

University Education and Residential Trends in Iceland

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ABSTRACT *This study focuses on the effect of university education on developments relating to people's choice of residence in Iceland. In order to gain answers to the research questions, secondary data were obtained from official sources, trade unions, the data bank of the Social Science Institute, University of Iceland, and by interviewing 20 nursing and business administration graduates in Akureyri and Reykjavík. The conclusions indicate that a university education strongly affects various aspects of regional development. Graduates from the University of Iceland are a great deal likelier to settle in the area of the capital than graduates from the University of Akureyri, and vice versa. University education also has a notable influence on earnings, depending on the constituency in question, and a survey demonstrated that the origin of the persons interviewed and the residence of their parents were highly significant factors concerning the university they selected for study and their choice of residence after graduation. Furthermore, project work undertaken by the interviewees and their professional training during their course of study also had a considerable influence on their choice of employment after they had completed their studies. This is explorative research based on a restricted sample. The project provides important information, but the reader is warned against excessive generalisation based on the conclusions.*

Key words: *university education; Iceland; regional mobility*

INTRODUCTION

The aim of the research reported here was to study the effect of a university education on trends in population distribution and regional development in Iceland during the period 1987–1999. Due to limited time and resources, it was decided to restrict the project to the University of Iceland and the University of Akureyri, analysing only those branches of study that are common to both universities, i.e. nursing and business management. The chief research questions were as follows. Is there a significant difference between the residential patterns of students from the University of Iceland and the University of Akureyri, after the completion of their studies? Does earning potential on the one hand and professional opportunities on the other primarily determine the choice of residence after university graduation?

The project takes support from theories relating to the social sciences and economics that deal with the connection between education and trends in regional development. Firstly, theories that consider the practical value of education, i.e. human capital theory and considerations relating to the importance of education in information society; secondly, theories of brain drain; finally, research into brain gain, which is the establishment of universities and research institutes outside a metropolis or the capital. Five hypotheses that derive from these theories are presented within the main body of the text.

The article first deals with the above-mentioned theories and, subsequently, the methodology of the research is presented. Then the conclusions are set forth, first covering university education in Iceland on a regional basis, then moving on to the effect of university education on choice of residential area. The connection between university education and earnings according to constituency is the subject of the next part and, finally, the conclusions of the interview-based part of the research are introduced.

THEORETICAL CONSIDERATIONS

The Practical Use of Education

What is the use of education for an individual or a community? Does the increased technological nature of industry add to the value of education? Is there a greater need for university educated people in an information society than in an industrial society? It will be attempted to answer these questions below.

Considerations regarding the usefulness of education are by no means new. The Greek philosophers were concerned with such matters and a complete turnabout occurred in the sphere of education in the 18th and 19th centuries, when a steadily growing European middle class embarked on the path of education. A new type of authority in the wake of the industrial revolution brought an emphasis on the use of education as a tool in the preparation for life and work. In the 20th century schooling became general practice in an increasing number of countries and education became the responsibility of the state. After the Second World War technological innovations and progress in industry began to depend, to a very great extent, on education and research, which put an even greater emphasis on the importance of being educated. Towards the latter half of the century a large proportion of the populations of Western countries had completed their education at secondary level, a significant number proceeding to a university degree (Encyclopaedia Britannica Online).

It should not come as a surprise, therefore, that scholars have long taken an interest in the study of education. A new perspective entered into the discussion of the usefulness of education when Theodore V. Schulz, president of the American Economic Association, began to proclaim his human capital theory (Schulz, 1961). In reality, the theory is an economic model exemplifying the correlation between education and prosperity. It propounds the view that the knowledge and skill of the individual is the combination of a resource, manufacturing and the proceeds of an

investment. The theory maintains that the main cause of economic growth and the superiority of developed countries is investment in human capital. Schultz states that:

Laborers have become capitalists not from a diffusion of the ownership of corporate stocks, as folklore would have it, but from the acquisition of knowledge and skill that have economic value. This knowledge and skill are in great part the product of investment and, combined with other human investment, predominantly account for the productivity superiority of the technically advanced countries... . (1961, p. 3)

According to human capital theory, a well-educated individual finds it easier to make use of inventions, learn novel working techniques and new methods of organisation than a less educated person does. He finds it easier to become adept at new procedures and manufacturing methods. As a result, he has a higher lifetime income than an uneducated individual, which balances against the cost of acquiring the education. Thus, the theory assumes that education facilitates and hastens the adoption of new methods of manufacturing, resulting in improved productivity and, as a consequence, increased economic growth. Research in the spirit of human capital theory has also shown that improved education reduces smoking, increases voter turn-out in elections and encourages the reading of a better kind of literature, to suggest only a few examples (Becker, 1992).

Theodore V. Schultz, Gary S. Becker and other proponents of human capital theory base their arguments on education in a wide sense, i.e. work training, primary, secondary and university education, adult education, etc. All the fundamental arguments, however, remain the same when the focus is on university education.

Human capital theory appeared as a management tool to increase economic growth and raise the general standard of living in the third world, thus bringing it closer to the situation in the industrial countries. This was in part achieved by organising the labour force with a view to the future requirements of industry, ensure full employment and economic growth and bring investment in education into line with other elements in the overall plan for economic growth. It also deserves mention that human capital theory was based on the concept that the ever-increasing use of technical and scientific knowledge in industry would automatically create the need to employ an educated workforce [1].

Human capital theory has been the target of various criticisms. It has been pointed out, for example, that supporters of the theory have not been able to show precisely which aspects of education are of practical value; instead they have supported their arguments with correlation statistics. Another criticism is that factors other than education explain the good qualities of educated people, that they, for example, come from the upper echelons of society, they tend to come from large towns and cities rather than the provinces and that examinations and education act as a sieve for employers to use in selecting desirable qualities, such as discipline, punctuality, interest, etc. Finally, it should be mentioned that human capital theory could explain, in part, the increased attraction of education in terms of higher

income expectations. On the other hand, the theory has not been able to explain other aspects of education, such as the will to learn, wanting increased professional respect (promotion), obtaining a more interesting job or that continuous education is required within a professional group, which applies, for example, to doctors, university teachers, specialists and other professions (Edvardsson, 1982; Woodhall, 1987).

Is there a greater need for educated people in a modern information society than in earlier societies? According to Daniel Bell (1973) and other spokesmen for the post-industrial and information society the answer is yes. The changeover to an information society appears in various forms. Information technology based on computer technology replaces mechanical technology. The mainspring of wealth creation in such a society is information and knowledge instead of capital and labour as before. The importance of industries like computers, electronics and optics in modern industrial societies is indicative of this development. In such a society theoretical knowledge is the foundation of social organisation, which leads to a rapid increase in the number of educated and technical personnel, which, in Bell's opinion, will constitute the most numerous social classes of the future. He also believes that a higher national income, as is to be expected, will create increased demand for education, health care and leisure-related services. As a result, service-related industries, such as communications, business, health, education, administration and research, will occupy an ever-increasing part of the economy. Finally, more service-related job opportunities will attract a larger number of women into paid employment, helping them towards improved financial independence.

Bell's theories, however, have had their critics. In general, one could say that Bell has foreseen industrial development in the information society as less diverse than it has in fact turned out to be. The fact that the prices of manufactured goods have fallen steadily in the past decades, whereas services have become dearer due to pay rises and inadequate productivity has occasioned a tendency for services to move increasingly into automation conducted with the aid of inexpensive technology or to slip into the black market. In the second place, in countries with a significantly unequal pay structure, a certain proportion of service jobs may descend into the category of low paying, menial work which the better-off can buy for little money, such as cleaning, domestic help or car washing. The pressure of market-oriented solutions, together with debt-ridden governments and local administrations, may bulldoze certain tasks into the home or within the domain of sports clubs and other voluntary associations (Edvardsson, 1997).

With reference to the above theories, it is possible to formulate the following hypotheses.

Hypothesis I. In areas where few individuals have received a university education employment earnings are lower than where the level of education is higher. In such areas there are also fewer technological developments and innovation is more restricted.

Hypothesis II. Theoretical knowledge (university education) is becoming increasingly important for the development of industry. This is seen in two ways. On the

one hand, education contributes to discoveries and value creation in industry and, on the other, it supports the engendering of new job opportunities.

Brain Drain

The subject of brain drain was in the limelight during the 1950s and 1960s, especially relating to individuals in the developing world who moved to industrial areas after they had gained practical education in their home countries. The outcome can be a shortage in the developing country of people with a satisfactory education to tackle various specialised jobs, such as technologists, computer experts, engineers and specialists in pedagogy and teaching. During the past few decades attention has also focused upon the emigration of scientists and experts from Eastern Europe to the West, as well as emigration of, for instance, British scientists to the USA and Asia (Angell and Kouzminov, 1991).

There is no single definition available for the term brain drain. The concept, however, is frequently used to refer to the movement of educated individuals from their homeland where they have received their education to another country (Grubel, 1987; Sánchez-Arnau and Calvo, 1987; Angell, 1991; Mostetman, 1991). This phenomenon could also be called the economics of the globalisation of human capital. A more thorough definition by Ian O. Angell (1991) not only covers the migration of educated individuals between countries, but also intellectual work, patents and other intellectual property, information and expert knowledge. It should be mentioned that brain drain has both positive and negative aspects. The negative aspects have been the main focus, i.e. that nations which lose highly educated people have to suffer an inferior standard of living and reduced income because of lost scientific and technological knowledge. The positive aspects, however, are found in the fact that the migration of educated people and scientific experts between countries has contributed to worldwide progress in scientific and technological development (Mostetman, 1991).

The decision of individuals to move between countries is a complicated process for which several explanations have been put forward. The main reasons why scientists and experts decide to move from one country to another are listed below (Grubel, 1987; Sánchez-Arnau and Calvo, 1987; Angell, 1991; Mostetman, 1991).

- Better income opportunities in other countries.
- A more favourable tax system in other countries.
- Better study opportunities in other countries.
- Better chances of career advancement abroad.
- Better support for scientific work from private businesses and the public sector abroad.
- Better research facilities and technical support abroad.
- Following in the footsteps of a mentor or colleagues.
- A better living standard abroad.
- More respect and authority enjoyed by scientists abroad.

- Democratic traditions and political system encourage emigration (applies particularly to Eastern Europe).
- Lack of respect for the cultural traditions or language of scientists in the country they are leaving.

Well-educated individuals assess the conditions in their home countries and abroad on the basis of the above factors and accordingly decide on their future country of residence. Various circumstances have also been mentioned which create obstacles to migration between countries (Angell, 1991).

- Little interest in becoming an immigrant in another country.
- Upheaval of family life.
- Nationalism.
- Known education system preferred to an unknown situation.
- Risk of losing contact with a network of experts as a result of moving.
- A preference for the situation they know, even if inadequate, to unfamiliar circumstances.

All the factors listed above, apart perhaps from cultural recognition and political persecution, apply to Icelandic scientists. They are continually comparing conditions in Iceland and abroad and many of them leave, while many return to Iceland after studies abroad. It can be argued that to a great extent similar arguments apply to movement within the country as to emigration. Of the items mentioned before, the following are of importance relating to brain drain in Icelandic provincial areas.

- Better study opportunities in Reykjavík.
- Higher earning potential in Reykjavík.
- Improved promotion possibilities in the capital.
- More support for scientific work from private businesses and the public sector in the capital.
- Better research facilities and technical support in the capital.
- Following in the footsteps of a mentor or colleagues.
- More appealing living conditions in Reykjavík.

Another theory proposes that the emigration of educated people is caused by an imbalance found in many countries between their abilities, on the one hand, to provide individuals with specialist education and, on the other, to make appropriate use of their qualifications. This theory, called 'structural tensions', describes this problem as not being confined to developing countries; it may also appear in the industrial world. It has been pointed out that where there is a balanced situation in the developing countries, i.e. there is neither the ability to educate individuals nor to make use of their qualifications, there is very little emigration of specialists. The problem, however, can grow to grave proportions in the West, where the educational capability exists but not the opportunities for the individual to practise his specialist knowledge in his home district (Sánchez-Arnau and Calvo, 1987). This applies to individuals who were born and brought up in the Icelandic provinces. After they have completed their university studies few opportunities present themselves in their

home district and most settle down in the capital or abroad. This has often been called 'educating oneself away from one's origin'.

With a view to the above theories the following additional hypotheses may be put forward.

Hypothesis III. Individuals with a university education move from the provinces to capitals or major cities because of improved earning potential, increased promotion opportunities, better research facilities and technical support and more appealing living conditions.

Hypothesis IV. Emigration is caused by an imbalance inside countries in the process of educating individuals and utilising their capabilities. Specialists either do not move to sparsely populated areas or move away from them because of limited possibilities of making use of their expertise in areas where the educational infrastructure is weaker.

Brain Gain

Brain gain is a two-fold process. On the one hand, there are educational and research institutes outside capitals and metropolises which educate individuals and engage in research and innovation for the benefit of companies and institutions. Educational institutions tend to improve the knowledge base and infrastructure of the district in question in the long term. On the other hand, measures are taken with the aim of attracting people with vital skills and knowledge, e.g. doctors, technologists and computer experts, to knowledge-deprived areas. In this way, it is attempted with pay offers and other benefits to bring in knowledge from abroad or from population centres within the country itself. In most cases these are short-term measures (Cohen, 1997).

Brain gain is a new field of research and so far few theories have seen the light of day in this area, although there have been some preliminary studies. The research that has been carried out in universities in the northern provinces of Canada, as well as in Finland, Scotland and Iceland, has revealed that universities and research institutes exercise a pervasive influence which is highly significant for the economy and culture of those areas. Among the chief conclusions are the following (Highland and Islands Enterprise, 1996; Nord and Weller, 1997; Riepula, 1998; Eðvardsson and Gunnarsson, 2000).

The first point relates to general knowledge enhancement in the area under investigation.

- Young people are increasingly drawn towards a university education. The proportion of university students increases locally, although it is still lower than in the main population centres in the country in question. Thus, Geoffrey R. Weller (1998, p. 14) says the following about universities in Northern Canada: 'Although precise statistics are hard to come by, most of the new universities located in the northern regions claim marked success in

enhancing access to university education within their regions. ... The clearest case is the most recent, namely that of UNBC (University of British Columbia) where directly upon opening it attracted half its students from outside northern British Columbia and within two years it had doubled the participation rate of northerners from a very low figure (8%) to the provincial average (16%)’.

- Universities add to the human capital of their respective areas by a process of education and training. When, for example, the University of Oulu in the North of Finland was founded in 1958 there was on average one doctor for every 1450 people in Finland. In northern Finland the ratio was one doctor per 3000–4000 inhabitants. In 1995 the average density of doctors in the country was 324 inhabitants per doctor; in the province of Oulu the corresponding figure was 310 and in Lapland 520 per doctor (Riepula, 1998).
- Knowledge from abroad finds easier access into the area in question by means of conferences, student exchange programmes, etc.
- Districts in the vicinity of northern universities come to be the subject of research projects and surveys leading to the publication of articles about them in international journals. Thus, they become part of the known world, real locations on the map.

Another important aspect where universities make their influence felt relates to research and development, but such activities, as mentioned before, are among the basic tenets of university life. Research institutes are founded in direct connection with universities. In turn, these establishments channel important technical innovations and discoveries into industry.

Universities exercise economic influence in significant and diverse ways.

- They provide work for people with a university education.
- They have a wide ranging multiplication effect in the economic sphere, so that it is estimated that each krona (currency unit) that a university is provided with has a multiplication coefficient of 1.5.
- Universities contribute to the diversification of industry, as they educate people for a variety of careers and spin-off firms are established in relation to universities (the creation of software, biotechnology, etc.). In the entrepreneurial zone around the Linköping University of Mjärdevi 150 companies have been established according to Anders Flodström, rector of the university. It is estimated that approximately 4000 jobs have been created (Brolin, 1998).
- Universities tend to reduce the outward flow of young people who would otherwise leave their home district to study at a university elsewhere. Besides, individuals from outside the area come to study and work at the local university. How long they remain varies considerably, but research from Swedish universities indicates that the teaching staffs at northern universities remain in their positions as long as their colleagues in the southern part of the country (Dahllöf, 1997).

- Universities tend to strengthen the infrastructure of neighbouring districts by ensuring good communications by road and air, sophisticated computer and information systems, equipment for conducting teleconferences increasingly used in teaching and development work, etc.

Although Canadian research indicates that the above-mentioned effect of universities is slow to manifest itself and takes a long time, even decades, unless they feature as part of a deliberate policy of provincial support (Nord and Weller, 1997), the following prediction may be reasonable.

Hypothesis VI. The result of establishing universities in sparsely populated provinces is that more people attend university, local human capital is increased and the flow of external knowledge into the area is facilitated. The research institutes linked to the university also provide businesses with important technological innovations.

RESEARCH METHODS

The main purpose of explorative research is to obtain ideas and insights relating to subjects that have been insufficiently studied, explain concepts and define the connections between variables so that hypotheses may be formulated. The methods of explorative research are commonly flexible and in many cases qualitative sources are used (Churchill, 1995). In the research project described here data has been used from The Institute of Regional Development, The Icelandic Bureau of Statistics (1997), The Ministry of Education and Culture (2000), The Social Science Institute of the University of Iceland (1997, 1999), The Icelandic Association of Nurses (1999), The Association of Icelandic Economists and The University of Akureyri. Earlier research was made use of as well, in order to further illustrate the subject. Further, nurses, business administration graduates and economists were interviewed in Akureyri and Reykjavík.

During the period June–September 1999 structured interviews were undertaken with 20 individuals. The interviewees were selected with the aim of the research in mind. Participants were selected by the method of non-probability convenience sampling. Here shortage of time and cost are important factors, where the researcher selects the sample to be studied on the basis of convenient access. The disadvantage of this method is that it is not possible to generalise on the subject to the population (Thorlindsson and Karlsson, 1996).

Contact was made with nurses, economists and business administration graduates in Akureyri and Reykjavík who studied at the University of Akureyri or the University of Iceland after 1987 and they were asked to assist in the choosing of participants. The interviews took place at the participants' workplaces in Akureyri and in Reykjavík as well as at the University Research Institute in Akureyri. Permission was obtained from superiors at each workplace where this was relevant. The interviews took approximately 15–20 minutes. They were taped and a typewritten record was made. The data analysis was carried out with the aid of the statistical program Excel. Such qualitative analysis gives the researcher an opportunity to

TABLE I. Areas of university location, types of studies offered and number of students in Iceland, autumn 1999

University location and studies offered	No. of students	Proportion of total
Area of the capital	9167	91.8
University of Iceland	6588	66.0
University College of Education	1262	12.6
The Technical College	607	6.0
The University of Reykjavík	490	4.9
The University of Arts	220	2.2
Western Iceland	228	2.3
Hvanneyri Agricultural College	72	0.7
The Cooperative College of Iceland	156	1.5
Northeast Iceland	581	5.8
University of Akureyri	581	5.8
Total	9976	100.0

(Source: Ministry of Education and Culture, 2000.)

organise, interpret and mediate information in an unambiguous manner. At the beginning of the interviews the participants were provided with a written introduction to the research project in which it was, for example, made clear to them that tape recordings would be erased after completion of the research. Anonymity was observed.

EMPIRICAL RESULTS

Regional Variations in University Education

Table I reveals that a university education is mainly on offer in the capital of Iceland where the University of Iceland occupies a dominant position with 6588 students in the autumn of 1999, out of a total of 9976 university students for the country as a whole. These figures are, in fact, self-explanatory. They clearly indicate that the mainstream of tertiary education flows through the capital. There are a few specialised paths of higher education in the district of Borgarfjörður and in Akureyri, but in other parts of Iceland university education is not on offer.

Furthermore, the number of persons with a university education varies significantly according to region (see Table II). Table II also shows that 6338 students enrolled in programmes of specialised and university education have permanent residence in southwest Iceland (Reykjavík and Reykjanes [2]), this being 3.6% of the total population of the area. Students residing elsewhere in Iceland make up a total of 1477, or 1.6% of the population.

Finally, it is of interest to note that the proportion of specialised and university students outside Reykjavík is highest in the neighbouring district of Reykjanes, followed by northeast Iceland, where the effect of the University of Akureyri makes itself felt. This is in accordance with new information regarding the education of different occupational groups according to region, which indicates, for example, that

TABLE II. The Icelandic student population enrolled in programmes of specialised and university education in late autumn 1996, in relation to the total national population and the eight Icelandic counties

County	Population (1 Dec 1996)	Ratio of students in specialised and university education
West Iceland	14,007	1.6
Western fjords	8,865	1.2
Northwest Iceland	9,995	1.5
Northeast Iceland	26,659	1.9
East Iceland	12,680	1.4
South Iceland	20,625	1.5
Reykjanes	71,438	2.4
Reykjavik	105,458	4.4
Total population	269,727	2.9

(Source: Icelandic Bureau of Statistics, 1997.)

over 40% of employees on the Reykjavik labour market have either completed secondary school or a university degree, while the corresponding figures for west Iceland, the Western Fjords, east Iceland and south Iceland are 17–23% (see Figure 1).

From the above it may be gathered that the proportion of persons with a university education is considerably lower in the provinces in Iceland than within the area of the capital.

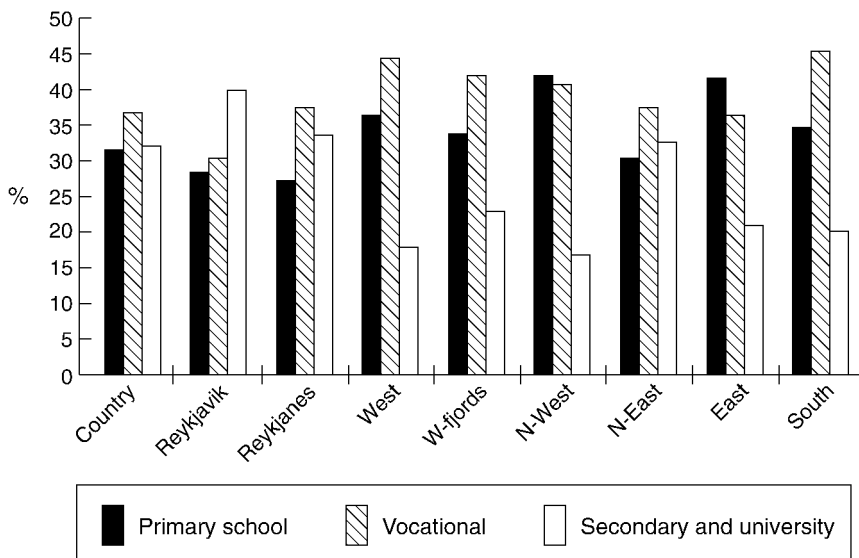


FIG. 1. The educational level of inhabitants, classified by constituency, 1996 (%). (Source: The Social Science Institute of the University of Iceland, 1997.)

TABLE III. Nursing graduates from the University of Iceland and the University of Akureyri and their areas of residence in September 1999

Place of education	Area of residence (1999)								Total (%)
	Capital area		Akureyri		Provinces		Abroad		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
University of Iceland	493	79	24	4	73	12	31	5	100
University of Akureyri	22	23	47	51	21	22	4	4	100

Comment: Nursing graduates from the University of Iceland 1987–1997; Nursing graduates from the University of Akureyri 1990–1997.

(Source: Association of Icelandic Nurses, 1999.)

University Education and Residence Patterns

Research has shown that there is a strong local effect relating to the residential pattern of university graduates, i.e. that after graduating a large proportion of students prefer to settle down where they had been studying at university. There are several reasons for this, for example that people have obtained a place to live and have also acquired a good knowledge of social life and entertainment as well as of the labour market. Examples can be provided to support this point of view. Thus, just under half the graduates from the University of Lapland have found jobs in Lapland after completing their studies and just over half the graduates from the University of Oulu in Finland have settled down in the Oulu district after graduating (Rieppula, 1998). What is the situation in Iceland? Table III shows that there is a significant difference between the nurses that graduated from the University of Iceland and the University of Akureyri, respectively, during the period 1987–1997.

Table III indicates that the likelihood of settling down in the area of the capital

TABLE IV. Business studies graduates from the University of Iceland and business management graduates from the University of Akureyri and their domiciles in 1997 and 1999 (numbers and percentages)

Place of education	Area of residence (1999)								Total (%)
	Capital area		Akureyri		Provinces		Abroad		
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
University of Iceland	2165	89	62	2	205	8			100
University of Akureyri	16	13	73	59	30	24	4	3	100

Note: The data are not completely comparable. Information regarding the domiciles of business studies graduates was obtained from the member records of the Association of Economists in the autumn of 1999. There are many members who have been educated at universities abroad. Information on business management graduates from the University of Akureyri is based on a survey of 1997 on those who had graduated and their domiciles. Nevertheless, the data provide good indications of a relationship between university education and choice of residence after the completion of studies.

is 56% higher if the nurse in question had graduated from the University of Iceland rather than the University of Akureyri ($0.56 = 0.79 - 0.23$). A similar pattern appears in the case of business management graduates from the University of Akureyri and graduates in business studies from the University of Iceland, as may be seen in Table IV. The probability of living in the capital area is up to 76% greater if the business graduate in question had graduated from the University of Iceland or a foreign university than would be the case if he had graduated from the University of Akureyri [3].

From the data presented here, it may be gathered that a university education strongly influences choice of residence after graduation. This is a case of local effect, so that there is considerable likelihood of graduates from the University of Iceland settling down in the capital area, while those who graduate from the University of Akureyri are likely to find work in Akureyri or in provincial districts.

These conclusions lend partial support to the hypothesis that universities in sparsely populated areas will attract young people locally to a university education, with a resulting strengthening of the human capital base and facilitated influx of external knowledge to the area.

University Education and Income

As already indicated, the spokesmen of human capital theory believe that investment in education yields a return in the form of increased productivity, technological innovation and higher earnings for employees. With this regard the following hypothesis was formulated:

In areas where few individuals have received a university education, employment earnings are lower than where the level of education is higher. In such areas there are also fewer technological developments and innovation is more restricted.

Is it possible to assess the value of this hypothesis with reference to data available in Iceland? It would appear that it is possible to investigate the relationship between education and pay with reference to statistical records. There is, however, insufficient information on technological developments and innovation in different parts of the country.

The first indication that improved education leads to higher earnings is provided in Table V, which shows that employment earnings are generally lowest among those who only have a primary education and that university graduates have the highest earnings.

Another indication may be obtained by studying the relationship between university education and earnings per annum. Fishing usually brings in the highest average occupational earnings while earnings are lowest in agriculture. To eliminate fluctuations of this kind it is possible to calculate earnings per man-year excluding fishing and agriculture, proceeding to calculate deviations from country averages, analysed by constituency.

TABLE V. Average monthly earnings per Icelandic person by educational level, according to a national survey ($n = 5363$) conducted by the Social Science Institute 1996–1998

Educational level	Average monthly earnings
Primary education	104,229 Ikr
Vocational education (police/mail)	114,473 Ikr
Craft, agriculture, machinist	189,402 Ikr
University entrance certificate/specialised colleges	122,057 Ikr
University degree (usually 3 years or more)	207,061 Ikr

Figure 2 shows the relationship between the proportion of inhabitants aged 18–80 with a university education and earning deviation from country average according to constituency. It may be deduced from this figure that the relationship is significant, the correlation between those two variables being $r = 0.81$. This high level of correlation comes as no surprise. It is reasonable that the variables should be closely connected at the aggregate level, since education influences earnings in many occupational classes.

The data referred to here support the hypothesis that earnings are lower in areas where there are a low percentage of persons with a university education.

INTERVIEWS

Ten business graduates and 10 nursing specialists were selected for participation in the interviews. All the nursing specialists were female while the business graduates

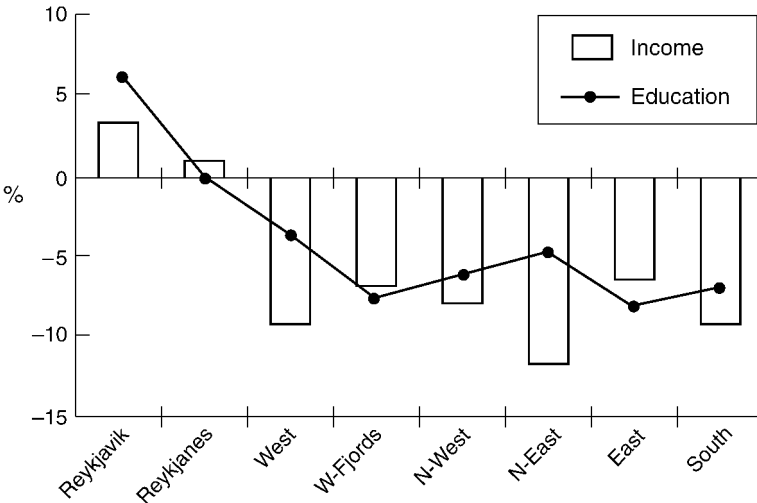


FIG. 2. The relationship between university education and earnings per man-year according to constituency. University education 1994–95 and earnings 1995. (Sources: The Social Science Institute of the University of Iceland, 1999; data from the demographic survey conducted 1994 and 1995. Cited in a parliamentary bill relating to provincial policies for the years 1998–2001, Government of Iceland, 1998.)

TABLE VI. Factors influencing choice of university

Origin	13	Surroundings	3
Family residence	14	Services	2
Influence of family	4	Access to education	6
Influence of friends	1	Information re: education	1
Spouse's occupation	1	Other	4

Note: More than one option could be selected.

consisted of one female and nine males. The age distribution of the interviewees was 13 (65%) aged 30–39 and seven (35%) aged 20–29 years of age; 12 (60%) were married or living with a partner, and eight (40%) were either divorced or single. Half of the participants had no children.

Five of the interviewees were raised in Reykjavík, 11 in Akureyri, eight in the provinces and one abroad.

The individuals selected for participation in the project were almost equally divided between the University of Iceland and the University of Akureyri, as far as their education was concerned. Nine had studied in Akureyri, 10 in Reykjavík and one person had studied at both universities.

Choice of University

One question that was put to the interviewees focused on the reasons for their choice of university. The answers indicate that origin and family residence is of crucial importance, especially for social reasons. Some also mentioned the financial benefit of living in the parental home. Two participants said their choice had been restricted to one of two departments at the University of Akureyri. On the other hand, one interviewee stated that his choice of university and subject was first and foremost connected to his wish to change his surroundings. Two of the nurses had been nursing assistants and wanted to acquire further education. Further information is given in Table VI.

Occupational Choice and Domicile after Graduation

Concerning the choice of occupation after graduating, it was found that a decisive factor relating to occupational choice was the participants' earlier experience of the workplace (see Table VII). Fourteen, of whom eight were nurses, indicated as a

TABLE VII. Factors influencing occupational choice after graduation

Professional training during study	14
Opportunities at the firm/institution during field work/professional training	9
Facilities	4
Wages	3
Career advancement	6
Other	3

Note: More than one option could be selected.

TABLE VIII. Choice of residence on leaving university

Reason	Number
Background	9
Location of family home	10
Spouse's employment	5
Environment	7
Public services	7
Communications	1
Prices	2
Other reasons	6

Note: More than one option could be selected.

main reason for their choice that they had received practical training in the ward in question and they had liked working there. Of these fourteen, seven referred to the potential they saw in the job and that it was of a varied nature and presented opportunities for gaining further knowledge and education. It is worthy of note that earnings did not matter a lot to the participants, only three having brought up this topic, and then only in the wake of some other factors. Residence also mattered. Three participants said that choice of residence preceded occupational choice, as they had decided to move to Akureyri after graduating from the University of Iceland.

The final question was what factors influenced the choice of residence on completing university. As in the case of choice of school, it is apparent that family background and the location of the family home plays a large part in the choice of residence, although not quite so decisive a part as other considerations that were taken into account (see Table VIII). The occupation of the spouse, proximity to and quality of public services, such as schools, welfare centres, etc., are of major concern for those who have a partner and children. Concerning environment, some participants considered Akureyri a very good place to bring up children: 'family friendly' was the way one person put it, but five added that they would not want to live in a community which was any smaller. In the category 'other factors' the most important was, in the opinion of the participants, employment opportunities, and this was the reason for some of the decisions to move to Reykjavík.

The results show, therefore, that the brain drain theory, i.e. the hypothesis that university educated individuals move away from provincial areas to large cities because of higher salaries, ambition, better research facilities and technical support, is only part of the story in the case of Icelandic nurses and graduates in the field of business and commerce.

DISCUSSION AND SUGGESTIONS

The results obtained support hypothesis I. Firstly, in this study of university education and residence of students after graduation the income of individuals

with only a primary school education is lower than that of other groups and the earnings of university educated persons are usually higher than in other groups. Secondly, the percentage of people in the 18–80 year old group with a university degree appears to be in direct proportion to the annual earnings per constituency ($r = 0.81$).

The second hypothesis will require analysis and support of much more extensive data. As for hypothesis III, it was sustained, in contrast to hypothesis IV. Hypothesis III was used as a basis on which to conduct the interviews with business/economics and nursing specialists. The results of these interviews indicate that the location of the family home plays a large part in the subject's choice of university and also in the decision as to where to live on completing their degree. Their experience of the working environment also plays a leading role in their decision on where to seek work at the end of their university training, especially if the participants became aware of possibilities which might benefit them later in their career. On the other hand, it is clear that the greatest choice of university subjects is still to be found in Reykjavík and that the largest portion of the 18–80 year old group completed their student entrance examination and university studies there. The next most popular areas were the Reykjanes district and northeast Iceland. The percentage in other areas was considerably lower.

As to hypothesis V, it has only been possible to present indicative evidence in its support. However, it is very clear that the foundation of the University of Akureyri has led to an increase in the number of university educated persons in that area. The human capital of the Eyjafjörður district has been developed and specialised and businesses have easier access to all manner of technical information and equipment.

Research has also shown a substantial difference between the choice of residence seen amongst students attending the University of Iceland and those attending the University of Akureyri. It is significantly more likely that nursing specialists on completing their training at the University of Iceland will remain in the Reykjavík area than if they had completed their studies at the University of Akureyri. In the same way, it is significantly more likely that students with a degree in business subjects from the University of Iceland or from a foreign university will choose to stay in the Reykjavík area, as compared with someone with a comparable degree from Akureyri.

The effects of these results on the Icelandic economy and regional development involve, to some extent, certain contradictions concerning employment. Types of employment in more sparsely populated areas are less varied than in the district in and around the capital and fewer of these jobs require qualifications gained at university level. Therefore, those who have such qualifications will most often choose a place of residence in the area around Reykjavík, where they can use their professional knowledge to the fullest extent. This poses a problem for those other areas in the country which are trying to build up new avenues of research and new types of employment. It has proved difficult to persuade educated people to move into the country areas. It seems, therefore, that education must also cater for and

become more geared to the requirements of these less popular areas, as documented by the data for graduates from the University of Akureyri. If there is a will to establish new and varied job opportunities in the districts outside the Reykjavik area, it would seem necessary to strengthen the institutions of learning in other parts of the country, but also to offer the possibility of courses at the University of Iceland through different types of distance learning. In this way, people could find employment in their own home district and at the same time make full use of their qualifications.

Concerning regional development, the results chiefly demonstrate three factors. Firstly, the greatly differing possibilities open to university graduates in the various constituencies reflect, among other things, the number of persons with a university degree working in the area. This means that entrance to a university depends greatly on the area in which one lives. This is indeed a serious failing in a century when information and information technology is of the utmost importance in everyday life and will become even more so in coming years. Secondly, the results show that a university education greatly influences employment earnings. If this is true, then those areas with a low percentage of university trained residents will in the future become low salary areas. Thirdly, the results indicate that students choose a university with their own background and family home in mind and that these factors, along with any experience of a working environment while undergoing training, weigh heavily when these individuals, after obtaining their degree, set about deciding where to live. If this is correct, the authorities must set about providing university education in as many parts of the country as possible or create an environment where people can educate themselves by a series of shorter courses at university level or by distance education linked to one of the universities already established. It is also important to arrange release studies for those already in employment and project work in health institutions and businesses all over the country.

Much of the material discussed here requires more research. It has not been possible, for example, to study whether the possibility of further education or distance education would inhibit the flow of young people out of the provincial areas. Neither has it been demonstrated in any concrete form that the number of those with university degrees seeking jobs in any particular area will increase with an overall increase in university education. It is also imperative to more fully examine such factors as whether specialist knowledge at university level is becoming more and more important in the production of more value-added goods and whether it creates more job opportunities. The official records available do not appear to be sufficient or detailed enough to answer such questions. Therefore, primary data should be collected in further research.

ACKNOWLEDGEMENTS

The research project that this article is based on was sponsored by the RANNÍS Science Fund and the Eyjafjörður District Committee. The author wishes to thank Elín M. Hallgrímsdóttir, nursing specialist MSc, for her assistance in data collection.

The initial ideas for this research project took shape within the Icelandic group participating in the multinational EU project 'Educational Governance and Social Integration/Exclusion'. The Icelandic group consists of Guðrún Geirsdóttir, Gunnar E. Finnbogason, Ingólfur Ásgeir Jóhannesson, Ólafur J. Proppé, Sigurjón Mýrdal and Þorsteinn Gunnarsson.

NOTES

- [1] The opposite view of technological development in industry is expressed in Harry Braverman's book *Labor and Monopoly Capital* (Braverman, 1974) which marked the origin of labour process theory. According to Braverman, work in the 20th century is characterised by Taylorism comprising the separation of mental and manual work through the dominant form of division of labour. This reduces the demand for education in industry, so that large numbers of workers compete for the available jobs. Such a division of labour is not only relevant to workers, but also management and clerical staff, as well as specialists. His conclusion, therefore, is that increased automation in industry will not be such a blessing to general workers as the spokesmen of human capital theory and technology appear to assume. There has been much research, in the spirit of Braverman, into industrial activities, e.g. the production of computers and software, where his main arguments have received support. Labour process theory, however, has been severely criticised. For a general discussion of labour process theory see, for example, Knight and Willmott (1990) *Labour Process Theory*.
- [2] Reykjanes is a constituency in the Southwest of the Reykjavík area. Some municipalities in the Reykjanes constituency, such as Kópavogur, Hafnarfjörður, Garðabær and Mosfellsbær are actually part of the greater capital area.
- [3] It should be kept in mind that not all business graduates in Iceland are members of the Association of Economists. Many are members of other unions, e.g. The Reykjavík Commercial Workers' Union, and a large number are executives or managing directors of companies and consequently outside any union. The figures in the table, therefore, provide only an indication as to the situation and should not be regarded as an exhaustive analysis

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