acceptance of an offer of RSA revealed a higher rate of growth in the period thereafter. Both these measures tentatively suggested that RSA was having an impact on employment growth over and above what would have occurred in its absence. The econometric analysis was used to test this, controlling for other factors which may be associated with growth such as size, age, location of firm, and sectoral economic performance.

The econometric analysis revealed that offers of RSA assistance were key to growth, acting as a catalyst for the projects to go ahead and generating the subsequent employment growth. Offers of RSA were also important in respect of turnover growth. In both these cases it was offers prior to 2007 that were found to generate higher growth in the subsequent four year period. Models which looked at the effect of RSA on the one year 2010-11 period showed no discernible impact on growth. In addition, the payments made to firms had no impact on growth.

Translating the econometric results into the actual impact of RSA on the Scottish economy revealed that RSA was potentially responsible for creating up to 3,600 jobs between 2007-11, generating value added of £201m. The resulting cost-per-job was estimated at £26k, which was within the bounds of that estimated for NI based on the SFA analysis.

In general the results of the RSA analysis were consistent with the SFA analysis conducted in NI. Here offers of SFA assistance, rather than payments, were also found to drive growth, with the strongest impact felt over the 2011/12 period, whereby offers were found to increase employment by 7.5%. The fact that the offers were key to growth were also backed up by the qualitative findings, whereby firms stated that securing an offer of SFA was a helpful tool in demonstrating capacity and credibility to clients, suppliers and to the private finance sector. Multinational firms suggested that holding an offer of SFA showed commitment to the local economy and thus was important in generating confidence within the firm and amongst it suppliers and clients. Indirect effects of SFA were also mentioned by firms and included improved staff knowledge and skills; the introduction of new or significantly improved products or processes; and improved technical capability or understanding. Taken together the quantitative and qualitative results reveal that SFA is more than just a means of providing financial assistance to the firm, but in fact can provide credibility to the firm and act as an important leverage tool. The subsequent investment can not only improve employment outcomes, but can help add to the skill set within the business and can result in better products and ways of working.

Given the similarities between the NI and Scottish results it is likely that a similar scenario would apply in relation to the effects of RSA. In fact the importance of the AM-RSA interaction term reinforces this view and suggests that the impact of the offer in conjunction with the general support received from being account managed provides benefits to the firm, over and above a simple employment generation effect.

Overall then, the key message from this evaluation is that RSA does have an impact on the Scottish economy, both directly and indirectly. This is particularly important given the economic context of the evaluation period, and the significant downturn in the economy since 2008. In essence, without RSA the Scottish economy would be in a worse position than it is presently. The econometric results show that employment would have been lower without the investments undertaken with the help of RSA, whilst it is also possible that many businesses would not have modernised nor upgraded their skills and processes to the same extent.

## 8 Recommendations

The current analysis was conducted using available administrative data on RSA offers and payments, and linking this to a national dataset providing information on employment and turnover. Together these allowed an analysis of the effectiveness of RSA to be undertaken, albeit with some key variables missing. These key variables include information on firm-level activities such as exporting, undertaking R&D and innovative behaviour; as well as characteristics of the owner-manager; skills of the employees and more detailed information on the business, its legal status and its board of directors. Such information can all be associated with growth and having access to the data would further allow for the actual impact of assistance to be isolated from these potentially contributing factors.

If the analysis was to be repeated some of this additional data could be drawn from other data sources e.g. the Community Innovation Survey and FAME data. However this runs the risk of being available for only a proportion of the firms that received assistance and also may not be up to date. Instead, the ideal solution would be to undertake a bespoke survey which covers all key areas of the business and which asks both quantitative and qualitative questions on the impact of RSA and its wider benefits. Such a survey could be used to directly assess the additionality of RSA, as reported by the firms, as well as providing variables which can be linked to an administrative dataset such as the BSD, allowing for a more detailed econometric analysis to be undertaken which would also be independent of the bias associated with self-reported assessments. Taken together, the survey results and econometric analysis could thus be used to evaluate RSA both directly and indirectly as well as quantitatively and qualitatively to give a fuller picture of the wider impacts of RSA on Scottish firms and the economy.