ECONOMIC
Perspective

THE INDUSTRIAL DEMAND FOR SKILLED LABOUR: A COMPARISON OF SCOTLAND AND THE REST OF THE UNITED KINGDOM

by Iain McNicoll and Richard Marsh, Department of Economics, University of Strathclyde

INTRODUCTION

In recent years, there has been growing interest by national and regional policy-makers in the domestic availability and use of "skilled" labour. At least in part, this has been fuelled by a perception that, in an increasingly integrated global economic environment, one of the few remaining sources of local competitive advantage is differential access to human capital in the form of embodied labour skills.

It is not the purpose of the present paper to consider the merits or otherwise of this general argument. Rather, the point emphasised here is that, in both Scotland and the UK generally, the focus to date has been primarily on the *supply-side* of the labour market, concentrating on the measurement and assessment of the skill "outputs" of schools, training courses and tertiary education institutions. By comparison, relatively little attention has been given to the *demand-side*, in terms of analysing the domestic requirements of skilled labour needed for the local production of goods and services.

To partially address this shortcoming, a project has been underway since 1998 to provide information on base-line characteristics of the demand for skilled labour in Scotland and to provide a framework for subsequent analysis (1). A principal output of this project has been the compilation of a Scottish Labour Market Intelligence (SLMI) model, which, inter alia, can compare the embodied skilled labour requirements of Scottish industries with those in other countries or regions for which equivalent data is available. This paper presents the results of such a comparison between Scotland and the rest of the United Kingdom (RUK).

DATA AND METHODS

A detailed discussion of the strengths and weaknesses of both the technical specifications of the SLMI model and the data used in its implementation is given in the project report (2). Here it is sufficient to note that the model is in the form of an extended input-output system, combining a conventional inter-industry core (which determines total sectoral outputs) and a labour market satellite which determines total employment within industries subdivided by occupations, qualifications and social classes (3). In the version of the model used in the present paper, base inter-industry coefficients and industry employment are derived from the 1995 Scottish Input-Output tables, while the base occupation, qualification and social class matrices are derived from pooled 1995-1997 Labour Force Survey (LFS) data. The model contains 128 separately identified industries, 371 occupational categories, 30 levels of qualification, 127 subjects of HE qualification and 7 social classes.

The model as summarised above was used to compare the "skill" requirements of the Scottish economy with those in the rest of the UK via a purpose-designed "what if" simulation analysis. Specifically, the following question was addressed:

"Other things equal, what would be the effects on modelled Scottish labour market outcomes if the actual base Scottish occupational employment/industry structure was replaced by the equivalent occupational structure for the rest of the UK?"

Technically, this simulation involves replacing the base Scottish occupation/industry shares matrix with the RUK equivalent, while keeping all other matrices and data unchanged at base year Scottish values. Given the formulation of this particular scenario and the fundamental nature of the SLMI model itself, two *general* points regarding the nature of the outcomes can be stated at the outset:

(a) All levels of industrial outputs and aggregate employment in each industry

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(a) All levels of industrial outputs and aggregate employment in each industry

will be **unchanged** from actual base Scottish values.

(b) The outcome values for all other Scottish labour market variables (i.e. relating to occupations, qualification levels and subjects, and social class) *may* change from base year levels, but will not necessarily do so. Bearing the above points in mind, the *specific* results of the simulation are summarised immediately below.

RESULTS

Occupations

Table 1 shows that imposing the RUK occupational structure on Scotland leads to relatively large changes in outcome employment levels in each broad occupational division, both in absolute and percentage terms.

In terms of policy-relevance, the most important result is that Scotland *actually* had significantly fewer workers in SOCs 1-3 (i.e. managerial and professional occupations) than it would have had if the occupational structure in each industry had been the same as the RUK equivalent. Conversely, Scotland actually had more workers in all other SOCs, notably 6, 7 and 9.

It can be noted that these outcomes are not attributable to Scottish/RUK differences in the sectoral composition of aggregate output or employment, both of which remain unchanged at base year Scottish values. Rather, the differences between actual and simulated Scottish occupational structures *must* have been attributable to one or other of the following:

(i) Scotland was using *different production processes* from the rest of the UK to produce a *specific* industry-commodity.

(ii) Scotland was involved in *different stages* in the production of specific industry-commodities.

(iii) Within a given industry, Scotland was producing a *different sub-set of commodities* from the rest of the UK.

In fact, averaged across all individual sectors, it is probable that all of these factors were operational to a greater or lesser extent, though it is beyond the scope of the present study to quantify the relative importance of each.

Social Class

In UK labour market statistics, the social class of an individual is **defined** by his/her occupation; hence, it is inevitable that any changes from the base occupational employment profile will result in changes in the outcome social class results, and this is clearly revealed in table 2.

As the table shows, in comparison with the simulation, Scotland actually had some 60 thousand fewer workers in social classes 1 and 2. Scotland also had 28 thousand more workers in social classes 5 and 6. More generally, compared with the rest of the UK, Scottish industry did not demand the equivalent levels of occupational employment that would have translated more individuals into higher social classes. Thus, of immediate policy-relevance, this analysis reveals that characteristics of labour requirements in Scotland *directly* impact on social inclusion/exclusion issues.

Qualification Levels and Subjects

In the SLMI model, demands for qualified labour are derived via a qualification/occupation shares matrix. Actual and simulated Scottish qualified labour "requirements" are summarised at NVQ level in table 3(4). Actual numbers of highly qualified (NVQs 3-5) Scottish workers were lower than would have been "required" given the RUK occupational shares pattern. Conversely, actual numbers of low and unqualified Scottish workers were higher. Overall, the actual employment-weighted average Scottish NVQ level was 2.47, compared with a simulated weighted-average of 2.51.

Finally, Table 4 compares actual and simulated Scottish HE qualified labour "requirements" by subject. Reflecting the qualification level results of table 3 (specifically, the NVQ level 4 and 5 results), actual Scottish demand for HE graduates was over 22 thousand less than simulated, representing 5.2% of the base graduate workforce in Scotland.

Demand for workers in a number of specific subject specialisms were particularly unfavourably affected by the actual pattern of occupational employment in Scotland. In

particular, demands for Arts, Humanities, Languages and Linguistics were lower using the Scottish occupational structure. Perhaps more surprisingly, Business & Financial Studies and Engineering & Technology graduate demands were also lower.

Table 4 also shows that actual Scottish demand for graduates in some subjects was higher than simulated: specifically, Medicine, Medical Related, Architecture and Biological Sciences. Inspection of the detailed 3-digit SOC results underlying Table 1 reveals that the actual Scottish occupational structure was more favourable than that of RUK in certain occupations in which graduates with these specialisms tended to be concentrated.

CONCLUSIONS

Taken together, the simulation results discussed and summarised in the previous section provide clear and consistent evidence on one fundamental characteristic of the Scottish labour market; specifically, the occupational structure of employment in Scottish industries was such that, over the entire economy, *the average level of embodied skilled-labour input in production was lower in Scotland than in the rest of the UK as a whole.*

This conclusion is not attributable to Scotland being relatively specialised in "low skill" industries; indeed, effects caused by differences in Scottish and RUK industrial specialisation are specifically excluded from the analysis. Rather, the results are a reflection of the nature of the "labour technology" which was being utilised by Scottish industries compared to their counterparts elsewhere in the UK.

In turn, it could be argued that these specifically labour market outcomes are a refection of the more general past evolution of Scotland as a branch-plant and assembly economy, coupled with "job creation" initiatives which focussed on quantity rather than quality. The expected results of such long-term trends would be relatively low demands for high level managerial and professional personnel and relatively low demand for highly qualified staff in, for example, Research and Development.

To the extent that this evaluation is accurate (and though supported by the evidence in this paper, it must remain speculative), it is encouraging to observe that Scottish agencies involved in the labour market are now paying far more attention to the quality as well as the quantity of jobs created through their economic development policies.

FOOTNOTES

(1) This is the *Scottish Labour Market Intelligence Project*, undertaken jointly by Strathclyde University and the Economics Advice and Statistics Division of SEELLD. Original project sponsors were SHEFC and Scottish Enterprise. None of these organisations are responsible for the contents of the present paper.

(2) McNicoll I, Melling M, and Marsh R *The Scottish Labour Market Intelligence Project,* Strathclyde University, 1999. ISBN 0906104955.

(3) These are the three variables that are used to measure "skills" in the SLMI model, being quantifiable from available labour market statistics. It is realised that they are proxies for fundamental "generic" or "transferable" skill measures. However, apart from pragmatic grounds for their inclusion, these labour market characteristics are of policy-relevance in their own right.

(4) The LFS measures the highest level of qualification of an individual, and it is possible that, at the time of survey, some persons were in occupations in which they did not actually "require" their highest qualification.

(5) The sum of FTE jobs in each NVQ level by the NVQ level number itself and dividing by the total number of FTE jobs. Hence the figure may be viewed as the average NVQ level held.

Table 1 Scotland/RUK Simulation Results: Occupations.

SOC	Occupations	Scottish Base	Rest of UK Equivalent	Difference from Base	% Difference from Base Occupation
1	Managers and Administrators	273,593	320,956	47,364	17.3%
2	Professional Occupations	120,086	126,187	6,100	5.1%
3	Associate Professional and Technical Occupations	154,273	165,286	11,013	7.1%
4	Clerical and Secretarial Occupations	326,525	321,086	-5,439	-1.7%
5	Craft and Related Occupations	220,788	216,735	-4,052	-1.8%
6	Personal and Protective Service Occupations	210,661	193,845	-16,816	-8.0%
7	Sales Occupations	141,125	127,789	-13,336	-9.4%
8	Plant and Machine Operatives	174,954	167,077	-7,877	-4.5%
9	Other Occupations	164,825	147,868	-16,956	-10.3%
	TOTAL	**1,786,830**	**1,786,830**	**0**	

Table 2 Scotland/RUK Simulation Results: Social Class.

Code	Social Class	Scottish Base	Rest of UK Equivalent	Difference from Base	% Difference from Base Social Class
1	Professional Occupations	99,582	106,507	6,925	7.0%
2	Intermediate Occupations	456,603	510,177	53,574	11.7%
3	Skilled Occupations (Non-Manual)	491,610	471,888	-19,722	-4.0%
4	Skilled Occupations (Manual)	357,635	344,239	-13,396	-3.7%
5	Semi-Skilled Occupations	257,458	238,717	-18,741	-7.3%
6	Partly Skilled Occupations	99,427	90,222	-9,205	-9.3%
7	Armed Forces	24,517	25,081	563	2.3%
	TOTAL	**1,786,830**	**1,786,830**	**0**	

Table 3 Scotland/RUK Simulation Results: Qualification Levels

Code	Qualification Levels	Scottish Base	UK Equivalent	Difference from Base	% Difference from Base Qualification
1	NVQ Level 5	46,259	47,522	1,262	2.7%
2	NVQ Level 4	385,810	406,825	21,015	5.4%
3	NVQ Level 3	500,500	501,732	1,232	0.2%
4	NVQ Level 2	506,085	493,607	-12,478	-2.5%
5	NVQ Level 1	129,437	126,985	-2,452	-1.9%
6	No Level	218,739	210,160	-8,580	-3.9%
	TOTAL	**1,786,830**	**1,786,830**	**0**	

Table 4 Scotland/RUK Simulation Results: Higher Education Subjects

Code	Qualifications HE Subjects	Scottish Base	UK Equivalent	Difference from Base	% Difference from Base HE Subject
1	Business and Financial Studies	65,531	71,404	5,872	9.0%
2	Engineering and Technology	54,968	61,093	6,125	11.1%
3	Medical Related Subjects	54,634	52,785	-1,849	-3.4%
4	Social Sciences	48,398	51,695	3,297	6.8%
5	Medicine	26,645	25,024	-1,621	-6.1%
6	Physical/Environmental Sciences	24,417	26,012	1,595	6.5%
7	Architecture and Related	22,446	19,889	-2,557	-11.4%
8	Other/General	22,525	24,725	2,201	9.8%
9	Biological Sciences	19,828	19,334	-494	-2.5%
10	Humanities	16,472	18,834	2,362	14.3%
11	Mathematics	14,738	15,777	1,039	7.1%
12	Languages	12,791	13,792	1,001	7.8%
13	Arts	11,725	14,256	2,531	21.6%
14	Education	11,049	11,877	829	7.5%
15	Computing	10,389	11,266	877	8.4%
16	Linguistics, English, Celtic and Ancient Languages	7,843	8,332	490	6.2%
17	Agricultural Sciences	6,069	6,556	487	8.0%
	TOTAL	**430,467**	**452,652**	**22,185**	