



**University of Dundee**

## **Dundee Discussion Papers in Economics 159**

Dewhurst, John; Shakespeare, Sarah

*Publication date:*  
2004

[Link to publication in Discovery Research Portal](#)

*Citation for published version (APA):*

Dewhurst, J., & Shakespeare, S. (2004). *Dundee Discussion Papers in Economics 159: Regional variation in the impact of the Shell Technology Enterprise Programme*. (Dundee Discussion Papers in Economics; No. 159). University of Dundee.

### **General rights**

Copyright and moral rights for the publications made accessible in Discovery Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from Discovery Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the public portal.

### **Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



University  
of  
Dundee

---

---

# Dundee Discussion Papers in Economics

---

---

## Regional Variation in the Impact of the Shell Technology Enterprise Programme

John Dewhurst  
And  
Sarah Shakespeare

Department of  
Economic Studies,  
University of Dundee,  
Dundee.  
DD1 4HN

Working Paper  
No. 159  
January 2004  
ISSN:1473-236X

# **REGIONAL VARIATION IN THE IMPACT OF THE SHELL TECHNOLOGY ENTERPRISE PROGRAMME**

**JOHN DEWHURST & SARAH SHAKESPEARE**

**DEPARTMENT OF ECONOMIC STUDIES  
UNIVERSITY OF DUNDEE  
DUNDEE  
DD1 4HN**

## **ABSTRACT**

The paper presents a tentative analysis of the regional dimensions of the Shell Technology Enterprise Programme. Following a discussion regarding the operation of the programme it is argued that the programme is limited more by company applications than by student applications. Second, it would appear that there is some support for the contention that students are attracted more to this scheme in regions where graduates find it more problematic obtaining permanent employment quickly. Finally, there is evidence that company applications are relatively higher in areas of high unemployment and where the firm birth rate is low.

## **KEYWORDS**

Small and medium sized enterprises, Shell Technology Enterprise Programme, regional variation

## **REGIONAL VARIATION IN THE IMPACT OF THE SHELL TECHNOLOGY ENTERPRISE PROGRAMME**

### **1. INTRODUCTION**

Many, if not all, economic policies designed to operate nationally have an implicit regional effect. Policies involving transfers of resources from one set of agents to another will favour regions with a relatively large number of those to which resources are shifted and impact unfavourable on those regions which are less well endowed with that type of agent. Even if the policy does not involve a direct transfer of resources its impact may differ between regions. Some regions may have endowments, stocks, infrastructure or behaviour patterns that enable them to gain from the policy more than their relatively disadvantaged neighbours. The extent to which national policies reinforce or counteract traditional regional policy, which by its nature is designed to be regionally discriminating, is an interesting question both in theory and empirically.

This paper examines some dimensions of the regional impact of a national policy - the Shell Technology Enterprise Programme (STEP). The prime purpose of the programme is to address the perceived reluctance of Small and Medium Sized Enterprises (SMEs) to employ graduates and the perceived reluctance of graduates to seek employment in the SME sector. The programme and possible regional variations that might occur are discussed in the following section. Section 3 examines data provided by STEP in order to reveal the differential regional aspects of the scheme and to test hypothesis developed in Section 2.

### **2. THE SHELL TECHNOLOGY ENTERPRISE PROGRAMME**

STEP is a scheme whereby undergraduate students at UK universities work on specified projects for SMEs for eight weeks during the summer vacation, most usually prior to the undergraduate's final year. The programme is perceived to have benefits for both the student and the firm for which they work. Students are put in contact with the scheme through

the careers service or similar of their university, firms engage with the scheme through a designated local agency. The agencies involved vary across the country and include some universities, Business Link agencies, Enterprise councils and Chambers of Commerce amongst others. These agencies are responsible for administering the programme in their area.

As stated in the introduction, the prime purpose of the programme has been to address the perceived reluctance of SMEs to employ graduates and the perceived reluctance of graduates to seek employment in the SME sector. In particular firms are expected to gain from (a) using the energy and skills of the local student population, (b) gaining valuable assistance for projects - some of which might not otherwise be undertaken, (c) exploring the possibility of the employment of graduates, (d) establishing closer contacts with the local agency and the local university, (e) identifying the scope for introducing new skills into the firm and (f) enhancing the development and training of a future possible employee. On the other hand students may gain from (a) experience in industry, (b) an insight into the practical application of theory, (c) extension of their skills into a business environment, (d) making a positive contribution to business development, (e) improving their employment prospects, (f) earning income during the vacation and (g) improving their curriculum vita. (Kirby and Mullen, 1990)

Westhead, Storey and Martin (2001) reporting on the 1994 cohort of placements found that, although there was little evidence to support the view that STEP students were any more likely to take employment in the SME sector, there was evidence that STEP students were more likely to have obtained full-time employment three years after the placement. However they were not able to demonstrate any significant increase in graduate employment in participating SMEs in the twelve months following the participation. Westhead and Storey (1998) conclude that participating businesses were content with the operation of the programme, many recognized skill shortages in their organizations after the scheme, and they were more likely than non-participants to recognize that recruitment problems might limit growth.

These results suggest that, although the scheme may not be having a significant impact on the broad aim of encouraging more graduate employment in SMEs, both firms and students that participate in the scheme do benefit to some extent.

A question not addressed in previous studies is whether the scheme operates in a regionally differentiated manner. It should be made clear that there is no evidence in the publicity material of the STEP that it is explicitly designed in such a manner. However if the take up of the scheme were higher in relatively under-performing areas the programme might be operating in a manner that helped to erode regional differentials, whereas if it were more successful in relatively better performing areas it would clearly be accentuating regional differences.

From the point of view of the students there may be an a priori case for arguing that interest in the scheme might be higher in less prosperous regions. In an area with higher unemployment students might find it more difficult to obtain summer vacation jobs and find suitable employment after graduation. Application to the programme could be expected to increase the chances of finding vacation employment and, possibly, the chances of finding permanent employment soon after graduation. This argument would suggest that there might be a bias towards the less prosperous regions of student interest in the scheme.

The question of whether the scheme might appeal more to companies in one area rather than another is more complex. If unemployment in a region is high it may be that firms have less need to explore innovative ways to add to their employment pool. Indeed if such companies operating in poorer areas are under greater competitive pressures, due perhaps to deficient or static local demand, they may feel less able to engage in the programme as it involves both a commitment on their part of time and is, to a degree at least, risky. In addition it may be that the scheme appeals to the more entrepreneurial and innovative SMEs rather than more conservative firms. As Storey and Johnson (1987) report, the most entrepreneurial regions in the UK are also the richer regions. For these

reasons one might expect a regional bias in the interest expressed by firms in the programme and that bias to be biased towards the more prosperous regions of the country.

Alternatively it may be that companies operating in more prosperous regions do not feel under the same pressure as firms elsewhere and thus do not generate as many "problems" that students could use as projects for their placement under the scheme. In addition it might be that companies in less prosperous regions are more used to intervention by agencies concerned with regional development. Links developed between such agencies, some of which administer STEP, and the region's firms may be better established in lagging regions. If these factors are most important then the programme might be expected in a regionally discriminatory way which reinforces rather than runs counter to explicit regional policy.

### **3. REGIONAL VARIATIONS IN APPLICATIONS TO STEP**

The analysis in this section depends crucially on data on the regional breakdown of applications to the programme provided by STEP. This data covers the two years 2000 and 2001 and is shown in Table 1. Three facts are immediately apparent from the table. First, the number of student applications exceeds the number of company applications by a factor of four. Second, the scheme can cater for a relatively small number of placements in any year. Third, whereas student applications rose by 16.5% between 2000 and 2001, company applications fell by 8.5%. It should be noted that the scheme does not operate in Wales.

Although the figures in Table 1 appear to exhibit regional differences, any comparison based on the raw data would be unjust. In order to allow for the fact that the numbers of students and the numbers of SMEs in each region are not the same the figures should be standardized to rates.

In converting the student application data to rates it is necessary to control for the number of students that a region has. This can be done in two possible ways - by classifying students according their permanent

residence or by classifying them by means of their region of study. Given that the scheme is operated in an essentially regional manner it was thought slightly better to use as the population of students those studying in a region, though choosing the other classification leads to little if any qualitative change in the results. In order to standardize the data for 2000 the number of applications has been divided by the number of higher education students in the region in 1999/2000, less the number of first degree graduates in the region in 2000. The rate is expressed per thousand. There will be some distortion in these figures due to the inclusion of post-graduates and first year students, neither of which groups are likely to use the scheme. Further it is impossible to allow for the fact that the student populations of the regions maybe heterogeneous with respect to their disciplines and that this might in turn be expected to influence the application rate. The average, for 2000 and 2001, regional student application rates are shown in Figure 1. These vary considerably from 2.87 per thousand in the East of England to 5.10 in the South West.

There is some evidence that these student application rates are negatively correlated with employment prospects for graduates from the region. It is possible to measure, for both 1999 and 2000 those graduating and entering permanent employment as a proportion of all those graduating whether employed or unemployed. A correlation of the average (2000 / 2001) application rate with the average (1999 / 2000) permanent employment rate gives a value of -0.29 which, while not significant at traditional levels with the small number of observations, is consistent with the view that students may see participation in the scheme as advancing their prospects of permanent employment and are more disposed to apply to the scheme in areas where graduate permanent employment is relatively less likely. It may be noted though that the association appears stronger for applications to the scheme in 2000 than it does for applications in 2001.

The average student application rate exhibits a negative correlation with regional GDP per head in 1999 / 2000 - so application rates are higher in poorer regions (though again not significantly at traditional levels) - and rather stronger negative correlation with the growth in GVA per head 1999-



2001, indicating that application rates are higher the slower the growth rate in the region. However application rates appear unrelated to the overall unemployment rate in the region. Table 2 gives the relevant correlation coefficients.

When considering company applications again the raw figures have been converted to rates per thousand by dividing by the number of small and medium sized companies in the relevant region, again expressing the rate in applications per thousand. Again attention is directed to the average rate of application per region over the two years in question. The regional breakdown of the rates is shown in Figure 2. There appears to be rather more variability in the company application rates than in those for students. Less than 2 firms in 1000 applied to the scheme in Yorkshire and The Humber, the East of England, South East / London and Northern Ireland whereas over 7 per 1000 apply in the North East and in Scotland. In part at least the company application rate in the North East may be due to the fact that the North East was where the scheme started in 1986.

There appears to be some association between the company application rate and measures of regional economic activity. Correlation coefficients are shown in Table 3. Company application rates are higher in less prosperous and slower growing areas. They are also negatively related to the birth rates of new firms in the regions. If this is taken as a measure of dynamism, innovation or entrepreneurship in the region then this result indicates that the programme is operating in a way so as benefit the less dynamic and less prosperous regions. In part that may be a reflection of a possibly more active approach taken by agencies that run the programme in these areas. It may also be that the scheme is advertised and promoted more widely in some areas rather than others. There is some support for this as the correlation coefficient between student application rates and company application rates is 0.5198.

A final insight is given by comparing the students' applications per company application by region. This figure might be said to measure the excess demand for the scheme by students in a region. Again there is

considerable variation in these figures ranging from 10.5 students applications per company application in Yorkshire and The Humber in 2000 to 2.24 in the North East in the same year. It is interesting to note that of the 7 agencies then operating the scheme in Yorkshire and The Humber, 5 of them were based in universities - a proportion of 0.71. In no other region did that proportion exceed 0.3. It is also noticeable that in 7 out of the ten regions student applications per company application rose between 2000 and 2001. This suggests that the scheme is limited more by the willingness of firms to participate rather than by the numbers of students.

Reinforcement of this view is provided by the significant correlation between the student applications per company application and the company application rate. This is significantly negative indicating that where company application rates are high the number of placements comes closer to matching the desire for placements by students. This coefficient is given in Table 4 together with correlations of the student applications per company application with other variables considered earlier. Although not significant, as one might expect there is a negative correlation with the student application rate.

#### **4. CONCLUSION**

The analysis in this paper must be taken as indicative rather than definitive. The small number of regions available for study and the difficulties in constructing a precise denominator for the student application rate qualify the conclusions that can be drawn. With greater spatial disaggregation one might have greater faith in the results.

However, tentatively, three conclusions may be advanced, even allowing for the data problems. First, from the analysis of the number of student applications per company application, it appears that the programme is limited more by company applications than by student applications. Second, from the analysis of the student application rate it would appear that there is some support for the contention that students are attracted more to this scheme in regions where graduates find it more

problematic obtaining permanent employment quickly. If participation in the scheme is perceived to be an advantage by employers and potential graduate employees, this finding is consistent with the view that such labour market signaling may be more worthwhile when jobs are more difficult to come by. The result is also consistent with the finding of Westhead, Storey and Martin (2001) that students having had placements on STEP were more likely to find permanent employment sooner than those that did not participate. Finally, there is evidence for the analysis of company applications that these are relatively higher in areas of high unemployment and where the firm birth rate is low. One hypothesis might be that agencies are more active in such areas and that firms are more used to agency intervention in the regional economy in such locations. However this cannot be tested given the data available. There is sufficient evidence to suggest that, for whatever reason, the programme is biased, in the sense that it engages with relatively more firms, in relatively lagging regions. If there are, as is hoped though not empirically established, positive benefits that flow from the scheme then the scheme may be reinforcing regional policy rather than acting counter to it.

#### ACKNOWLEDGEMENTS

The authors are extremely grateful to the Shell Technology Enterprise Programme for making available the data on which the analysis of this paper is based. They are also grateful to the members of the ESRC Urban and Regional Seminar Group for their comments on an earlier draft of this paper.

#### REFERENCES

Kirby, D.A. and Mullen, D., 1990, "Developing enterprise graduates", *Journal of European Industrial Training*, Vol.14 No.2, pp. 27-32

- Storey, D.J. and Johnson, S., 1987, "Regional Variations in Entrepreneurship in the UK", *Scottish Journal of Political Economy*, Vol.34 No.2, pp. 161-173
- Westhead, P. and Storey, D.J., 1998, "Assessing the contribution of the Shell Technology Enterprise Programme to SMEs in the UK", *Journal of Applied Management Studies*, Vol.7 No.2, pp. 239-266
- Westhead, P., Storey, D.J. and Martin, F., 2001, "Outcomes reported by students who participated in the 1994 Shell Technology enterprise Programme", *Entrepreneurship & Regional Development*, Vol.13, pp. 163-185

**TABLE 1: A REGIONAL BREAKDOWN OF APPLICATIONS TO STEP**

REGION	STUDENT APPLICATIONS		COMPANY APPLICATIONS	
	2000	2001	2000	2001
South West	487	490	128	141
South East /London	1013	1480	202	178
Eastern	277	196	68	70
East Midlands	320	577	128	104
West Midlands	563	523	138	108
North West	706	959	224	251
Yorkshire and The Humber	483	453	46	60
North East	269	248	120	86
Scotland	779	813	254	195
Northern Ireland	130	121	18	20
<b>TOTAL</b>	<b>5029</b>	<b>5860</b>	<b>1326</b>	<b>1213</b>

Source: Shell Enterprise Technology Programme

**TABLE 2: CORRELATION COEFFICIENTS BETWEEN STUDENT APPLICATION RATES AND VARIOUS OTHER VARIABLES.**

CORRELATION WITH	COEFFICIENT
Permanent employment proportion	-0.2926
GDP per head	-0.2915
Growth of GDP per head	-0.4863
Unemployment Rate	-0.0509

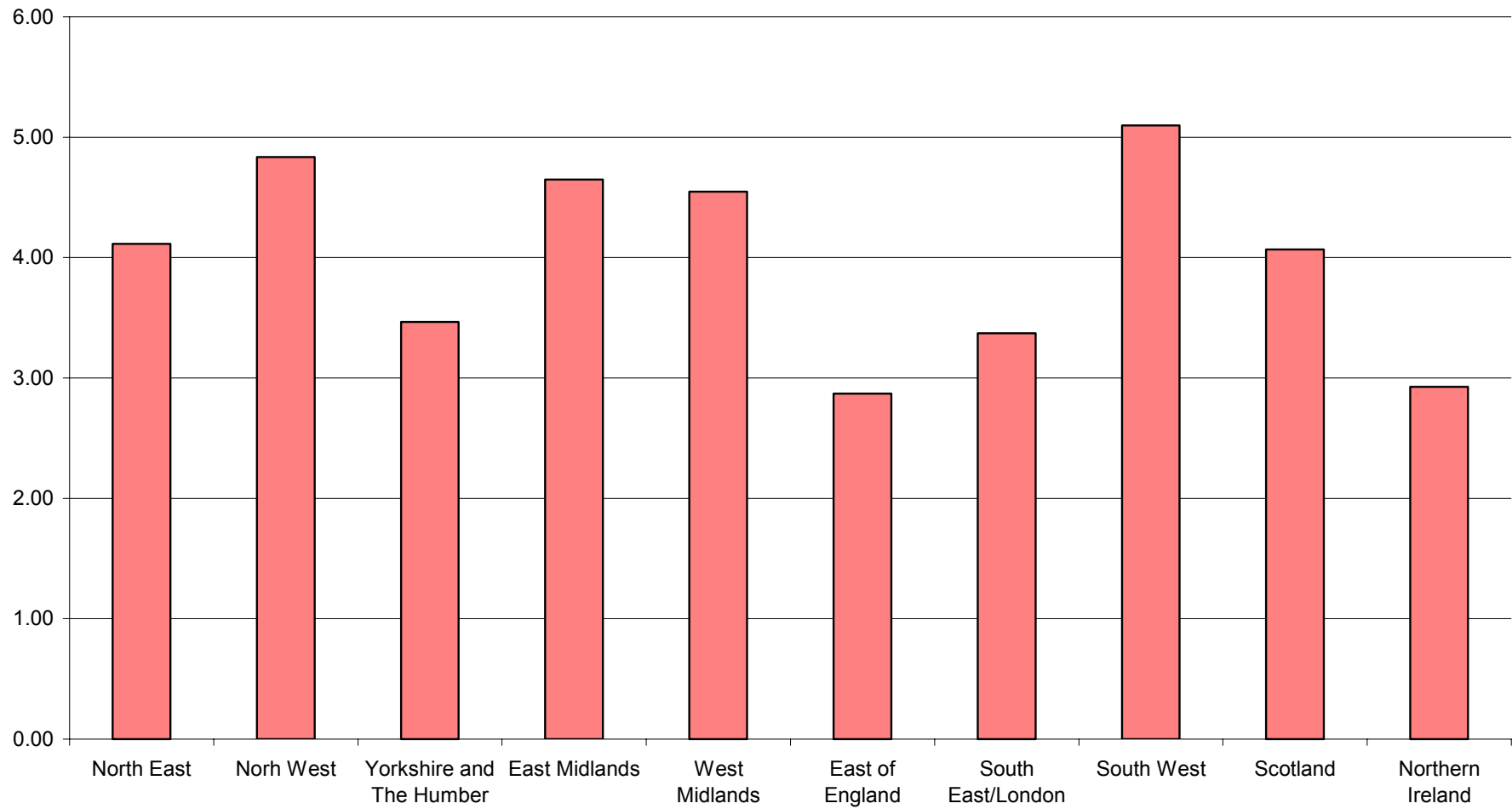
**TABLE 3: CORRELATION COEFFICIENTS BETWEEN COMPANY APPLICATION RATES AND VARIOUS OTHER VARIABLES.**

CORRELATION WITH	COEFFICIENT
GDP per head	-0.4069
Growth of GDP per head	-0.3138
Unemployment Rate	0.6099
Firm Birth Rate	-0.5765

**TABLE 4: CORRELATION COEFFICIENTS BETWEEN STUDENT APPLICATIONS PER COMPANY APPLICATION AND VARIOUS OTHER VARIABLES.**

CORRELATION WITH	COEFFICIENT
Company Application Rate	-0.6887*
Student Application Rate	-0.4994
Graduate Permanent Employment Proportion	0.5013
GDP per head	0.1159
Growth of GDP per head	-0.0337
Unemployment Rate	-0.0634
Firm Birth Rate	0.1377

**Figure 1: Student Application Rate per thousand (Average)**



**Figure 2: Company Application Rate per thousand (Average)**

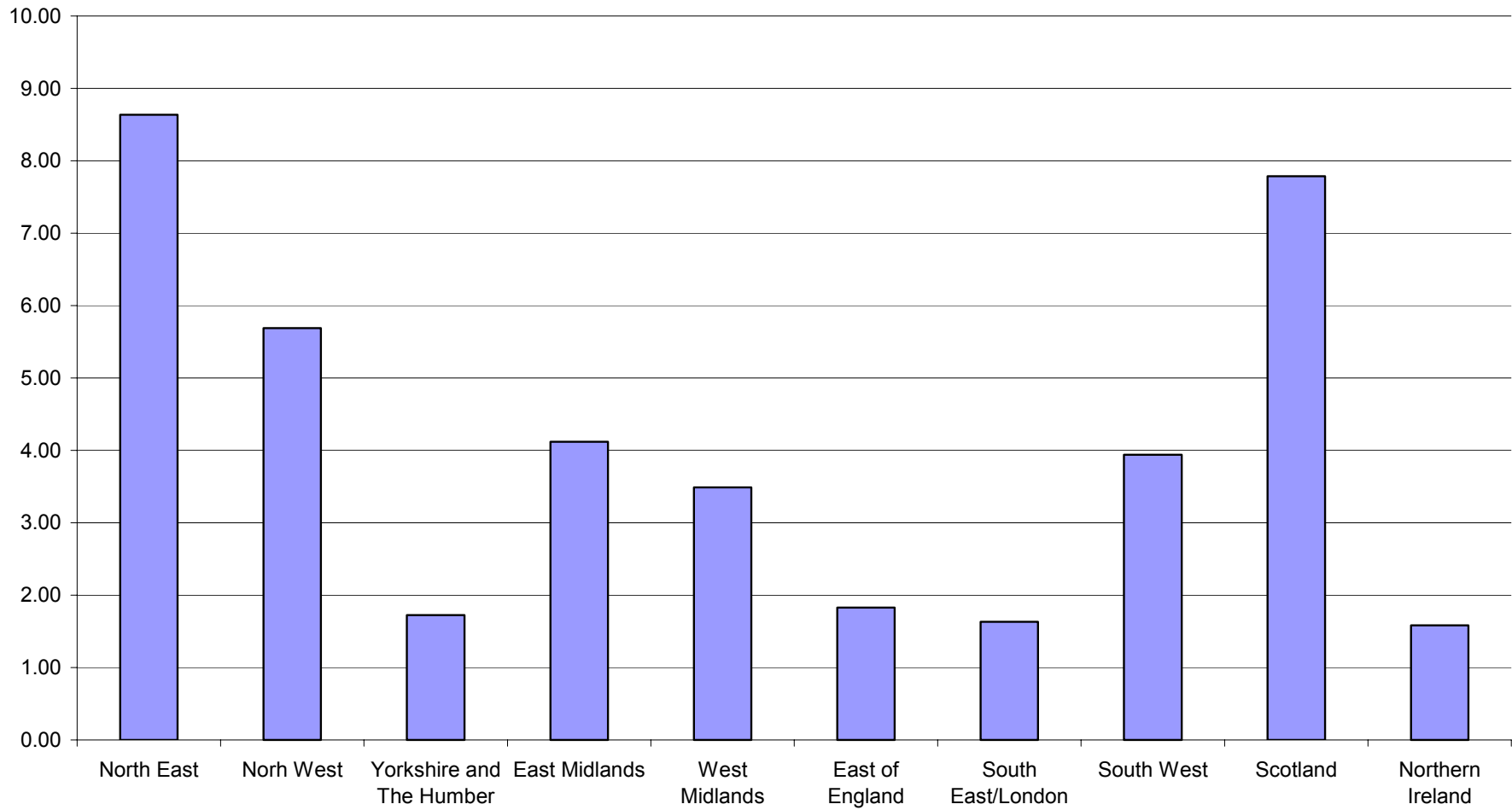




Figure 3: Student Applications per Company Applications

