The Knowledge-based Economy, Skills and Graduate Retention.

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Abstract

The point of departure for this thesis is the observation that there now exists a new conventional wisdom, stating that highly skilled labour are a, if not the, key driver of growth in the contemporary knowledge-based economy (KE). This concept is often articulated in terms of the importance of the 'knowledge-worker' or 'talent' to the competitiveness of firms and even place. As such, in the contemporary period there is a heightened emphasis upon the role of human capital in fostering growth. At an organisational level, competitiveness is felt to rest upon finding the right 'talent' for the right job. Within the context of place, cities and regions are encouraged to compete on the basis of labour quality and as a result, place-marketing is often targeted at attracting highly-skilled, mobile knowledge workers. The knowledge-based economy narrative is also notable for an optimistic interpretation for employment expansion in which the demand for skilled labour is set to rise. This thesis explores this new conventional wisdom and demonstrates how the higher education sector has been adopted as an important adjunct within the KE narrative. The higher education sector is now under increasing pressure to meet various economic and social objectives in relation to the immediately surrounding region. The emphasis upon the need to regionalise university activity has also been extended to include the employment outcomes for graduates and more recently, their employability, in a bid to capture an expected expansion in knowledge-occupations. As such, this thesis considers the regional return to both public and private investments into higher education within the context of development towards a knowledge-based economy. It also draws some tentative conclusions about whether or not the labour market experience for graduates, in different places across the UK, accurately reflects employment expansion as predicted by the KE narrative.

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Chapter 1. Introduction

The concept of a knowledge-based economy (KE) has become common parlance amongst a wide variety of groups including academics, governments, development agencies, businesses and industry. For some, it is evidence of capitalism's new 'stable rhetorical form' widely adopted by opinion shapers in the contemporary period (Thrift, 2001). The concept itself is wide-ranging, with a number of sub-themes and highly stylised concepts. As such, interpretations remain semantically diverse. Part of this confusion is attributable to the fact that the concept arises out of and encompasses, many complex, interrelated global phenomenon such as: the processes of de-industrialisation; the increased growth in the service sector; the rapid growth of new technologies (particularly Information and Communications Technologies); the increased value placed upon the use and analysis of information for competitive advantage; the increased globalisation of markets, businesses & trade; rising incomes and changing consumer demand. As a result of these structural changes, many of the high-wage economies in Europe and North America are documented as having undergone the displacement of routine production activity to lower-cost nations. This has resulted in extensive ruminating over the future trajectory for economic activity within developed nations. As a result, it would appear that the concept of a knowledge-based economy has been positioned to take up that mantle of responsibility. It is contended that the future source of competitive advantage will be less dependent upon physical resources and raw materials and instead, more dependent upon the ability to secure competitive advantage in high-level, skill-intensive sections of the production chain. To paraphrase a platitude: *knowledge,* more than ever before, *is power.*

This thesis begins with a review of the literature regarding development towards a knowledge-based economy. It begins by considering the main narratives within the consensus view. Particular emphasis will be given to the emerging conventional wisdom that highly skilled labour are *a,* if not *the,* key driver of growth in the contemporary knowledge-based economy.

The literature review begins by presenting the economic, political and social implications which have emerged from the KE thesis. Amongst these are: new forms of industrial and organisational behaviour, new forms of territorial governance which emphasise the role of sub-national authorities; and the new implications for labour markets and skills requirements. Following on from this, the alternative readings of the KE will be presented in order to provide a critical perspective upon the paradigm's validity. In addition, special attention is given to the emerging policy implications for skills and the role of higher education within the debate. The overarching conclusion from the review is that the KE discourse marks a renewed interest in the role that educational investments may have in increasing the pace of economic development (see for example NCIHE, 1997). As a result, government is proselytising over need to make sure that the workforce is skilled enough to take advantage of the high-skills, high wage employment that the KE is expected to deliver (DTI 1998a; DTI/DfEE 2001; DfES 2003; DfEE 1999; NCIHE 1997). Increasingly, the higher education sector is articulating itself in these terms while at the same time, finding itself being incorporated into the economic and social objectives of the regional development agenda (OECD, 1999a). The literature review examines the developments which have influenced the characterisation of universities as 'engines of growth' in the knowledge-based economy. In particular it will consider the new-found emphasis upon the role of graduates in fostering regional growth and competitiveness. Given that current theories of economic growth emphasise the role played by investments in education, this thesis considers the regional return to such investments in terms of the retention and employment outcomes for graduates across different parts of the UK. This provides a snap-shot view of the labour market experience for graduates in different regions and cities. In turn, the findings are given added salience by the contemporary period's anxiety over differentiated returns to higher education; the continued expansion in student participation rates; changing funding structures for higher education and the shifting burden of tuition fees towards the private individual.

The main body of this thesis presents the patterns for graduate origin, employment destinations, and retention rates across UK regions and cities. The

analysis also considers the academic characteristics of graduates, the industries which employ them and their occupational status. This goes someway towards considering the extent to which the experience of graduates in different places reflects employment expansion as posited within the KE thesis and begins to address issues related to underemployment. The thesis comes to number of tentative conclusions about how well placed UK regions and cities are in terms of meeting the Knowledge-based Economy's high-skills agenda.

Chapter 2. Literature Review

The Knowledge-based Economy, Skills and Graduate Retention.

The review of the literature is divided into five inter-related subsections. The first, section 2.1, is a broadly based conceptualisation for the Knowledge-based economy encapsulating the many economic changes and processes which the thesis has come to represent. Section 2.2 highlights the particular emphasis placed upon the role of skills and education within the KE thesis. This it is contended, has emerged as a new conventional wisdom which suggests that a highly skilled work force is *the* most important factor contributing towards competitiveness and growth in a Knowledge-based economy. This has become a recurrent and increasingly influential theme within the KE debate. As a result, section 2.3 demonstrates how the higher education sector has been adopted as an important adjunct in the drive towards creating a high - skills, knowledge-based economy. Section 2.3 examines the newly constructed *third-role* for university activity whereby universities are under pressure to meet economic and social objectives, particularly in relation to their immediate regions. Having presented the popular reasoning behind the concept of a knowledge-based economy, the review adopts a critical stance in section 2.4, highlighting the theoretical, epistemological and empirical weaknesses within the consensus view. Section 2.5 summarises the findings from the review of the literature drawing attention to areas which reflect a paucity of research.

2.1 The Knowledge-based Economy

It is evident that the concept of a knowledge-based economy has become all pervasive in the collective consciousness and strategies of governments and businesses around the globe. This is true of the UK government which has consistently placed a great deal of emphasis upon adopting the KE approach to economic development (see DTI 1998a; DTI/DfEE 2001; DfES 2003; DfEE 1999; Labour Party, 2001). What then are the grounds for the elevated status with which the KE thesis has been accredited? In

considering this, it is a useful starting point to revisit the fundamental concepts which have gone towards shaping the theory's development.

As commented upon earlier, the processes which are often used to describe transformations towards a KE are both complex and highly interrelated. It is common, however, for most accounts to locate the origins of change within two historical time periods, namely the post-war period and the current period beginning in the 1970s. The former time period is characterised by the growth in services, the changing nature and structure of consumer demand; the rising importance of the large corporation, growth in the producer services and changes in transportation and manufacturing technologies. During this period, developed economies are said to have become increasingly complex and wealthy. These trends are said to have manifested themselves in the expansion of consumer demand and the growing need for investment in infrastructure, research & development, health and education (Amin 1999). In addition, forces such as the deregulation of financial markets, the growth in international trade and governing bodies as well as the development of 'distance liberating' technologies are said to have had the effect of internationalising the goods and the service industries. During the second period and in the wake of de-industrialisation, the dynamics of change are seen as increasingly service driven, technology driven and increasingly *globalised* rather than merely internationalised (Amin 1999; Dunning, 1992; Howells & Wood, 1993). For many developed economies the most acutely observable outcome of these changes has been the displacement of traditional manufacturing activity towards the newly industrialised nations, culminating in what has come to be known as a new *global* division of labour (Archibugi & Michie, 1997; Gordon and McCann 2000; Ohmae 1990; Coffey and Bailey, 1992; Huws et al 1999). The displacement of routine production work to low-wage economies is often narrated in terms of de-industrialisation, globalisation and the decline of *Fordist* methods of mass production and the rise of *Post-Fordism* within developed economies (Amin, 1994; Friedman 2000). In other words (and in typically orientalist fashion), the picture that is often painted characterises 'developed' nations as purposefully pursuing the *high-road* towards knowledge-intensive

economic activity and abandoning the *low-road,* consisting of routine mass-production, to low-wage nations.

As a result of global economic restructuring, conventional wisdom states that high-wage economies must compete in the high-skill, high value-added sections of production in order to maintain competitive advantage and acceptable levels of income. In turn, the high value sections of the production chain are seen to be dependent upon the processing and manipulation of knowledge and information as opposed to physical resources. It is now argued that the total value of a finished good is dependent upon the segments of the production chain in which knowledge is being created and embedded as opposed to the value of the physical materials themselves. At the extreme, this is encapsulated by the phenomenon of 'dematerialisation' or 'weightlessness' e.g. software is the quintessential product of the KE (Coyle 1999; Quah, 1996). The *dotcom* bubble of the late 1990s epitomised the conviction (amongst many at the time) that it was possible to be 'living on thin air' (Leadbeater, 1999). In this sense, the knowledge economy is presented as a radical departure from the industrial / manufacturing economy in which raw materials and physical labour are the primary sources of value. Thus in Schumpeterian terms, the KE concept is widely believed to represent a societal, technological and economic shift equivalent to that of the industrial revolution (Castells, 1996; Solomou 1998).

The newfound salience of knowledge as a factor of production arises from a critical qualitative difference that is made between *information* and *knowledge.* The former is easily replicated whereas the latter is tacit and therefore difficult to codify and replicate (Ancori et al, 2000; Tomlinson, 1999).The KE thesis valorises the latter over the former because tacit knowledge is felt to be inseparable from the collective work, social and institutional practices from which it arises (Archibugi & Michie, 1997). Lundvall and Johnson (1994) were amongst the first to create a taxonomy including four different kinds of knowledge: *know-what, know-why, know-how and know-who,* of which the latter two are considered to be strategically important in the struggle to maintain control of the high-value sections of the global production chain.

- *Know-what* refers to knowledge about facts. In this instance knowledge is equivalent to information which lends itself to easy codification.
- *Know-why* refers to scientific knowledge of principles in nature, in the human mind and in society. The ability to access and use this type of knowledge is of great importance to technological development and the speed at which advances in technology are made. The production of this category of knowledge is organised in special organisations such as universities, research & development centres etc. Accessing *know-why* involves interaction with such organisations.
- *Know-how* refers to skills. This category has traditionally been exclusive to individual firms or organisations, that is to say it is developed within their confines.
- *Know-who* refers to a number of different skills including those of a social nature. This kind of knowledge is argued to be important in a modern economy since there is a need to access a vast and diverse range of knowledge and skills. This is especially significant in terms of potential for product, process and organisational innovation as well as innovation in institutional processes.

Reproduced from Lundvall & Johnson (1994, pp. 12).

'Know-who' is characterised as place specific, inseparable from individual, social and territorial contexts. Therefore, tacit knowledge can only be purchased via the labour market as embodied knowledge or through the location or acquisition of firms in specific places (Athreye, 1998). This fundamental tenet of the KE thesis has influenced the mobilisation of 'place' as an economic asset. In other words, the KE thesis offers the possibility for endogenously driven, proactive development in which locality-based knowledge-production systems can secure employment and a reasonable standard of living in the face of global economic restructuring (manifested most tangibly in the 'off-shoring' of routine production activity towards low-cost nations), (Archibugi and Michie, 1999; Huws et al, 1999).

Much of the evidence for the KE thesis has been informed by the observation of predominantly small, high-technology companies and their ability to remain

competitive in the face of global competition and changing consumer demand[1]. It is argued that these companies were able to adapt to the changes in global competition and in consumer demand because they exhibited radical characteristics in their approach to production and competition. To use the jargon, they were *flexibly specialised* and practised co-operative competition. In particular, Saxenian's (1994) documentation of computing / electronics firms in Silicon Valley created an icon for knowledge-based, network-driven, economic success. In the face of global competition & rapidly changing consumer demand, Saxenian argued that the success of the companies situated in the valley was due to the strong social networks that existed amongst them. In other words: *know-who* as defined earlier. This feature is said to have enabled knowledge to be transferred efficiently and rapidly within and between firms as well as other institutions. This in turn, is said to have created a fertile environment for new innovations and the collective management of crisis. This sequence of events has been given the moniker of *co-operative competition.* Similarly, the *flexible-specialisation* hypothesis argued that companies that were smaller, less hierarchical and dependent upon spatial proximity were better equipped to respond to rapidly changing consumer demand and the trend towards greater product customisation[2]. It is argued that firms which exhibited these radically new forms of behaviour were able to continuously innovate both in terms of product specification and production strategy, thereby enabling them to remain highly competitive (Kenny 1996). As a result, industry success is now associated with concepts of *tacit* knowledge, *trust*, strategic *face to face* relationships and a region's social capital or its 'institutional thickness' (see Amin, 1999). This is best reflected in the large volume of work dedicated to the *new regionalism* which advocates the devolution of economic responsibility from national to sub-national authorities in response to the KE thesis (see Dodgson, 1993; Knight 1996; Morgan and Nauwelars 1999; Maskell and Malmberg, 1999; Ruchelman, 2000; Storper, 1997). More recently, Florida

[1] See for example Saxenian 1994; Asheim, 1996; Cooke and Morgan 1998; Finegold, 1991; Florida, 1995; Maskell et al 1998; Lundvall , 1992; Crewe, 1996; Fischer et al, 1999; Hingel, 1992; Morgan 1992, 1997; Storper,1993.

[2] Typically the features associated with flexibly specialised organisations are: the externalisation of transactions; processes of vertical disintegration; batch production of goods; high-tech production, and dense inter-linkages between firms that are often dependent upon spatial proximity for efficient knowledge transfer (Storper and Scott, 1990).

(2001) has rekindled interest in this dialogue using somewhat more voguish concepts such as 'diversity' and the 'coolness' index against which, places can be differentiated and their 'attractiveness' to knowledge industries and workers ascertained[3].

The self-sustaining nature of the KE model has proved to be universally appealing, resulting in the proliferation of network-based, regional development strategies aimed at increasing innovative 'capacity' and endogenous growth (see Amin, 1999; Morgan, 1997; Kirat and Lung, 1999). Thus, given the new found salience of place-specific knowledge, the KE discourse emphasises the local within the global offering an optimistic interpretation for the new realities of global competition. In effect, economic activity in the KE is expected to bring about an expansion in financially rewarding, high-value sectors of the economy. What is more, the consensus view of the KE offers a proactive path towards securing economic advantage in these highly rewarding areas of the production chain so long as economies are willing to develop the appropriate *skills to* attract such inward investment. As such, the recurrent theme within the KE approach is one of unprecedented opportunity. It is posited that the competitive advantage of companies no longer depends on the mass production of standardised goods and services but on technical innovation, applied knowledge and the intellectual capital of a highly skilled workforce (Stewart, 2001). This represents an inexorable path for economic activity based on 'high value' rather than 'high-volume' work (Reich 1991). Consequently, one of the most pervasive narratives emerging from this conceptualisation is the increased demand for highly skilled labour often generically referred to as the 'knowledge worker' or more curiously 'talent' (Drucker 1993, Florida 2001; Reich 1991; Michaels et al, 2001).

[3] In this context, diversity is used to signify an openness to alternative lifestyles (e.g. multicultural and gay communities). This interpretation of place attractiveness is measured against a 'coolness' index. Thus, the more *diverse* and *cool* a city or region is perceived to be, the greater the capacity for attracting 'talent' or in other words, the key group of highly mobile, highly skilled knowledge-workers, who are increasingly believed to make migratory decisions based upon place 'coolness' and lifestyle choices rather than direct economic factors alone. In turn, this effect is said to have a mutually reinforcing effect by attracting and supporting knowledge-industries; ultimately resulting in the generation of higher incomes and higher tax revenues.

It would appear that a fundamental proposition in the transition towards a KE is the necessity to have a workforce with the right skills to meet the demands of the new economic climate. The posited complexity of managerial roles due to globalisation, deregulation and rapid advances in technology is often translated into an organisational imperative to have the right 'talent' in the right job (Cohen, 2001). This represents a new emphasis upon the role of human resources in creating organisational competitiveness (Thurow, 1999; Mayo, 2001; Michaels et al, 2001). This is a highly significant theme within the KE literature. In the UK, it has influenced a policy response based upon the expansion of higher education and more recently, an emphasis upon the need to equip the workforce with the *employability* skills that are needed to secure employment in the knowledge-based economy (OBrien and Hart, 1999; Morley, 2001; DTI/DfEE, 2001; DfES, 2003; SHEFC, 2004). The following section examines these assumptions and the implications for skills, education and work in the context of development towards a KE.

2.2 The Role of Skills in the Knowledge-based Economy.

The KE thesis states that the competitive advantage of companies no longer depends on the mass production of standardised goods/services made by large numbers of workers performing repetitive tasks but instead, on technological innovation, applied knowledge and the intellectual capital of a highly skilled workforce (Stewart, 2001). The centrality of this assertion within the KE thesis has raised a number of important definitional issues and policy implications which relate to the nature of skills requirements in the contemporary period. Within the KE thesis, changing skills requirements are often presented in the context of changing methods of production/organisational structure and their effect upon job requirements. In other words, changing organisational structures, methods of production as well as increasing global competitive pressures are widely believed to be changing the very nature of employment and therefore, skills demand.

Firstly, production in the KE is often presented as the polar opposite to *Fordist* methods of mass production. This is an important point to note since *Fordism* is

said to have necessitated *Taylorised* forms of job design and therefore workers with relatively low skill levels. This model of production is particularly associated with the mass production of standardised good/services i.e. goods/services which have a low specification of design and content. In contrast, goods & services in the KE are presumed to be produced to a high specification (Finegold, 1999; Finegold & Soskice, 1988). As such, the greater technical/design content within high-spec goods and services is said to necessitate a highly skilled workforce. This has also been reinforced by numerous accounts relating to the *up-skilling* effect of technology in the workplace (Kenny, 1996; Nonaka & Takeuchi, 1995; Zuboff, 1988). In other words, as the working environment has become more automated, the function of the employee is increasingly to *monitor*, *analyse* and to *interpret* data hence necessitating new and arguably higher levels of skill. Other narratives focus on the effects that changing organisational structure has had upon skills requirements. It is often argued that as a result of competitive pressures, companies have become leaner, flatter and more flexible. Therefore, responsibility and decision making are increasingly being delegated to those at the forefront of production and customer interactions (Kanter 1989). In this way, workers in the KE are characterised as having to become increasingly skilled in order to function autonomously. This fits in neatly with the KE themes relating to the valorisation of tacit knowledge, human creativity and individual initiative at all levels of the production chain. ~In the contemporary period this is viewed as a rich source of efficiencies given that human creativity, initiative and experience are now viewed as *key* to securing competitive advantage in the KE (Florida, 2001; Goshal and Bartlett, 2000). As a result, there has been an unprecedented organisational emphasis upon the importance of being able to recruit and retain the best 'talent' for the workplace (Cohen, 2001).

Although the KE literature is characterised by an overwhelming emphasis upon the strategic importance of a highly skilled workforce, it would appear that the definition for, and the treatment of skills draws upon and conflates a wide variety of technical knowledge, capabilities and personal characteristics. Foe example, the definition for 'skills' often includes softer interpersonal capabilities, many of which could be conceived of as personal characteristics

which, more often than not, appear to be related to the class structure (Hodson et al, 2003; Pettinger, 2003; Witz et al, 2003). The increasing emphasis upon personal characteristics as a 'skill' is often rationalised by reference to the shift towards a service dominated economy in which value-added often stems from the presentation of image and ideas and where the product/service is often embodied in the presentation of 'self' i.e. appearance, speech and deportment (Alvesson , 2001; Bustamante, 2004; McDowell, 1997). A useful point to begin the process of compartmentalising these various interpretations of economically useful 'skills' is to refer to Robert Reich's seminal typology for labour segmentation in a knowledge-based economy (Reich 1991). Indeed Reich makes a point of highlighting a clear differentiation and indeed, divergence in the likely demand for skills. Reich's three-fold typology includes: (i) high level 'symbolic analysts' typically characterised as highly skilled and requiring extended periods of formalised education; (ii) a dwindling group of 'routine production workers' that are relatively low-skilled and (iii) a growth group involved in 'in-person services' often requiring skills that are akin to personal characteristics. Within this framework, Reich predicted the labour market ascendancy of the 'symbolic analyst' or knowledge worker. He also argued that the function of the symbolic analyst is primarily to act as 'strategic broker' between problem identifiers and problem solvers. For example, it is posited that the effective operation of high-value businesses are dependent upon three different but related skills, of which, the function of the symbolic analyst is paramount:

> 'First are the problem solving skills required to put things together in unique ways...Next are the skills required to help customers understand their needs and how those needs can be met by customised products ... Third are the skills needed to link problem solvers with problem identifiers...Rather than controlling organisations, founding businesses or inventing things, such people are continuously engaged in managing ideas. They play the role of strategic broker' (Reich 1991, pp. 84-85).

An important corollary to Reich's typology is the author's interpretation of the economic fate for each category of worker. It is widely agreed upon that the symbolic analyst or the knowledge worker will be most successful in the KE. Leadbeater (1999, pp. 228-229) observes that: 'one of the most powerful groups created are the knowledge workers: mobile, skilled, affluent, independent

...who can trade on their expertise and intellectual capital'. At the other extreme is the routine production worker performing the largely *Taylorised* and predefined tasks associated with high volume mass production (Ackroyd & Procter, 1998). Representing the very antithesis of production in the KE, this group faces the bleakest of consequences: falling incomes and foreign competition. The fate of workers providing in-person services is more ambiguous given that their services are place-specific, consumed immediately and therefore, less likely to be exported spatially.

Reich's typology for skills requirement in a knowledge-based economy has effectively become the blueprint for nearly all subsequent discourse. The concept of the knowledge worker or symbolic analyst has also become ubiquitous. More recently the concept has been revamped, emerging in the vocabulary of 'talent' (e.g. Florida, 2001; Michaels et al, 2001). As yet, the predicted scale of expansion in each of Reich's three skill categories remains a contentious issue, varying widely depending on the methodological approach adopted for the classification of occupations. For example, Reich indicated that only a limited proportion of the workforce could be employed as symbolic analysts. Cortada (2001) on the other hand suggests that as much as 80 % of the US workforce will be employed in knowledge occupations.

The KE thesis has also contributed to a redefinition of employment and industrial relations. Global competitive pressures and the drive to increase profitability (or shareholder value) have, on the part of companies become a common narrative for defending the flexibility to 'fire and hire' as and when required (Frank and Cook, 1996; Kanter, 1989). Resultantly, work roles are subject to rapid change (as consistently high levels of performance are demanded from everyone) and most significantly, the long-term career becomes obsolete. As such, the new working climate highlights the importance of taking responsibility for personal *employability* at all times. Thus, in the KE individuals are presented as changing their careers regularly whilst ensuring at all times, the marketability of their skills. This is often dubbed as the *portfolio* or *boundary-less* career (Arthur and Rousseau, 1996). This concept captures the changing way contemporary working lives are being organised, perceived of, and

articulated by employers, government, individuals and society. For some, the re-definition of the career represents a new opportunity to redefine the distribution of opportunity, work, income and status (Neef, 1998). If organisations depend upon the knowledge embodied within the workforce, then it follows that power rests with the individuals that are in possession of the requisite skills. The optimistic interpretation of this vision is that workers now embody both labour and capital, offering the promise of limitless possibilities for those with the right 'talent' irrespective of their personal background (Drucker, 1993). Interestingly, the democratisation of the workplace narrated in this way is often the premise for justifying widening income differentials and 'superstar earnings' (The Economist, 1993; Quah, 1996). By the same reasoning, those with few marketable skills face falling standards of living as they confront competition in the form of equally capable, but cheaper, labour from around the globe (OECD, 1999b; Coyle 1999; Reich 1991). As a result of this conceptualisation, the emergent consensus view equates business and even national success with high-value, high-skills production and getting the right 'talented' people into the right jobs (Drucker, 1993; Florida, 2001; Thurow, 1999). As such, in the contemporary period, the quality of human resources is often at the centre of debates about company assets, productivity and competitiveness.

Although the definition for *skills* relevant to the KE has been shown to be problematic in places, the KE approach to the role of skills in generating economic competitiveness is often commended for having brought attention to a broader picture (Coffield, 1997). As such, the role of skills in generating economic competitiveness is increasingly viewed in conjunction with factors such as product specification, competition strategies and relatedly, the effect that work organisation and job design can have in setting the criteria for skills requirements. However, most commentators agree that the success of any policy approach depends on whether the KE's interpretation of future labour market expansion holds true. In the UK, the government is clearly of the opinion that future labour market expansion will occur at the top-end of the labour market hierarchy. Government rhetoric is confident that the demand for high-level skills (often equated with a university degree) is set to grow. It is expected that 80% of the 1.7 million new jobs to be created by 2010 will be in occupations that

normally require a university degree (DfES, 2003). As such, policy statements stress that 'our future success depends upon mobilising even more effectively the ...creativity, skills... of all our people' (ibid, pp. 2). This is made all the more pressing by the need to keep up with economic competitors who appear to invest more generously in higher education e.g. 'In a fast changing and increasingly competitive world, the role of higher education in equipping the labour force with appropriate skills ....is central. The benefits of an excellent higher education system are far reaching; the risk of decline is one that we cannot accept.' (ibid, 1.3, pp. 10).

2.3 The re-orienting of Higher Education within the concept of the Knowledge Economy

The preceding section highlighted the consensus view which increasingly equates business and national success with high-value, high-skills production and getting the right people or 'talent' into the right jobs. As such, in the contemporary period, the quality of human resources is often at the heart of strategies to develop the *knowledge-based economy*. The preceding section also highlighted the lack of an authoritative definition for what constitutes economically useful skills in the KE and resultantly, there is conflicting evidence for the rate and magnitude of expansion in high-skills, knowledge-based employment. Nonetheless, it is increasingly apparent that the university sector is being re-positioned to meet both economic and social objectives as a result of the structural changes posited by the KE thesis. Universities are expected to be the means of delivery for the skills requirements of the KE and to function within systems of innovation in order to meet specifically *regional* economic and social objectives. Thus it appears that the higher education sector is under pressure to re-define and re-orient itself in light of the KE thesis. The extent to which this is a direct reaction to economic & spatial restructuring as proposed within the KE thesis; or whether it is a response to funding shortages, the massification of higher education and external pressures from development agencies, remains a moot point. None the less, it is clear that both development agencies and universities themselves are using the language of the KE to create a newly strategic role for the higher education. This is commonly referred to as

the *third role* for university activity, following on from their traditional research and teaching functions, and directed towards meeting economic and social objectives.

This section considers the newly strategic role for universities which, itself, forms a significant part of the KE approach to economic development. It begins by examining the third-role for universities whereby they are expected to meet specifically *regional*, economic and social objectives. This is followed by contextualising the new-found third-role within the historical developments of the UK higher education sector from a nationally-oriented, elitist system, to one that is more dispersed and diverse. This section then goes on to discuss the way in which universities have been adopted by regional development agencies using the defining principals of the KE thesis, as set out at the beginning of the literature review and revisited here. At the same time, reference is made to the pressures from within higher-education which are necessitating change for institutional survival - namely funding shortages, global competition, the massification of higher education and therefore, the increased demand for accountability. The empirical basis for the new model of commercially-savvy universities generating new business spin-outs and regional growth is also considered. This makes reference to the role of universities in *learning-regions*, industrial clusters as well as various studies showing a correlation between levels of higher education and new firm formation rates. These accounts are found to be heavily based upon regions already in growth sectors (an important point returned to in section 2.4 which considers the alternative readings of the KE thesis). The latter raises doubts as to the pervasiveness and transferability of the 'university as an engine of growth' model. Nonetheless, the UK university sector is felt to be well placed to adopt this trajectory for development (e.g. world renowned research universities, the large supply of domestic and foreign graduates, and free market policies that are supportive of new enterprises). The policy initiatives and funding structures for third-role activity in the UK are also referred to in order to bring attention to the incentives which have been put in place for universities to meet new economic and social targets. Finally, when reading this section, it is important to bear in mind that it serves as a prelude to the alternative readings of the knowledge-based economy which follow in

section 2.4. Its purpose therefore is to highlight the way in which universities are *expected* to function within the knowledge-based economy as defined by the majority view. As such, a critical response to the extent to which universities can *really* function as drivers of growth in creating knowledge-based industries is given full consideration in section 2.4 of this review.

It is somewhat axiomatic to observe that there are a number of positive externalities which arise from the higher education sector. Up until now, however, it can be argued that the process has been serendipitous, mostly undocumented and un-harnessed by explicit policy objectives. However, the discourse on the knowledge-based economy appears to have created a newly strategic and increasingly explicit role for universities in the economic and social development of their *regions* in particular. The basis for this newfound role is often legitimised using the language of the KE as discussed throughout the literature review so far. The end result is a growth in incentives which have been placed upon various economic & social objectives for the higher education sector to meet (OECD, 1999). Not surprising then, that universities are articulating themselves in terms of their strategic role in developing the knowledge-based economy. As such, the university is presented as an institution in which knowledge is both created & preserved and which is best positioned to respond to the fundamental economic and social restructuring which the KE paradigm represents. For example, Thanki (1999, pp. 84) states that:

> 'changes in the global economy have increased the contribution that higher education as a producer of knowledge makes to an economy and gives universities a key role to play in linking the global and the local. This potentially places universities in a position to make a large contribution to the development of their regions'.

Thus, the potential of universities to generate regional economic competitiveness has caught the popular imagination (see Etzkowitz, 1997; Etzkowitz et al, 1999; OECD 1999a; Robertson 1999; Gray 1999). This newly emphasised role is commonly referred to as the *third strand* or *third role* for university activity, following on from their main teaching and research functions and directed towards economic objectives. These include activities such as

consultancy, business spin-outs, support for inward investment, and a variety of partnership arrangements. It would be beyond the scope of this thesis to consider each in any great depth. None the less, it is a useful starting point to form a general framework which acknowledges the wide breadth of economic & social impacts which flow from university activity using, by and large, self-evident reasoning given the relative paucity of research on this topic.

First and foremost, universities are conventionally thought of as primarily being engaged in research and teaching. With this in mind, the most readily recognisable contributions of the university to the locality, region and/or nation are (a) research findings, which normally enter the public domain via published papers, lectures and so forth and (b) the regulation and supply of specialised skills for the economy (e.g. medical and other professionals, managers, linguists, scientists, engineers and so forth). In light of the KE thesis and its emphasis upon *innovation* and *skills*, both of these traditional functions are given added salience. What is more, an emergent *third role* has been identified for universities within the context of the KE, explicitly manoeuvring university output towards economic and/or social objectives.

More often than not, the third role has a clear geographical context, greatly influenced by the KE thesis's emphasis upon regionalism (as discussed earlier in section 2.1). In other words, economic/social objectives are often directed towards the *region* in which the university is located[4]. What follows is a brief consideration of how universities are thought to contribute towards the KE. The points raised represent the increasing pressure from development agencies upon universities to meet economic & social objectives; as well as the new language in which universities are increasingly articulating themselves in light of policy incentives, funding shortages and increasing pressure for accountability. Considering the third role in terms of economic objectives, the contemporary

[4] The word region is italicised firstly, as a result of the associated (and now widely recognised) definitional problems e.g. a region can differ greatly in size and can be defined at a sub or even pan - national scale. Secondly, the use of italics emphasises the complex nature in which universities often relate to their locality or region e.g some universities have an allegiance towards an international research agenda, thereby having little interest in the local. Although, ironically, for universities in core economic areas, the local is very often the global (e.g. the research interests of premier universities in areas of cutting-edge industry) !

period is marked by an eagerness on the part of universities to highlight their role in *knowledge-transfer, technology-transfer* and/or *science-transfer* activities. These phrases commonly refer to collaborative research conducted between universities and industry with the aim of stimulating innovation and competitiveness amongst firms. The concept of knowledge-transfer has also widened to include temporary work placements for graduates [5]. Another objective for the *third role* is the development of entrepreneurship with the aim of creating new *spin-out* companies. This approach often revolves around the provision of business incubation support to graduates with commercially viable ideas. Academics too are increasingly encouraged to commercialise their university research via the creation of spin-out companies, collaborative projects with industry, and the provision of consultancy services. The third role for universities also incorporates social objectives. Amongst the most prominent are the widening participation agenda and the provision of accessible education to a wider demographic. Within the context of the KE, such objectives are felt to be necessary on the basis of an expected expansion in knowledge - occupations (typically requiring a university degree); combined with a trend towards the *portfolio-career* and *life-long learning* in which an individual is expected to undergo many career changes and moreover, to be solely responsible for maintaining their 'employability' i.e. continuously upgrading their existing skills (these trends are discussed in greater depth earlier in section 2.1). The university sector is expected to become a key method of delivery for these new demands.

It is worth pointing out that universities are often massive generators of employment, income and expenditure within their localities, regions and nation. In other words, they employ a vast number of local people, boost local economies through investment and consumption patterns and make significant contributions to GNP. However, there are other more subtle mechanisms through which universities are able to contribute towards development. For

[5] Scottish enterprise have established 'Graduates for business' a work placement scheme aiming to match graduate skills with business needs in order to boost productivity (details are laid out on the website www.scottish-enterprise.com/sedotcom_home/services-to-business/people-and-skills/).

example, universities and academics are often part of various urban / regional / national consortia offering advice on competitiveness strategies, regeneration, place marketing, inward investment as well as the development of better public policies. This often involves formal or informal exchanges with regional development agencies, civic authorities, chambers of commerce, industrial bodies and so forth. Universities also foster relations on an international scale through staff and student exchanges, research collaboration and conferences. This can be regarded as an additional means by which universities can link the global to the local. Universities also have a role in cultural networks, promoting cultural heritage and adding to cultural resources through the provision of museums, theatre and cinema. They can also be noted for having an impact upon the built environment, architecture, city regeneration, ICT infrastructure, sustainable development, land use and temporary labour markets (given that many students often plug a demand for part-time/casual labour). Increasingly, universities and their academic staff are often called upon to interface with the general public via media commentary, offering a local spin on global current affairs and/or scientific developments. All of these can be considered to be some of the more subtle and less documented externalities which arise from the distinctive nature of university activity. Some of these can be considered to have little direct economic value but reflect the distinctive nature of education for it's own sake rather than for any specific economic return. As a result, the *third role* appears to have created an identity crisis amongst universities and academics. In the UK, the commercialisation of knowledge appears to confront the traditional concept of knowledge as a public good. The third role also presents new difficulties in the way in which universities relate to their locality as well as to each other. For example, collaboration often goes against traditional patterns of competition amongst universities and the realignment towards localised demand is often an anathema to institutions traditionally concerned with the dissemination of high culture. The nature of change and the way in which individual universities are responding, is beyond the scope of this thesis to consider. However, it is clearly evident that universities *are* under pressure to change traditional relationships / allegiances and patterns of behaviour (especially in terms of greater regional interaction), not only as a response to

changes proposed by the KE thesis but for their very own survival and long-term economic viability.

It is often noted that the HE sector in the UK has evolved from an elitist system of nationally-oriented institutions, to a more diverse and regionally dispersed one. Chatterton (2000, pp. 62) voiced the opinion that traditionally universities 'have largely been linked to international and national academic communities, have enjoyed high levels of institutional autonomy by nationally regulated, assessed, and funded systems of higher education, and have met the needs of a nationally oriented labour market and research agenda'. Similarly Shattock (1994, pp. 146) stated that universities in the UK 'developed as national homogeneous institutions' and that they 'never gave serious consideration to creating policies that were explicitly related to local or regional needs'. Goddard (in OECD, 1999a, pp.10) follows in much the same vein, identifying the nation-building role of the traditional university : ' In the past, higher education in most countries was primarily funded by national governments to meet national labour market needs for skilled man power and to provide a capacity to meet national research and technological development needs'. This theme can also be extended to the cultural role of the university. Chatterton (2000) identifies the 'development of cultural values and infrastructure at a national level' as well as the dissemination of 'high culture to the community as part of the paternalistic, civilising mission of higher education'.

Thus, traditionally universities and the nature of higher education have been to a large extent, nationally oriented. However, as a result of the economic and spatial implications posited by the KE thesis, it is argued that the HE sector must undergo significant reshaping (Readings, 1996). It is contended that in a climate of economic restructuring and financial pressures, the HE sector is required to strategically reconsider the *region* within which it operates. The OECD (1999a) makes the case that either implicitly or explicitly, government is encouraging the involvement of universities in regional development. The OECD (ibid) identifies the regional development agencies as placing a new set of demands upon universities. The bases for these demands are felt to have been prompted by economic and administrative changes. Amongst these are the structural

changes proposed by the transition towards a KE, as discussed earlier e.g. a pervasive belief in the rising demand for high-level skills in response to a projected expansion of jobs in a knowledge-based economy (Lundvall and Boras, 1997); the increasing rates of technological change; new ways of organising the production and distribution of goods/services (Gibbons et al, 1994); new patterns of urban and regional development arising from the greater mobility of capital and labour; the decline of industrial/manufacturing sectors and the emergence of new ones (Graham & Marvin, 1997). Other factors include: changes in the mission for universities within a system of mass higher education (DTI/DfEE, 2001); changes in the structure of government i.e. the creation of regional development agencies and devolution in the UK (Tomaney, 2000; Glasson 2003). These trends have been accompanied by pressing financial pressures and changing funding structures in the UK (Gray 1999). Commentators have argued that in the UK, funding shortages and the re-introduction of tuition fees have exerted the most pressure upon universities to exhibit greater accountability for the quality of their service and their contribution to the locality. Meanwhile, with the massification of higher education, the retreat from student grants and the grievances from business and government that higher education should prepare students for work; community and employer relevance is said to be inevitable (OECD 1999a). Increasingly, it is in the HE sector's interest to articulate itself in terms of the KE and the contribution that it makes to the locality.

The demand for an instrumentalist and expanded higher education sector once again, has been influenced by much academic research undertaken in regions that are already successful in growth sectors (Lawton-Smith & Bernady 2001; Gordon and McCann, 2000; Dahlstrand & Jacobsson, 2003; Piccaluga & Lazzeroni, 2003; Loasby 1998). The growth of knowledge-based clusters in these localities, typically feature high company birth-rates and high levels of investment in public and private research (Henry and Pinch 2000, Keeble and Wilkinson, 1999). Research universities are frequently featured as the core institutions within such successful regions (Florida 1995). The relationships between research universities and the firms surrounding them are often presented as examples of 'learning regions' (Florida 1995; Finegold 1991;

Miner et al 2001). Within this paradigm the university is seen as a source of highly skilled labour, a source of knowledge and new ventures, even as a contributor to effective democratic governance and economic success (Lindholm Dahlstrand, 1999; Putnam et al, 1993). Firms are said to support university research while benefiting from having access to highly skilled graduates and advanced research findings. Furthermore, the universities within this system are noted for being a source of numerous entrepreneurial graduates with viable business ideas. Interestingly, the latter approach to business start-ups is said to mark a departure away from unemployment-led models of self-employment. Acs and Armington (2004) observed that the literature on new business formation rates and self-employment throughout the 1980s presented the process as a response to high levels of unemployment whereas more recently, the focus has been on *high-technology* start ups. As a result, the research focus in this field has shifted towards the effect of human capital and education differences on new firm formation rates across regions (Acs and Armington, 2004; Audretsch and Fritsch 1994; Keeble and Walker 1994; Sutaria 2001). A number of studies have shown that university graduates, particularly engineers, provide a valuable supply of labour to local firms and therefore, new start ups are often correlated with the proportion of engineering/science graduates in an area. Other studies (such as Anselin et al 1997, 2000) found that in technologically advanced industries, those individuals with higher levels of skills and expertise were also more likely to start up businesses. This has led to the widespread adoption of the view that regions with higher levels of education are more likely to have higher business start-up rates. Thus, it is now a commonly held view that research universities combined with an entrepreneurial 'culture' amongst academics & graduates are the key elements in the creation of *high skills ecosystems* (Baptista 1998; Finegold 1991; Galbraith, 1998; Prevezer, 1998; Saxenian 1994). It is widely perceived that the UK university sector is suitably placed to follow a development trajectory similar to those documented in the literature[6].

[6] In particular, the UK is felt to share many characteristics with the US system of HE including: world renowned research universities, the large supply of domestic and foreign graduates, the specialised infrastructure to support start-up firms and free market policies that are supportive of new enterprises (Baptista & Swann 1998; Finegold 1999; Shohet 1998).

As a result of the centrality given to the HE sector within the KE narrative, a significant section of policy discourse has been concerned with HE's contributions to regional development especially in relation to the commercialisation of research (DfEE, 1999; DTI 1998a; DTI/DfEE, 2001). Government policy statements have promulgated the instrumentalist role for higher education in creating economic growth, supporting innovation and the creation of clusters:

> 'The role of our universities is crucial. They are powerful drivers of innovation and change in science and technology, the arts, humanities, design and other creative disciplines. They produce people with knowledge and skills; they generate new knowledge in a range of environments. They are also the seedbed for new industries, products and services and are at the hub of business networks and industrial clusters of the knowledge economy' (DTI/DfEE, 2001, 3.13).

As such, many regional development agencies and devolved government have explicitly adopted universities into their regional economic strategies (Benneworth 2001, Charles and Conway, 2001). There has been a development of the *third strand* agenda i.e. funding for outreach and entrepreneurial activity. Following the DTI White paper in 1998, 'Building the Knowledge-driven Economy', funding was provided for the establishment of 12 Science enterprises Centres, providing a focus for commercialisation and entrepreneurship. Other initiatives include the University Challenge Initiative which provides new businesses with funding and more recently, the Higher Education Innovation Fund. In 2001 the DTI/ DfEE White paper 'Opportunity for All in a World of Change' launched the initiative to establish regionally based University Innovation Centres focussed on collaboration between HEIs. In Scotland and Wales, under devolution, there has been the Welsh Knowledge exploitation fund and the Scottish Knowledge Transfer Grant. Universities are also part of the regional development authority's (RDA) cluster strategies aimed at the encouragement of 'knowledge based' industries. RDAs have been required to identify 'business-led' clusters and develop the means by which their region's universities and institutes can support entrepreneurship and business growth

within them (Peck and McGuinness, 2003). The enterprise, skills and innovation white paper (DTI/DfEE, 2001) outlines government intentions to ensure that 'universities and other research establishments have the capability and the incentives they need to reach out to the wider world of business and the community' (ibid pp. 55). Within the Scottish context, the rhetoric is desirous for universities to play a key role in regional economic development. The Scottish Higher Education Review stated that the higher education sector is increasingly having to be 'well connected to local economies and communities, and other parts of the education sector, spinning off new firms, creating jobs and contributing to regeneration and cultural partnership' (Scottish Executive, 2000b, pp. 3). The regional economic strategies set out by the Scottish Executive (Scottish Executive, 2001a & 2000b) prioritises the creation of strategic partnerships between higher education and the regional development bodies in order to facilitate the commercialisation of academic research. In particular, there is a strong emphasis upon exploiting scientific research for the purposes of growing Scottish businesses (Scottish Executive, 2001a).

Thus, the principle point at the heart of the KE thesis is the shift from a low-skills economy to one that is based upon high-skills and thus resultantly, high wages. In light of this, the consensus view emphasises the strategic importance of skills and education in the bid to capture the employment generated by the global economy (SHEFC, 2004). This narrative has placed regional and national levels of skills and educational attainment at the forefront of debate and policy formulation. Amongst the most observable consequence of this, has been the new centrality given to universities and the HE sector as 'drivers of growth'. Within the literature, universities are identified as a source of new business start-ups through the commercialisation of their research. They are also identified as providing a supportive infrastructure to local businesses through knowledge transfer in the form of cutting-edge research, consultancy services and more importantly, by the provision of a skilled workforce. The latter point appears to have grown in prominence over recent years both as a result of the popular reasoning behind the KE thesis and perhaps, more likely, the continued *massification* of HE. As such, there has been a marked emphasis upon the need for graduate retention in regions. The logic

being, that graduates from local universities represent a pool of entrepreneurial and managerial talent for the local economy (Florida, 1999). The potential for universities to have a direct impact upon local labour markets is a concept which has grown in popularity, perhaps as a result of the rising pragmatism over the limited potential for universities to directly generate growth industries given problems associated with the nature of funding, traditional identities and relationships (important points discussed in greater depth in section 2.4). As such, the effect that university graduates can have upon local labour markets appears to present a direct and immediate means through which HEIs can respond to the regional economic & social agenda. This is widely reflected within the KE rhetoric which emphasises a region's stock of graduates as an indicator of place competitiveness i.e. the *quality* of the labour force (Knight, 1996) or using a more fashionable term currently in circulation: 'talent' (Florida, 2002).

Universities have clearly been adopted as important adjuncts in the drive towards creating a knowledge-based economy. Numerous policy initiatives have often placed them at the heart of innovation related strategies. In this context, the HE sector is characterised as a source of commercially viable knowledge that can have an impact upon the economy both at a regional and national scale. However, a growing awareness about the complex nature of university interaction/competition and the limited extent to which they can generate new businesses has led to an increasing emphasis upon knowledge transfer through the graduate population. In many ways, this is the conventional means by which universities have always contributed to national economic competitiveness. However, in light of the KE thesis, far greater emphasis is placed upon the contribution of graduates towards the competitiveness of local businesses and *regional* economies in particular. In other words, universities are having to re-consider non-traditional graduate recruiters. This has broadly translated into an emphasis upon encouraging small and medium sized companies to employ graduates thereby enabling them to benefit from hiring 'thinkers'. This is reminiscent of Finegold's emphasis upon the potential of using the HE sector to jack UK businesses out of a low-skills trap (Finegold, 1999). The higher education system is also characterised as an effective means to meet the rapidly

changing nature of skills demand in the new economic climate. In other words, the rapidly changing nature of economic activity in the KE is held accountable for the rapid obsolescence of newly acquired skills, which in turn, is felt to necessitate a continuously responsive system of education and re-training. Therefore, the HE sector is seen as key in anticipating and delivering these changing skills and competencies (Lindholm Dahlstrand and Jacobsson, 2003). At the same time, there is increasing emphasis upon the need to localise university curricula by drawing upon the specific needs and characteristics of the surrounding region (OECD, 1999). It is argued that the creation of specialist locally-oriented courses can give HEIs a competitive edge and offer graduates greater success in regional labour markets. This conceptualisation appears to complement the trend in the ongoing expansion of higher education and the continued increase in graduate numbers. It also appears to have been adopted by those concerned with the out-migration of skilled, young people from peripheral regions towards core economic areas. As such, the perceived positive labour market contribution made by graduates or *talent* and the need to retain them has emerged as an important theme within the KE narrative. However, the frequency with which the theme is alluded to within the literature belies, what is in fact, a very under-explored area. As such, very little is known about the flow of graduates into local labour markets and their experiences within them. Given over a decade of massification in higher education, the real labour market experience of an unprecedented number of graduates and whether or not labour market expansion reflects the KE thesis would appear to be highly pressing issues indeed.

To summarise, section 2.3 has emphasised the wide breadth of positive externalities which arise from university activity. Many of these externalities can be considered to be self-evident, and long-standing in nature. Many of the externalities from university activity reflect the distinctive nature of higher education and therefore are difficult to quantify and remain by and large undocumented, serendipitous processes. However, in light of the KE thesis, universities are increasingly portrayed as having a strategic role in contributing to the development of a knowledge-based economy. In particular, the commercialisation of university output, and the fulfilment of social objectives

are noted for having become increasingly incentivised by government and regional development agencies. This has been dubbed as the *third-role* for universities following on from their traditional teaching and research functions. This is presented as a revolutionary development necessitating the formation of new relationships with the immediate locality / region. It must be pointed out that it remains beyond the scope of this thesis to consider all the economic, cultural and social contributions that universities are able to make towards their localities and regions. As such, the emphasis throughout has been placed upon the third-role agenda given that it articulates itself using the language of the knowledge-based economy and the structural changes that are posited by the KE thesis. Section 2.3 has indicated that universities have come under increasing pressure, particularly from those involved in regional development, to meet explicitly economic and social objectives. The reason for this is by and large accredited to the shift towards a knowledge-based economy in which skills, education and innovation are strategic in the bid to capture employment generated by the global economy. Section 2.3 has indicated that regional development agencies increasingly view the HE sector in these terms and that universities themselves (whether as a response to economic changes or financial pressures) are articulating and validating themselves using the language of the KE thesis. Clearly there has been a re-orienting of the university away from an autonomous institution concerned with knowledge for its own sake towards one that is engaged with meeting regional economic and social goals. It remains unclear as to the extent that universities can really become the 'drivers of growth' and 'seedbeds for new industry' as the rhetoric would suggest (DTI/DfEE, 2001, 3.13). An increasing interest in this topic has uncovered a number of deeply entrenched problems related to university identities and funding structures which may inhibit this vision. This important point is returned to in more depth in section 2.4. As a result this section identifies an increasing popularity for knowledge-transfer in the form of the graduate population. Given that it is unlikely for all universities to be engaged in the high-tech vision of cutting-edge research and business spin-outs, interest has increasingly been focussed upon the potential for universities to enhance regional skill levels via the graduate population. This is presented as a more direct, realistic and immediate means of knowledge transfer. Universities and

development agencies already make widespread reference to the importance of graduates, 'thinkers' or 'talent' for regional competitiveness. In effect this amounts to a new conventional wisdom in which skills are considered to be the most important factor of production within a knowledge-based economy, and resultantly, there is a heightened imperative to equip the workforce with the correct skills in order to capture a predicted expansion in knowledge occupations (DTI/DfEE, 2001; DfES, 2003). As such, universities have been adopted as important adjuncts in meeting these new demands. For all the emphasis placed upon the importance of *talent* (often defined as individuals with a university degree) within the KE themed literature, the review draws attention to the shortage of evidence documenting the way in which graduates are absorbed into labour markets, especially regional ones. This paucity of research is significant given the relentless rhetoric over the importance of attracting and retaining 'talent' in regional economies and the newfound emphasis upon the need to regionalise patterns of graduate employment as a means to achieving this. The following section considers the alternative readings for the knowledge-based economy, highlighting a wide variety of weaknesses and shortcomings. Amongst these are the problems associated with the blanket characterisation of the university as an 'engine of growth' and the misconception over the linear relationship between levels of education and economic growth.

2.4 The Alternative Readings of the Knowledge-based Economy.

It can be argued that knowledge creation has always been central to economic success. In other words, it is axiomatic to say that economic growth and productivity rests upon the capacity to create new commodities and new production processes. As such, critics argue that the concept of the KE, as well as the proposition that economic success requires place-specific assets is hardly as revolutionary as the KE literature would suggest[7]. Nonetheless, the consensus view of the knowledge-based economy articulates itself in terms of societal and

[7] For example, UK manufacturing in the 19th century is characterised by networks of highly innovative firms, often dependent upon relationships between key individuals/families and networks of supportive institutions (Landes, 1999).

technological breakthroughs unlike any other. However, as the commotion over the concept begins to subside, a number of highly constructive criticisms have emerged. By and large, these are most often targeted at conceptual and epistemological weaknesses and a lack of robust evidence to substantiate the pervasiveness with which the thesis is presented.

One of the main criticisms targeted at the KE thesis is that the ideas which it encapsulates are poorly defined or *fuzzy*. Markusen (1999, pp. 870) defines a fuzzy concept as 'one which posits an entity, phenomenon or process which possesses two or more alternative meanings and thus cannot be reliably identified or applied by different readers or scholars'. Similarly Collier (1997) accuses the hypothesis of bad abstraction. Markusen (1999) was amongst the first to adopt a polemical stance towards the wave of enthusiasm for KE themed literature. In particular, she rejected the KE thesis's emphasis upon tacit knowledge as the basis for spatial re-agglomeration and notions of co-operative competition. As a result of 'conceptual fuzziness', Markusen argued that these phenomena (which are defining elements of the KE), are 'characterisations' based upon narrowly selected evidence. In particular, Markusen (ibid, pp. 872) attacks the literature for having become 'increasingly permissive about the quality of and the necessity to include evidence in published research'. As a result the author argues that there is 'an increasing emphasis on process, rather than structure, agency and performance' and that within the literature:

> 'authors get by with characterisations in which agents disappear, causal connections need not be made and processes rather than deliberative human acts are responsible for the built environment and the distribution of economic activity across space'[ibid, pp. 870].

In a similar vein, Lovering (1999, pp. 384) argues that elements of the KE concept are not clearly defined but rather, that they are ' a set of stories about how parts of a regional economy might work, placed next to a set of policy ideas which might just be useful in some cases'. This, it is argued leads to the 'classic error of bad geography' thereby 'confusing development *in* a region with development *of* a region' (ibid).

The new potential for participative industrial systems which are said to be encouraged by co-operative strategies at the local level (as in the popularised view of Silicon Valley) have also come under scrutiny as alternative accounts have highlighted the non-locally embedded nature of firms, the dominance of large firms and the high rates of lawsuits as counter evidence (Lovering, 1999; Markusen, 1999; Simmie, 1998). Markusen's alternative interviews with firms in Silicon Valley cast considerable doubt over the extent of endogenous growth in the region. She finds significant and important linkages amongst firms that are external to the region, the strategic importance of large defence contracts and an absence of porous boundaries amongst firms. Other studies show that networks of firms and subcontractors are in fact characterised by sharp asymmetries in power (Hudson et al, 1997). Furthermore the recent history of escalating mergers and acquisitions is said to be indicative of the intensified centralisation of capital (Athreye 1998). As such, global corporations are still viewed as dominating the hegemony, frequently being at the centre of network relationships. The overall effect of these shortcomings is said to be the mistaken view that a region's economic dynamism is entirely endogenously driven. The co-operative competition literature is also accused of having fundamental flaws on methodological grounds. It is argued that the studies examining co-operative competition do not address the issues of interview bias, truthfulness and neutrality (Markusen 1994 ; Healy and Rawlinson, 1993). These findings present serious flaws within one of the most influential narratives in the KE literature. Thus, the alternative reading of the KE thesis highlights the failure of the consensus view to accurately depict causal relationships. As such, the accolades of endogenously-driven and flexibly specialised regions, such as Silicon Valley, are said to divert attention away from the reality of uneven development, heightened interregional competition and the handing over of responsibility from national to sub-national governments in ways that 'seem implicitly to accept if not applaud these trends' (Markusen 1999, pp. 875).

As referred to earlier in the literature review, *flexible specialisation* is also a defining concept within the KE discourse (Friedman, 2000; Storper, 1997; VanDijk, 1995). Markusen identifies it as another fuzzy

concept in which it is difficult to ascertain which firms and industries are flexibly specialised. Her review of the literature suggests that some consider the production process as being flexibly specialised, while to others the concept applies to firms and workers and even to regions as a whole. The hypothesis also faces criticism in that it is applied to a narrow set of industries, namely high-technology firms in Silicon Valley and the Los Angeles based movie industry. Markusen contends that these sectors are outliers in the US economy and therefore poor indicators of the pervasiveness of the *flexible-specialisation* hypothesis. In addition, some studies have cast doubt on the processes relating to changes in the construct of consumer demand towards increasingly customised products. Luria (1990) posited that worsening income distributions (rather than a demand for greater customisation) had been a major influence on product differentiation. The author also found that product differentiation was restricted to a limited number of industries and that processes of dispersion rather than re-agglomeration had occurred. As a result, these studies provide alternative demand and supply side hypotheses for flexible specialisation.

Perhaps the most important implication emerging from the alternative readings is that the policy impact of the consensus view may be limited as a result of the unclear relationship between agency and responsibility. Markusen (1999, pp.880) even proposes that the narrative may constitute a form of 'provincial boosterism' in many cases. In addition the author draws attention to the inevitability built into the KE narrative which implies that governments, businesses and individuals are unlikely to have control over their own or collective identities (Markusen, 1999). The latter is felt to be potentially useful to those harbouring vested interests. For example Lovering (1999) uses the example of Wales to justify this point. He argues that the reported economic successes in Wales have been grossly overestimated and misrepresented by groups 'infected by boosterism' and/or harbouring vested interests (ibid, pp. 381). The author goes on to argue that a number of economic indicators contradict such overly optimistic findings. Instead, Lovering contends that there has been a bias towards a narrowly selected set of industries misrepresenting the character of employment change and the underlying factors causing it.

Other criticisms of the KE hypothesis have been directed towards the inherently *productivist* bias, the *microeconomic* focus, and a *reductionist* or *rationalistic* approach (Lovering, 1999; Markusen, 1999). The productivist bias is said to arise out of a neo-mercantilist prejudice which favours the manufacturing exporter (Lovering ibid). It is argued that this results in the overshadowing of the significance of other sectors such as the service sector, finance capital and the public sector in contributing to the development of regions (Scott, 1998). In other words, the manufacturing exporter within any region is assumed to be the singularly most important driver of economic growth. Similarly, it is suggested that to speak of the imperative for regions to be competitive is uninformative and constitutes a mercantilist bias towards larger firms, international business and high-technology, thus ignoring political, social and economic issues (Krugman, 1996; Eisenschitz and Gough, 1998). Keating (1997) suggests that by stating the resurgence of the region as a straightforward corollary to globalisation, the KE themed literature fails to address the political construction of markets and economic actors.

The emphasis given to co-operative networks of firms and institutional actors in the KE approach is also said to exhibit a narrow microeconomic perspective and a disregard for macroeconomic issues (Brenner, 1998). In contrast, political economists argue that the current emphasis upon the need for perpetual innovation within firms cannot be taken as a given but must be viewed within the wider perspective of historical developments such as trade and investment policies, macro-economic policy, the decline of profits and the constraints in redistributive policies (Schmitt and Mishel, 1998; Michie and Smith, 1995). Critics commenting on the regionalising forces within the KE discourse have also highlighted a *rationalistic* bias especially with regard to finance capital and the increase in short-term speculative investment flows which (irrationally) overwhelm long-term development based investment (Arrighi, 1994; Glyn, 1995). To illustrate this Lovering (1999, pp. 390) gives the example of the Asia pacific crisis of 1997 – 1999 as an example of 'the increase in government policies to maintain an overvaluation of capital and a bias towards the acquisition of wealth rather than material production'. He suggests that macro-economic forces such as these are often absent from the KE debate and that

these are more likely to have an impact upon regional development than theories based upon endogenously driven, knowledge-based development. This is analogous to Markusen's argument relating to the misconception of the drivers of growth in Silicon Valley.

Therefore, questions relating to economic and political power remain marginalised within the literature. Some suggest that the KE discourse is a process of policy transfer from the USA reflecting a growing consensus amongst corporate and political elites about the de-construction of national collective conventions established by the capital-labour accord in the mid-twentieth century (Michie and Smith, 1995). Furthermore, it is asserted that such a consensus has not arisen from a technical advancement in the understanding of endogenous economic development but instead, from a political shift towards property owners and the interests of finance capital (Brenner, 1998; Lovering, 1999; Schoenberger, 1998; Weis, 1998). As such, the KE concept and sub-themes such as regionalism are often directly linked to the growth in new regional bodies (Lovering, 1995; Garmise, 1997). For some this is evidence of the growth in a new 'service class' for whom, such concepts have been specifically created (Markusen, 1999).

So far, the KE narrative has received thorough criticism on a number of theoretical, epistemological and empirical grounds. More recently however, the conceptualisation of employment change, and the treatment of education & skills within the KE discourse, has come under particular scrutiny. The central justification for the KE thesis is the shift from a low-skills economy to a high-skills one. It is a commonly held view that this will segment the labour market along the lines of Reich's three fold typology as discussed earlier (Reich 1991). Needless to say the expected proportional growth in each category remains a highly contentious issue. Nonetheless, the consensus view in the UK predicts that 80% of all new jobs in the near future will be in knowledge occupations requiring a higher education degree (DFES 2003). Given that this is the new conventional wisdom, there still remains significant confusion over the definition for skills and its role in economic competitiveness. In the UK criticism has been directed towards the confusion over the role of theoretical

knowledge within qualifications and the narrow conception of useful knowledge which is said to be concentrated on lower, task-specific skills (Green 1998). Others have argued that the shift away from technical expertise towards softer interpersonal capabilities, may not meet the needs of the high tech sectors discussed by a sizeable section of the KE literature where theoretical knowledge and leading edge developments are the key to sustaining competitive advantage (see for example Finegold 1999). Thus, it has been argued that a training system which is biased towards the needs of the service sector is potentially a problem given that it does not meet the needs of a high tech 'knowledge economy' (Coffield 1997). Paradoxically, commentators have also questioned the assumption that producing relatively high-tech products such as computers and IT equipment requires a highly skilled workforce. It is argued that the majority of workers in these manufacturing sectors often require manual skills such as dexterity, concentration and attention to detail e.g. workers who solder circuit boards (Kenny 1996). The broadening of the spectrum under the term 'skills' renders the imperative for universal *upskilling* in a knowledge-based economy difficult to implement. Nonetheless, conventional thinking as represented in the white paper (DTI 1998a) remains convinced that employment growth will be at the top of the labour market hierarchy and that therefore the demand for higher levels of skill is booming. This contention is increasingly coming under scrutiny on the basis that such calculations are inappropriately made using a trend assumption based upon an unprecedented growth period during the 1990s (Brown & Hesketh, 2004).

Another concept which has arisen out of the KE thesis and which has also come under scrutiny is the vision for universities as 'engines of growth'. Contrary to this analogy, the causality between a concentration of research institutions and the generation of highly innovative firms has been shown to be unclear. Doutriaux (2003) highlights the lack of evidence to support the claim that universities are drivers of economic growth. Doutriaux (ibid) clearly presents the very varied histories of university engagement with their local economics and shows that organisations other than universities are major players in stimulating economic growth. In addition the author also points out that the existing industrial base is also a major factor influencing high-tech development

and university-industry links. As such it is easy to overplay the regional agenda since studies such as Doutriaux's have shown that many HEIs prefer a model of indifference towards the regional agenda. For example, Boucher et al (2003) finds that it is the structural, institutional and social factors that interact to shape the participation of universities in their region's development. The interactions of these factors are shown to either foster or hinder the contribution of universities to their region's development. The factors may include: the extent of the regionalisation of the higher education system; regional identity and networks; type of region and type of university. The extent to which universities engage with their regions has also been found to be dependent upon the competition and hierarchy effects between universities in a region (Doutriaux,2003; CURDS, 2001). In certain cases, it appears that the culture within universities inhibit collaboration. It is recognised that there are barriers to collaborating with universities due to the highly competitive nature of relationships that exist between institutions. Thus, the strategic role for university-business linkages in the development of regions is increasingly coming under scrutiny. However, despite the attention paid to the nature and extent of university-business relations, the lack of attempts at measuring such interactions and their impacts has been remarked upon(Thanki 1999). Studies into the effect of universities upon the development of their localities are usually limited to income and expenditure effects. Thus, as a result of the new emphasis upon the regional role for universities in a KE, there have been a number of calls for more extensive and varied analysis into the contribution of universities to their localities.

The prescribed role for universities in enhancing the industrial competitiveness of their region is central to the government's concept of development towards a knowledge-based economy. However, this is increasingly being called into question by more cautious observations relating to the overemphasis given to the ability of universities to generate innovation through the creation of business links and technology spin-offs (Charles & Benneworth, 1999). This is due to a number of associated and deeply entrenched problems relating to funding

structures, cultural differences as well as the formulation of policy[8]. Instead universities are increasingly viewed in terms of a supportive role, especially in terms of high-tech development through the provision of skilled labour. Increasingly graduate retention is viewed as an efficient form of knowledge transfer, particularly in high-tech industry development. Attempts to measure the benefits of this form of knowledge transfer in local labour markets remain limited. This is surprising given the commonly held view that a region's economic development is directly influenced by higher education's improvement to the quality of labour stock. However, it has been observed that indicators such as retention and attraction rates of trained and educated people, which might act as a measure of the impact of the investment into HE, are often ignored (OECDa, 1999; Thanki, 1999). As such, little is yet known about the flow of students through higher education and into local labour markets (OECD 1999a). This is felt to be a significant shortcoming given the centrality prescribed to skills within the KE thesis and in most devolved authority's policy rhetoric. Moreover, the continued *massification* of higher education and resultantly, the increasing concerns over the impact of this trend (on labour markets and on the individual's experience within them) would also suggest that it is an opportune moment in which to follow this line of enquiry.

The contention that organisations are becoming more knowledge intensive and therefore require a more highly skilled workforce has, in effect, become an accepted norm. In contrast, Ackroyd and Procter (1998) suggest that the reality in much of the service sector and in parts of manufacturing, is a largely *Taylorist* model of production. Rather than having a work-force of knowledge workers producing high-spec, customised goods and services, many organisations have been shown to continue to need workers to perform narrowly specified, closely supervised, repetitive tasks (Beynon et al, 2002; Capelli et al, 1997; Dench et al,1998; Grimshaw et al, 2002; Patterson and West, 1998; Thompson and Warhurst, 1998). As such, rather than a proliferation of

[8] Peck and McGuinness (2003) suggest that the RDA's budget for the promotion of scientific excellence is limited and that this presents difficulties in writing effective innovation strategies. There has also been considerable criticism of the cluster approach to innovation policy and regional development which has been said to increase duplication of efforts and the alienation of existing industries within regions whilst remaining centrally controlled (Gordon and McCann 2000; Raines, 2002)

autonomous knowledge workers, there is counter evidence of greater work intensification under the guise of *multi-tasking*, higher levels of monitoring and the codification of procedures previously requiring *tacit* knowledge. As a result, the jobs in the knowledge economy could be interpreted as being worse than those of the *Fordist* mass-production line, increasing levels of stress and illness (Burchell et al, 2002; Fevre, 2003; Sennet, 1998). Increasingly, there is also evidence relating to the off-shoring of functions previously considered to be skill intensive, and therefore, place-specific (Brown and Hesketh, 2004). Clearly, the narrative relating to the development of a high-skills economy is fraught with contradictory evidence.

The shift from low-skills to high-skills as conceptualised by the KE thesis has also propagated a belief that more education automatically leads to higher economic growth. This has had a pervasive influence across the developed and developing world. Jones (1998 pp 278) has remarked that national levels of educational attainment are treated as if they were a 'coveted virility symbol among national political elites'. The OECD is a significant proponent of the link between education and growth. For example, the OECD's 2002 volume of comparative indicators 'Education at a Glance' discusses the relationship between education and growth in direct and linear terms. There are convincing arguments that such conclusions are imprecise. For example, Wolf (2002) draws attention to the fact that some countries within the OECD have amongst the lowest university participation rates and yet do not have the lowest GNP. Thus the evidence to substantiate a clear linear relationship between education and national income remains unclear. It is equally plausible to argue that in fact, education follows on from growth rather than visa versa. A related point to this is the argument proposing that university graduates earn a higher income premium throughout their lifetime. This has been the stance adopted by the Department of Education in their bid to justify personal investments into higher education. Moreover, this is interpreted as a virtuous cycle in which the graduate income premium is equated with higher earnings which in turn is directly equated with higher tax revenues (NICHE, 1997). The linear relationship between higher education and higher earnings differentials has been shown to be

a tenuous one (Wolf, 2002)[9]. More recently however, a significant discrepancy in this argument has been unveiled. Brown and Hesketh (2004) make the point that the policy discourse on the income returns to higher education is based upon the Annual Graduate Recruiter's (AGR) survey which only represents blue-chip companies (who make up just 5% of employment in the graduate labour market). Given the highly diversified nature of today's graduate population, this is unlikely to present an accurate picture of the employment experience for the majority of graduates in the UK. According to the AGR, graduate vacancies have remained static as graduate numbers continue to grow. In addition, the policy discourse also bases calculations regarding graduate starting salaries on the AGR's survey. In other words, government rhetoric concerning graduate income premiums are based on the earnings of an elite recruitment stream within blue chip companies. The cumulative effect is a gross misrepresentation of the real labour market experiences for the majority of graduates.
Significantly, given the continued emphasis upon widening participation in HE, alternative research has highlighted wide variations in graduate labour market outcomes. In particular, significant variations in earnings have been found to be related to gender, ethnicity and social background (Purcell, 2002). It appears that elements such as these are largely ignored within the drive towards creating a high-skill, high-income economy. Indeed, the KE thesis is criticised for a rationalistic conceptualisation of labour markets (Massey, 1995). As such, the treatment of labour markets in the KE discourse is often criticised for portraying an objective demand for skills met by the unambiguous supply of technical skills thereby failing to recognise a large body of work on the social construct of labour markets and industrial relations (Hodson & Beynon, 2003). As if to highlight this, Markusen (1999, pp. 880) gravely notes that the places celebrated in the KE themed literature (such as Silicon Valley) are 'those with a low incidence of unionisation, relatively polarised occupational structures, hectic and non-community orientated work lives' and with 'chiefly white male hierarchies'.

[9] For example, earnings differentials between graduates and school leavers have been shown to be greater in the UK than they are in other European countries. Following the reasoning as adopted by the Dept of Education, this would suggest that UK graduates are more educated and/or productive than their European counterparts. Clearly this is not the case, the differential is a reflection of the differences in the political approach to income inequality across different countries rather than a direct result of the amount of education received.

The knowledge economy debate also relies heavily on accounts that science / technology or research & development activities are the main areas of employment growth (DfES 2003). It can be argued that this is highly questionable given that some accounts have indicated the opposite to be true i.e. that these sources of employment have been static or declining in many advanced economics (CEC, 1998; DTI, 1998b; Finegold, 1999). In addition, some studies continue to find that a large part of the manufacturing sector do not intend to move into high-skills, high-value sections of production (Keep, 2004). Therefore, critics have argued that it is an exaggeration to conclude that innovation related activities are likely to be the major new source of job creation in cities and/or regions (Brown & Hesketh, 2004). Instead it is argued that the KE is likely to be characterised by limited employment growth and new forms of labour segmentation. In other words, there is a concern that there will be a polarisation in the *opportunity* for people to use their skills in the workplace i.e. underemployment as a result of the oversupply of skills and heightened competition for a limited supply of *knowledge-occupations* (often taken to mean professional and managerial positions). For example, Pryor and Shaffer (2000) criticise the assumption within the KE thesis that an increasing proportion of the workforce will require greater levels of education as a response to the anticipated expansion in knowledge occupations. Instead, the author's analysis of developments in the US labour market between 1970 and 1995 indicated that the supply of educated workers had increased at a faster rate than demand. Paradoxically the study found a faster rate of expansion in employment requiring low levels of educational attainment, and a falling proportion of low-achieving school leavers. The overall effect is said to have resulted in a displacement effect whereby the highly qualified take-up jobs requiring lower educational attainments. Increasingly, concerns are being voiced over this phenomenon in UK labour markets as well (Brynin, 2002). Critics argue that the continued expansion in the supply of graduates has not been matched by an expansion in graduate vacancies and that this may be indicative of a growing incidence of underemployment in the UK (Mason, 2002; Battu and Sloane, 2000). Thus critics argue that the current situation is not only inefficient but that the trend is likely to have negative social impacts given that in situations of

oversupply, recruitment decisions are often based upon irrational and often discriminatory factors (Lovering 1997; Wrench, 2005; Rees & Walters, 2000). This undoubtedly has profound implications if the widening participation agenda and social inclusion issues are to be taken seriously. It also contradicts narratives within the KE thesis which propose that employers must create flexible organisations which tap into the creativity and diversity of employees (Goshal and Bartlett, 2000).

The review of the literature has presented the compelling narrative that is the KE discourse. The consensus view is optimistic and glossy, presenting an inexorable path to high-value, high-income production. However, there exist profound criticisms which highlight the deficiencies within the thesis and which provide, as counter-evidence, a very different picture of the processes involved in the shift towards a high-skills, high value-added economy. Therefore, the KE thesis remains controversial and continues to provide ample mileage for future areas of research. These difficulties aside, the KE debate is often felt to represent a new turn in the UK's approach to industrial, skills and education policy. Moreover, although the treatment of skills within the KE debate has been shown to be problematic, it has located the topic within a wider context. As a result, product-specification and production-strategy and the consequent decisions about work organisation, job design and recruitment are now recognised as important factors contributing to the demand for skills in an economy. Thus, the dominance of supply side interventions such as the national targets for education and training, have increasingly become a point of contention (Wolf, 2002). In effect, the KE discourse has highlighted the need to address issues relating to the factors influencing the *demand* for skills in the UK context. However, policy strategies continue to be articulated in terms of a straightforward requirement to increase the supply of skills in order to meet the requirements of a knowledge economy. For critics, this represents a failure to acknowledge the complex, non-linear relationship between education and growth, and the counter evidence indicating a less optimistic interpretation for future job expansion. Thus the role of skills and higher education in the context of developing towards a KE has emerged as one of the most significant issues in the contemporary period. As a result, this literature review has highlighted the

way in which universities have been adopted as important adjuncts by those advocating the KE stance. Increasingly however, the extent to which universities can generate new business start-ups or work collaboratively to form university-business linkages at a local level is being called into question. As such, the debate has begun to centre upon the extent to which university graduates (often subsumed within the term *talent*) can act as a direct means of embodied knowledge-transfer for local industry and businesses. This strategy is very much in favour amongst devolved authorities and regional development agencies, fulfilling KE themed objectives relating to the anticipated expansion in high-skill occupations and the need to escape a low-skills trap (Finegold, 1999). This approach may also constitute a rational response to the unprecedented increase in graduate numbers which, it is argued, necessitates the acknowledgement of *regional* labour markets as a source of new employers. Therefore, amongst the most recurrent theme in this narrative is the need to *retain* graduates within regional labour markets. This objective is interpreted as a direct means by which managerial and entrepreneurial skills can boost the performance of local businesses and regional economies. As graduate numbers continue to expand, it also represents a potential solution to issues relating to graduate recruitment and successful employment outcomes. As such, ever greater emphasis is placed upon the positive regional return of graduates remaining within local labour markets. However, even in the aftermath of unprecedented increases in university participation rates, very little is known about the flow of graduates into regional labour markets and their experiences within them. This is an area which has been shown to be both under-researched and increasingly controversial given the concerns over graduate underemployment and the shifting burden of tuition fees towards the private individual.

2.5 Summary of the Literature Review.

The literature review began by presenting the consensus view for the knowledge-based economy. This acknowledged many complex inter-related global phenomenon such as de-industrialisation, new forms of organisational structures, new forms of economic co-operation & competition and new sources of value, all of which are used to mark the dawn of a new economic paradigm.

At the turn of the century in particular, the KE thesis became one of the most influential and raved about concepts in economic thinking. In the contemporary period, it has been widely adopted by numerous opinion shapers, becoming capitalism's new 'stable rhetorical form' (Thrift, 2001). Resultantly, the concept appears to have become universally applicable to nearly all fields of economic activity. As such, in the contemporary period, it remains difficult (if not more so) to form a concrete definition for the knowledge-based economy. This is partly reflected by the broadly based approach to the literature review. The review identifies education and skills as a key issue within the KE debate. It is contended that there has emerged a new conventional wisdom in which a highly skilled labour force is considered to be *the* key driver of growth in the contemporary knowledge-based economy. Furthermore, the review identifies the newly strategic role created for universities within this context.

The initial section of the literature review documented how, as a result of global economic restructuring, the KE thesis makes the proposition that high-wage economies must compete in the high-skill, high-value added sections of production in order to maintain competitive advantage and satisfactory levels of income. In turn the high-value sections of the production chain are viewed to be dependent upon the processing and manipulation of *knowledge* and *information* rather than physical resources. This reasoning emphasises knowledge (characterised as un-replicable and embedded within working, institutional and social practices) as the most important factor of production in the contemporary period. The literature review observes that much of the evidence for this reasoning is based upon the observation of small, high-tech firms in a limited number of growth sectors, most notably recorded by Saxenian (1994) in her seminal study into the relationships amongst firms located in California's 'silicon valley'. This it is remarked upon, has mobilised *place* as an economic asset, appearing to offer a proactive stance for endogenous development in a climate of heightened global competition and mobile flows of capital.

The conclusion from the initial, broadly based examination of the KE thesis is that it presents a future of unprecedented opportunity in which competitive advantage depends upon knowledge, innovation and the intellectual capital of a

highly skilled workforce. Section 2.2 of the review considers the emphasis upon the role of skills within the KE narrative. Amongst the phenomenon purported as evidence for the ever increasing demand for higher-skill levels in contemporary labour markets are: the changing nature of employment; production towards high specification goods in which value-added is derived from information and knowledge rather than raw materials; and the up-skilling effects of technology. Other narratives such as flatter organisational structures and the changing nature and complexity of managerial roles are also used to corroborate the requirement for universal up-skilling. Consequently, the review concurs that one of the most pervasive narratives within the KE thesis is the imperative to ensure that the workforce is *employable* or skilled enough to capture an expected expansion in high-skill, knowledge occupations. Furthermore, the review identifies the higher education sector as an important means of delivery for this as well as other economic and social objectives, many of which make recourse to the knowledge-economy for validation.

The reorienting of university activity within the concept of a knowledge-based economy is explored in section 2.3 of the literature review, particularly in terms of the *third-role* agenda. This represents the increasing pressure upon universities, particularly from regional development agencies, to meet localised economic and social objectives. This represents a change in the characterisation of universities away from autonomous institutions traditionally concerned with national or international allegiances and the creation of knowledge for its own sake. Instead, universities are under increasing pressure to commercialise their output and to find new ways of combining their efforts alongside the needs of regional businesses and industry. Besides the third-role agenda, acknowledgement is made of the other numerous and widespread positive externalities from university activity. These are noted for having been largely overlooked within the literature. In particular, it is contended that the experience of graduates entering local labour markets has emerged as a significantly under-researched topic. This is surprising not least in light of the continued expansion in graduate numbers, but also due to the heightened political emphasis upon the role of graduates or 'talent' in embodied knowledge-transfer and in fostering economic competitiveness amongst local businesses. At the time of writing and

given that the principle point at the heart of the KE thesis is the shift from a low-skill, to a high-skills economy; this is highlighted as a significant shortcoming.

Finally, section 2.4 in the literature review considers the alternative readings for the knowledge-based economy. This section acknowledges a number of theoretical, epistemological and methodological weaknesses. Markusen's (1999) polemical stance towards the KE thesis perhaps remains the most prominent, highlighting the misconception over the drivers of change. The selective evidence based upon a narrow set of industries, it is argued, has led to a poorly defined concept which obscures causal relationships. As such, it is cautioned, the impact of policies based upon the KE thesis may be limited and may be susceptible to those harbouring vested interests. Others have highlighted the narrow perspective within the KE thesis which often disregards macroeconomic issues, trade and investment policies and the decline in profits and re-distributive policies (Brenner, 1998; Lovering 1999). Other critics have highlighted the continued presence of a largely taylorised model of employment and production as counterevidence to the skill-intensive model of production so characteristic of the KE thesis (Ackroyd and Procter, 1998; Beynon et al 2002). Some author even suggest that the quality of employment in the KE, involving greater work intensification and heightened levels of monitoring, may be worse than those of the Fordist mass production line (Burchell et al 2002; Fevre, 2003). The place-specificity of skill-intensive sections of the production chain is also being called into question as some commentators point to the off-shoring of functions previously considered non-transferable (Brown & Hesketh, 2004). Others cast doubt upon the extent to which innovation related activities are really going to be the largest new source of job creation (Keep, 2004; Brown & Hesketh, 2004). The alternative reading for the knowledge-based economy is much less optimistic than the consensus view which has, by and large, been adopted by government and development agencies. The two sides of the debate appear to remain largely unresolved with starkly divergent evidence for the causes and processes of economic change.

The literature review indicates that the KE thesis is also problematic in its treatment of skills and education. This is particularly the case when considering

the conceptualisation for economically useful skills in the KE i.e. often conflating technical skills with softer interpersonal skills. Furthermore, the linear relationships between levels of education and economic growth, as often depicted within much of the KE literature, is felt to be a tenuous one (Wolf, 2002); as is the link between levels of higher education and future income e.g. the graduate premium. None the less, the consensus view remains convinced that employment growth will be at the top of the labour market hierarchy and that therefore the demand for highly skilled labour is booming. In light of this, the literature review has shown how the university sector has been repositioned to meet the changing needs of a knowledge based economy. However, the alternative readings for the third role agenda have highlighted deeply entrenched problems which may limit the extent to which universities can function as drivers of growth within their regional economies. There exist now, a clearer understanding of how industrial, institutional, and cultural factors interact in shaping the extent to which universities can participate in their region's development (Doutriaux, 2003; Boucher et al, 2003). As such the extent to which universities can form university-business links and spin-out new, high-technology industries is increasingly coming under scrutiny. Instead, universities are increasingly viewed in terms of their supportive role, particularly in terms of high-tech development through the provision of a highly skilled, graduate population. It is now a commonly held view that a region's economic development is directly influenced by higher education's improvement to the quality of the labour stock. More recently, this has re-emerged using the vocabulary of 'talent' and the need to attract as well as to retain trained and educated people in order to improve a region's stock of managerial and entrepreneurial skills thereby attracting inward investment and creating the conditions for endogenous growth (Florida, 2002; Michaels et al 2001). Universities are increasingly viewed as key institutions within this context. Although there has been widespread adoption of this reasoning particularly amongst those involved in regional development, the literature review draws attention to the paucity of research into this area. Little is known about the flow of graduates into local labour markets and their effect upon productivity / competitiveness. This is felt to be a significant shortcoming given the centrality placed upon the role of highly skilled labour, especially graduates,

within the KE thesis. Moreover, the literature review points to the continued expansion in graduate numbers and concerns over tuition fees and underemployment as adding to the salience of this particular line of enquiry.

Thus the literature review identifies the strategic importance placed upon skills within the KE thesis. As a result, the review posits that there has emerged a new conventional wisdom in which a skilled labour force is considered to be the most important factor for production in a knowledge based economy. Increasingly, universities have been adopted as important adjuncts in meeting these new demands. However, the literature review has indicated that there is little research into the experience of graduates in local labour markets across the UK. As such, the remainder of this thesis attempts to contribute towards lessening this paucity of research. It will consider how well placed different regions across the UK are, in terms of the stock of graduate skills in the local labour force. In doing so, the thesis will consider the labour market experience for graduates in different regions and cities across the UK, with the aim of identifying whether or not the experience of graduates in local labour markets reflects labour market expansion as posited by the KE thesis.

Chapter 3. Research Aims & Objectives.

The research questions can now be considered in light of the literature review. The previous chapter presented the wide breadth of inter-related and highly complex global phenomenon and processes which are considered to be representative of the knowledge-based economy. The review also highlighted the continued debate over the theoretical, epistemological and empirical reasoning within the KE thesis, drawing attention to the possible misconception over causality, structure and agency as well as selectively chosen evidence. As such, many aspects of the KE thesis continue to be multi-faceted and somewhat inconclusive, providing ample mileage for further areas of research and inquiry. Nonetheless, the literature review makes the case that one of the defining (and influential) principles within the KE thesis is the role played by human capital (e.g. the ubiquitous *knowledge-worker* or *talent*) in fostering competitiveness and economic growth. Notwithstanding the definitional problems associated with the conceptualisation for economically useful skills within the KE thesis (as discussed in the preceding chapter), the role of the 'knowledge-worker' or 'talent' has captured the popular imagination of contemporary opinion shapers, government and regional development agencies. In addition, contemporary theories of growth often stress the role played by educational investments in increasing the pace of economic development (NCIHE 1997) and the supply of graduates has come to be seen as synonymous with the supply of skills. Increasingly, the latter is also considered to be a direct means by which the higher education sector can contribute towards *knowledge-transfer* and the development of the regional skills base (OECD 1999a). Thus, the literature review highlighted an emerging conventional wisdom which states that highly skilled labour (often defined as graduates) are a, if not the, key driver of growth in the contemporary *knowledge-based* economy. The consensus view also states that employment expansion will be at the top of the labour market hierarchy and therefore, that the demand for skilled labour is booming (DTI 1998a). In addition, the review demonstrated how the higher education sector has been adopted within this context. This is considered to be a new development, one that has witnessed the re-orientation of universities in light of the KE thesis. In other words, there has been a burgeoning of strategies related

to the role of universities in their region's economic and/or social development. i.e. the *third-role* agenda. The bases for these demands are felt to arise from the structural changes as posited by the KE thesis. However, the extent to which heightened competition and funding pressures are the greater impetus, continues to be a moot point.

Aside from the emergent *third-role* agenda, whereby university output is manoeuvred towards explicitly economic and/or social objectives, the literature review also highlighted the numerous wide-ranging positive externalities which can emerge from university activity. Many of these remain largely un-documented and it remains beyond the scope and means of this thesis to consider any in great depth. Instead, the review placed particular emphasis upon the third-role agenda given that it unambiguously articulates itself using the language of the KE thesis. Having considered the third role agenda in terms of the commercialisation of university activity, the review highlighted the increasing limitations of this approach to regional development. In other words, there is a greater understanding about the distinctive nature of higher education and the barriers which are likely to inhibit greater regional interaction (e.g. the prevalent culture within universities; competition amongst institutions; the existing industrial base and the funding structure for third role activity). As such, there is growing pragmatism over the extent to which universities can function as the 'engine of growth' or 'seedbed' for new industries as much of the KE rhetoric would proclaim (DTI / DfEE, 2001, 3.13). Instead, for the majority of universities, their role is increasingly viewed as a supportive one. In other words, they are increasingly characterised as providing local businesses and existing industry with access to specialised skills in the form of the graduate and postgraduate population as well as academic consultancy services (Doutriaux, 2003; Piccaluga & Lazzeroni, 2003). More recently, universities have been manoeuvred towards ensuring the 'employability' of the local labour force in order to meet employment expansion as posited by the KE thesis (OBrien and Hart, 1999; Morley, 2001; DTI/DfEE, 2001; DfES, 2003; SHEFC, 2004). The regionalisation agenda also persuades universities to consider local firms in the immediately surrounding region as potential recruiters for their growing graduate population. Likewise, small and medium sized companies

who are not traditionally part of the graduate recruitment *milk-round*, are also being given incentives to consider employing 'thinkers'. It would appear that the continued expansion in higher education combined with funding pressures has inevitably resulted in calls for greater regionalisation of university activity, including the design of academic curricula and employment outcomes for graduates (OECD, 1999a). Furthermore there is a perception amongst those concerned with regional economic development that universities may function as a means to attract and retain highly skilled labour from beyond the immediate city and region. For example, the OECD (1999a, pp. 62) has stated that 'graduate retention is an important mechanism through which a region can retain people with innovative, entrepreneurial and management capabilities'. Clearly, the role of a skilled population has come to be seen as one of the most important elements in the creation of a competitive regional economy. Graduate retention is felt to be of greatest pertinence to the 'lagging regions' that tend to lose graduates to more prosperous cities and regions (OECD, 1999a). In Scotland, this is a theme widely publicised in the calls to 'persuade more young graduates, wherever they originate from, to stay' (Scottish Executive, 2000). Therefore, one of the key priorities set out by the Scottish executive's Framework for Economic development (Scottish Executive, 2000) is simply to encourage more people to live and work in Scotland. The Framework for Economic Development also highlighted the loss of graduates from Scottish Universities with particular emphasis placed upon those with Maths and Computer Science degrees. This has been identified as potentially detrimental to Scotland's vision for a high-tech, high-skills, knowledge-based economy.

The preceding chapter highlighted a new conventional wisdom which emphasises the strategic importance of a highly skilled labour force for economic growth in the knowledge-based economy. Universities are shown to have been adopted as important adjuncts in meeting this and other economic/social objectives. An important corollary to this was the observation that there is an increasing emphasis upon the need to regionalise university activity including employment outcomes for graduates. Given the widespread adoption of this new conventional wisdom, it would appear that universities are well distributed across the UK in order to attract, develop and retain human

capital for the benefit of regional economies. However, the review also reflected upon the paucity of research in this area. As yet, very little is known about how graduates are absorbed into labour markets, especially *local* or *regional* ones. This represents a significant shortcoming given the contemporary period's emphasis upon attracting and retaining 'talent' within urban and regional economies. In the UK, the concern is that skilled individuals are often drawn to the south-east, thereby creating a *brain-drain* from the north of England and from Scotland. In this context, the investments that are made towards higher education institutions located within peripheral areas do not have a complete regional return in terms of the retention of skilled labour (a primary focus for those agencies concerned with the economic contribution of HEIs to their locality). Hence, the issue of graduate retention has begun to feature prominently in regional development initiatives. In addition, the continued expansion of graduate numbers, concerns over differentiated returns from investments into higher education and graduate under-employment, would appear to make this line of inquiry an especially pertinent one. Hence, the aim of this thesis is to consider how well placed regions and the cities within them are, in terms of graduate retention. This is made all the more significant given the KE's predicted expansion in jobs requiring highly skilled labour (for which holding a university degree is often a proxy), (DfES, 2003). Furthermore, given the emphasis upon the need for regions and cities to attract and retain 'talent' as a means of drawing-in knowledge-based firms and to boost flagging tax revenues, graduate retention can be viewed as an indicator of the regional return to investments into higher education. Additionally, examining the way in which graduates are absorbed into local labour markets is likely to reflect whether or not employment expansion, as posited by the KE thesis, holds true and whether or not *underemployment* is a significant problem for graduates in different places. Finally, considering patterns of graduate origin and final destination will address the emerging concerns over the loss of skilled graduates from periphery towards core economic areas (Scottish Executive, 2000a) and the extent of regionalisation within the UK system of higher education as it stands. In overall terms, in light of popular reasoning as set out by the KE approach to economic development, this thesis will measure levels of graduate retention in regions and cities in order to make some tentative conclusions about the regional return to

investments into higher education within the context of development towards a KE. This thesis will also consider the way in which graduates are absorbed into labour markets in different places and whether or not the experience is reflective of employment expansion as posited by optimistic interpretations for the KE. The flow of graduates into regional labour markets has been highlighted as a prominent topic within the KE debate. Graduate retention is now an important objective amongst devolved governments and regional development authorities. Yet there remains a paucity of research into this area of reasoning.

The initial aim of the thesis is to present a picture for graduate origin and employment destination across three broadly defined UK regions and cities within them (see Appendix B and map on pp.44). From this, levels of graduate retention can be calculated thereby giving an indication for (a) the regional return to investments into higher education which are considered to be high if levels of retention are high and graduates proceed into employment within the region of study; (b) the existence of graduate brain-drain from regions & cities i.e. a net loss in graduates (c) the extent of regionalisation within universities, in terms of graduate origin & destination. Closer examination of graduate characteristics and the way in which they are absorbed into local labour markets (regional and urban) will provide an insight into under-employment from which some tentative conclusions may be drawn about the extent to which employment expansion reflects that of the KE thesis. The labour market role of universities can also be gauged through this analysis. Finally, given the emphasis upon the need to attract and retain graduates in order to maintain regional / urban competitiveness; the thesis aims to consider the motivations amongst graduates when they make relocation choices. In the contemporary period this has emerged as a highly topical issue given the popular view that knowledge workers make their relocation choices upon the basis of place *attractiveness* rather than economic variables alone (Florida, 2000). Furthermore, in Scotland, concerns continue to be voiced over the loss of young 'talent' and the need to stem this outflow and indeed, to encourage more graduates to remain (Scottish Executive, 2000a). The thesis aims to identify the motivations amongst graduates in their decision to remain within their place of study or to relocate elsewhere. A particular distinction will be made between economic motives and

softer, quality of life factors. Unlike economic factors which are difficult to change in the short run, softer quality of life factors are likely to be more amenable to change and policy action. Therefore, the distinction is a pertinent one.

The analysis within this thesis remains largely descriptive (partly as a result of the volume of data) from which some tentative conclusions can be drawn but by and large, the scope of the thesis is limited to highlighting trends in the pattern of graduate retention and employment across broadly defined regions and cities at a particular point in time. The thesis is unable to provide a detailed analysis about the impact or role of graduates on the productivity or competitiveness of local businesses, nor does it reveal the exact nature of regional / urban economies and employment change within them. Neither is the thesis capable of providing a statistical model for the factors which have an effect upon graduate retention. Instead, it explores the relative importance between *economic* and *quality of life factors*, to graduates when they consider employment destinations. The regional analysis is conducted at a high level of aggregation and therefore provides a generalised picture. Therefore, the thesis can be considered as a starting point from which a very large data set relating to graduate origin and destination is re-grouped and transformed into a coherent descriptive pattern. From this initial point observable trends emerge (some of which have potentially serious implications), which in themselves can only point towards a continued need for further research and statistical analysis.

This research sets out to answer five questions:

1. What are the patterns for graduate retention across different parts of the UK?

'In skills enhancement linked to raising regional competitiveness, there should be a place for targeted graduate retention'(OECD 1999, pp107). The OECD's statement on graduate retention stands as a testament to the importance with which this topic is now regarded. Therefore, a necessary initial step is to assess the extent of graduate retention as well as the outflow of graduates from regions and cities within the UK.

Graduate loss (or brain-drain) is most often discussed at a national level and little attention has been given to this process at regional or city level. This is surprising given the widely held view that there is a tendency for graduates to be pulled towards core economic areas and capital cities (OECD ibid). In addition, it is often felt that the quintessential 'knowledge economy' sectors are located within the metropolitan landscape (Graham & Marvin 1995) and indeed, given the optimistic interpretation for the KE, that the demand for knowledge-workers is booming. Add to this the historical location of universities within cities, and it can be argued that alongside a regional scale of analysis, the city is an appropriate geographical scale within which to investigate the processes of brain drain. More generally, cities have become a focus for debate and policy action due to the many economic/social challenges they present to those involved in their regeneration. Attempts to regenerate inner cities through fashionable means such as *gentrification* and *place-marketing* are now widespread and in some ways, the concept of graduate retention fits neatly into this particular approach by fulfilling development agendas which (i) highlight the importance of attracting a young, skilled and highly consumer-oriented strata of society into economically and fiscally depressed city areas (Turok, 2004) and (ii) stress the importance of maintaining a skilled workforce in order to generate endogenous growth and attract inward investment, thereby capturing the expected expansion in knowledge-occupations as predicted within the KE thesis.

2.What are the characteristics of graduates retained within each region / city and their labour market outcomes?

The main purpose of this question is to present a typology for graduates retained within each city/region and to draw conclusions from this. It will also provide room for analysing the diversity of the population amongst cities and regions. The retained graduates will be identified by their activity i.e. whether they were mostly in employment or continuing further study. The former of these two activities is considered to be a direct and productive contribution to the local economy and to local skills, whereas the latter is considered to be of a more indirect and transient benefit to the local economy. In other words, the level of

graduate retention and graduate employment status can be considered as a proxy for the regional return to investments into higher education. In addition to the main activity of retained graduates, the type of occupation and industry in which they were employed is also central to the analysis. This will give some insight into the graduate experience in different areas across the UK. In other words, it will present the 'quality' of employment amongst graduates retained within each region / city, and the extent to which graduates are facing under-employment i.e. graduates in jobs that do not necessarily require graduate skills. From this, some tentative conclusions can be drawn regarding the extent to which graduate employment trends reflect employment expansion as posited by the KE thesis and government predictions (DTI, 1998a; DTI / DfEE, 2001). Finally the type of qualifications held by retained graduates will also be analysed. This will give some indication as to the level and specific type of skills prevalent amongst the graduates retained within cities and regions. The latter point aims to address the concerns over the loss of graduates from particular disciplines (Scottish Executive, 1999 & 2000a).

3. Do regions and cities experience a net loss in graduates with specific skills?

The purpose of this research question is to assess the net-loss in graduates (brain-drain) from regions and cities according to specific characteristics. The examination of brain-drain will be extended to identify whether it occurs mainly amongst postgraduates or first degree graduates; or whether it occurs amongst graduates continuing into employment or those continuing with further study. Additionally, this approach will identify the extent of brain-drain/gain across different types of university and subject areas. The latter is of particular interest at a Scottish level given the heightened interest in skill shortages and the need to arrest graduate out-migration, particularly in subject areas such as computing science, maths and I.T related disciplines i.e. disciplines with arguably the greatest contribution to make to innovative industries and the knowledge economy (Scottish Executive 1999).

4. What role do the universities in each city play in their local labour market?

This question aims to identify the ways in which universities engage with the local labour markets via graduate employment. In other words, to what extent do universities train locals for local jobs? Or are universities a source of additional labour for the city/region i.e. importing people from beyond the city/region who remain in the locality after graduating; or do they essentially service a national demand for skilled labour? Thus the aim is to gauge the existing level of regionalisation within the system of higher education and local labour markets. Current thinking would suggest that the extent of regionalisation between universities, their graduates and local employers is low, hence the calls for universities to reconsider local businesses as a potential pool of graduate employers (OECD, 1999a). In addition, this has a resonance with the contemporary period's enthusiasm for the potential for universities to attract and retain 'talent' for regional competitiveness and to contribute towards the *employability* of the local workforce (DfES, 2003; OECD, 199a; SHEFC, 2004).

The following typology will be used as a descriptive framework to asses the labour market role that the universities within each city play:

- A *local ladder*. In this case, the universities act as a skills enhancing 'ladder' for the local population. The universities train and develop local students, the majority of whom remain within the city for employment.
- A *springboard*. In this case, the universities train local graduates who subsequently leave their origins to work elsewhere.
- A *magnet* to expand the skilled workforce. In this case the universities attract and develop graduates from elsewhere who subsequently remain in the city for employment.
- The *temporary training ground*. In this case, the universities attract and train graduates who subsequently return to their origins or go elsewhere for employment.

It is hypothesised that every university will perform all four roles to a lesser or greater extent. However, the balance between each role is expected to vary between universities. It is also likely that the balance will vary between cities depending on the size, composition and buoyancy of local labour market conditions.

Table 3.1 The typology of universities & their role in the local labour market.

University Typology	**Graduate origin and final destination**
Local Ladder	Local → Local
Spring-board	Local →Elsewhere
Magnet	Elsewhere →Local
Training ground	Elsewhere → Elsewhere

n.b. Local ladder + Spring-board = 100% of local origin graduates.
Magnet + Training Ground = 100% of external origin graduates.

Out of the four typologies, the most 'positive' economic function is the *magnet.* In this case the university is a route through which additional skilled labour enters the local labour market. This is significant given the increasing desire of cities to compete for a skilled and mobile population (Turok et al 2003; Florida 2002) which is perceived to be important for the enrichment of the labour supply and to replace out-migration and increase city revenues (through consumption of goods & services as well as taxes).

The university as a 'local ladder' performs a valuable function in that it is a mechanism for increasing skill-levels amongst a local population. However, it does not bring additional labour or spending power into localities. The university as a 'temporary training ground' is valuable since it functions as a temporary

stimulus to the local economy though the injection of the non-local student's spending power into the local economy. In addition, these students may also function as a temporary workforce while taking up part time employment during their studies. However, the 'training ground' effect is temporary and therefore has limited long-term effect upon the locality. Finally, the university as a 'springboard' for local graduates is perhaps the least positive since it is a route through which their potential contribution to the locality is lost. It is arguably negative if the people concerned would not otherwise have left the city.

Hence, the research aims to shed light on the extent to which groups of universities in different places perform these different roles. It must be borne in mind that this typology ignores many of the more subtle, intangible and dynamic effects of graduate flows into and out of universities and cities, including learning from different cultures, improving the reputation and ultimate quality of the university, and gains from long term alumni connections. For instance, the 'springboard' function may prove to be of long-term benefit if the people concerned acquire valuable skills, experience and financial resources which they then return to their home base later on in their working lives.

1. What factors influence graduates when deciding where to work?

This question aims to consider the factors which have an effect on the decision of graduates to remain or leave the city in which they had studied. Therefore the aim is to find out what motivates graduates to locate in particular places. Are the factors mainly related to employment and labour market issues (factors that may be difficult to adjust, at least in the short term), the quality of life in particular cities (factors that can be more amenable to adjustment) or the pull of family and social ties? For example, do cities with economic problems still retain graduates because of their quality of life and low cost of living? The object is to identify the relative importance of each factor and to consider the extent to which cities and the universities within them, can really function as a means of attracting, developing and retaining *talent* as some commentators envisage.

Chapter 4. Data Sources and Methodology

Initially, the basis for answering all five research questions was the selection of a sample of cities with consistent geographical boundaries; the selection of Higher Education Institutions within each city; and the selection of an appropriate timescale for which data was to be examined. The following chapter considers the data sources that were used, their strengths and limitations as well as the methodological approach to each research question.

Data from the Higher Education Statistics Agency

Data employed in the analysis of graduate brain drain was provided by the Higher Education Statistics Agency (HESA). HESA collates the data from the annual graduate's 'First Destinations' survey. The data used for the purpose of this research spans three cohorts of graduates from the years 1997/98, 1998/99 and 1999/00. The data is differentiated by: the institution attended (see appendix C) , whether the qualification obtained was a first degree or postgraduate degree (see appendix E) , the subject studied (see appendix F), graduate domicile and destination (appendix B) , employment status (see appendix D), standard industrial classification and standard occupational classification (see appendices H & G respectively). The HESA data provides a four digit standard occupational classification (SOC) and standard industrial classification (SIC 1992) for employment. Employment is further classified as full time, part time, permanent or temporary. At the same time the HESA survey collects postcode details for graduate domicile, higher education institution attended, and first workplace locations for each graduate. For the purposes of this research, these were initially grouped into unitary authority districts and after undergoing some manipulation, were subsequently transformed into cities and regions (see appendix B). The data thus permits the identification of graduate flows from place of origin to place of study and then to place of employment.

The cities selected for analysis are: Greater London, Greater Glasgow, Aberdeen, Greater Edinburgh, Dundee, Greater Manchester, Merseyside, West Yorkshire and Tyne & Wear. The definition for these cities followed the methodology used in Turok & Edge (1999). Table 4.1 gives the definitions used

for each of the cities selected for analysis. The cities selected represent all the major cities and conurbations in England and Scotland. In addition, these cities have been selected in order to make a distinction between the 'northern' cities and Greater London. Thus, the selection of cities provides sufficient contrast between core and periphery as well as economically successful cities and those which have had a history of industrial decline. In particular, the cities of Glasgow, Manchester, Merseyside and Tyne & Wear have been specifically selected due to their history of industrial decline and poor economic performances (at least until the last few years). Edinburgh and West Yorkshire have been selected due to their stronger economic performance over recent years. The additional Scottish cities of Dundee and Aberdeen are included in order to provide a greater understanding of graduate movements throughout Scotland and, on account of their relative geographic isolation, as a contrast to more central areas. Finally Greater London was selected as a contrast to all of these cities, both in its size and economic performance.

Table 4.1 Geographical definitions for cities used in the analysis.

City		Unitary Authorities
G.London:	G.London	City of London, City of Westminster, Tower Hamlets, Greenwich, Lewisham, Southwark, Lambeth, Wandsworth, Islington, Bexley, Richmond upon Thames, Kingston upon Thames, Haringey, Waltham Forest, Redbridge, Camden, Hackney, Newham, Barking & Dagenham, Hammersmith & Fulham, Kensington & Chelsea, Havering, Bromley, Croydon, Sutton, Merton, Hounslow, Hillingdon, Harrow, Ealing, Brent, Barnet, Enfield.
Scotland:	G.Glasgow	City of Glasgow, East & West Dunbartonshire, Renfrewshire, East Renfrewshire, Inverclyde, North & South Lanarkshire.
	Aberdeen	City of Aberdeen, Aberdeenshire
	G.Edinburgh	City of Edinburgh, East Lothian, Midlothian, West Lothian.
	Dundee	City of Dundee, Angus, Perth & Kinross.
North of England:	G.Manchester	City of Manchester, Rochdale, Oldham, Tameside, Stockport, Trafford, Salford, Bolton, Bury.
	Merseyside	Liverpool, Knowsley, Sefton, St Helens.
	W. Yorkshire	Leeds, Wakefield, Kirklees, Bradford.
	Tyne & Wear	Newcastle, North & South Tyneside, Sunderland, Gateshead.

In addition, a definition for the wider region in which the 'city' is located, was also felt necessary since many universities draw the bulk of their students from the wider region beyond the conurbation, and not necessarily from the nation as a whole. Hence the analysis was conducted at three spatial scales: city, broad region and nation. Appendix B present the precise geographic definitions used for 'Scotland', 'the South of England' and the 'north of England' as a list of grouped local authorities. The three broad 'regions' are also presented in the map overleaf.


Scotland
Northern England
Southern England
0
50
100 km
Boundaries revised to April 2001

Each of these 'regions' have been defined primarily on the basis of equivalent size and a perceived common identity. However, there are grounds to argue that the high level of aggregation limits the extent to which any firm conclusions can be drawn about labour market trends within each region. In hindsight, further regional disaggregating may have been useful, especially if an analysis of labour market trends were an explicit objective of the analysis. Instead, the primary focus of the analysis was to measure graduate retention and issues related to a brain-drain from northern Britain towards the south. As such, since the analysis was not extended to consider labour market trends in each region, it is felt that this is sufficient ground on which to qualify the broadly based approach.

The selection of higher education institutions (HEIs) was based upon the cities chosen for analysis. Hence all the universities located in the cities of London, Glasgow, Aberdeen, Edinburgh, Dundee, Manchester, Liverpool, Leeds and Tyne & Wear were selected (see appendix C)

HESA is the only centralised source for higher education statistics and this represents a major advantage in sourcing the required data. None the less, there are some limitations worth pointing out. HESA collects data from each HEI in the UK by means of an annual survey of graduates called the "First Destinations Survey" (FDS). The data collected is wide ranging. The main disadvantage concerning the data is the time period during which it is collected. In other words, the data concerning any given graduate is collected six months after graduation. Given that many graduates are still at a transition stage, either still in search of employment/further study or some other activity, the data does not capture the long term destination for graduates. In other words, the data more accurately captures graduate movements and career choices in the short term rather than the long term.

In addition, the collection of data at postcode level only commenced from 1995/96 onwards. Hence many aspects of the analysis is influenced by this factor which remains beyond the author's control. Resultantly, the length of the time series was necessarily short. In turn, this limited the flexibility and range of the analysis. For example, a longer timescale from which data could be collected

would have enabled the grouping of data into a sequence of shorter time-series enabling a correlation study with corresponding labour market data for each city / region. In addition, post code level data for the years 1995/96 and 1996/97 were found to have a high proportion of unknown entries with some universities having failed to collect data at post code level. In light of this, analysis at city level could only be carried out using data from 1997/98 onward. For this reason, only the data sets from the years 1997/98, 1998/99 and 1999/00 could be selected for analysis. Thus, the length of the time series was restricted by factors such as the commencement of data collection at postcode level by HESA and the subsequent omissions. The three years of data were added together to increase the number of observations and reliability. In addition, the University of Strathclyde was excluded from the data analysis for Glasgow city due to the fact that this institution did not collect data at post code level during the time period selected.

The most significant modification applied to the data was the omission of entries for which data was incomplete or unavailable. Additionally, students and graduates of foreign origin were omitted from the analysis on account of the high proportion that returned to their home country. In light of the recent interest in the potential for foreign graduates from Scottish universities to plug the region's skills gap (e.g. Scottish Executive, 2000a); their omission may have unnecessarily restricted the potential scope for the analysis.

Table 4.2 .Graduate numbers and the effect of removing unknown entries.

City in which HEIs are Located		A Total Graduates (unknowns inc.)	B Total Graduates (unknowns excl.)	C Unknowns (as a % of A)
England:	G.London	68494	54187	14307 (21%)
Scotland:	G.Glasgow	14414	11323	3091 (21%)
	Aberdeen	7319	6385	934 (13%)
	G.Edinburgh	14967	13920	1047 (7%)
	Dundee	4656	4147	509 (11%)
North of England:	G.Manchester	27437	20605	6832 (25%)
	Merseyside	15528	13548	1980 (13%)
	West Yorkshire	17807	16182	1625 (9%)
	Tyne & Wear	17942	16931	1011 (6%)

The overall effect of the omissions was to reduce the population size for entries from HEIs in each city. The reduction varied across cities. Table 4.2 details the number of graduates qualifying from HEIs located in each city, with and without the unknown entries. Column A lists a total count of all the data. The second column in the table presents the count excluding all incomplete entries. The final column quantifies the incomplete entries in absolute and in proportion to the total number of data entries.

The cities which had a particularly high level of unknown or incomplete entries were London, Glasgow and Manchester (up to 25%). This was followed by Aberdeen, Merseyside and Dundee (just over 10%) The remaining cities, Edinburgh West Yorkshire and Tyne & Wear, had the lowest proportion of unknown entries (under 10% in each case).

The postal survey of graduates.

A postal survey of graduates from a cross section of Scottish universities was conducted with the co-operation of the Alumni departments at each institution. Appendix C gives full details about the universities involved and an example of the questionnaire used is presented in appendix I. In the period between January and March 2001, nine hundred questionnaires were sent out to graduates who had qualified between the years 1995 and 2000. This time scale was chosen in order to gain an insight into the migration patterns of graduates over a longer timescale. Apart from the setting of this time scale, the graduates were randomly selected from the Alumni database at each university. A 31% response rate was achieved. On account of the low response rate, the sample size from the graduate survey is small and therefore any conclusions that are to be drawn may not be wholly representative.

The questionnaire specifically addresses the motives behind the graduate's move from their place of study to their place of employment. For non-recent graduates who have had more than one job, the questionnaire requested information about the motives which influenced each major geographical relocation.

The postal survey in conjunction with assistance from Alumni departments represents a unique approach to gathering information from graduates. The main benefit of this approach is that it enabled information to be gathered from graduates who had been in employment for a longer time period (as opposed to the First Destinations Survey which captures the activities of graduates only six months after graduating). As with all postal questionnaires, there are drawbacks too. Response rates tend to be low and there are potential problems with the interpretation of questions. However, it was felt that the target population (i.e. graduates) are sufficiently motivated and literate to enable the successful implementation of a postal survey. The low response rate to the postal survey and consequently, the small sample size can be considered as a limitation and as such, the conclusions from the analysis are tentative ones. The response rate could have been increased by a pilot study and follow-up letters, but this was not pursued given the complexity with which addresses had to be obtained from the Alumni offices and the amount of labour time involved. In other words, due to restrictions imposed by the data protection act, addresses were not disclosed to the author of this research. Instead, members of staff at Alumni departments acquired an intermediary role, becoming responsible for the selection of graduates, their addresses and the final labelling and posting of questionnaires (as instructed and prepared by the author). The inclusion of a pilot study is likely to have improved the accuracy of the survey both in terms of content and the specificity of the information gathered. In addition, the random selection of graduates may also have proved to have restricted the analysis by reducing the specificity of the information gathered.

The methodological approach to the research questions.

The analysis within this thesis remains largely descriptive as a result of the large volume and complexity of data. As such, complex statistical analyses, tests of variance and significance are omitted. It is felt that manipulating the data in the most transparent way would enable an efficient, descriptive exploration of the data. In other words, it would let the facts speak for themselves especially in light of the fact that the data had not been previously used in this context (this is especially true of the manipulation of the data according to urban boundaries).

As such, the scope of the thesis is limited to highlighting trends in the pattern of graduate retention and employment across broadly defined regions and cities at a particular point in time. The thesis is unable to provide a detailed analysis about the impact or role of graduates on the productivity or competitiveness of local businesses, nor does it reveal the exact nature of regional / urban economics and employment change within them. Neither is the thesis capable of providing a statistical model for the factors which have an effect upon graduate retention. Instead, the thesis can be considered as a starting point from which a very large data set relating to graduate origin and destination is re-grouped and transformed into a coherent descriptive pattern. Its value lies in the observable trends which emerge from the descriptive analysis (some of which have potentially serious implications) and which in themselves can only point towards a continued need for further research and statistical analysis.
The methodological approach to each research question can now be considered.

Q1.What are the patterns for graduate retention across different parts of the UK?
The initial purpose of this question is to gauge the regional return of private and public investments into higher education in terms of graduate retention. In addition, the analysis of graduate retention in regions / cities will enable commentary to be made upon how well placed the UK is, in terms of meeting the expansion in knowledge-occupations as predicted within the KE narrative. The initial findings will also provide an indication of whether or not there has been a brain drain of graduates from peripheral regions (i.e. Scotland and the North of England) to the South of England. Additionally it also examines the extent of brain-gain in a core economic region such as Greater London and Southern England. Therefore, by examining the origin of graduates flowing into each of the broadly defined regions (Scotland, the North of England and the South of England) and the subsequent destination of graduates who had studied in each of these regions, a broad pattern for graduate movements emerges. Thus the issue of graduate retention and brain drain from peripheral regions will be addressed at this preliminary stage.

The focus of the analysis then turns to examine graduate retention and brain drain at city level. Using the pre-selected sample of cities, the following are examined: (i)whether or not a disproportionate number of graduates left the city in which they had studied overall, and (ii) whether the number of local-origin graduates that left was greater than the number of non-local graduates who remained. Thus, the former of the two presents graduate retention loss in gross terms and ignores the origin of graduates. The latter takes graduate origin into account and presents a net figure i.e. brain drain or brain gain.

Firstly, a straightforward numerical account for the total number of graduates qualifying from each city was carried out. This was differentiated by graduate origin. This in turn identified whether the graduates qualifying from each city were predominantly 'local' or 'non-local' in origin. The numerical account presents the total number of graduates that were retained in each city. The total number of graduates retained within each city gives the figure for overall gross retention. This identified whether or not cities retained the majority of all their graduates within their boundaries. However, gross retention fails to consider the graduate-origin profile for each city and in this sense provides a limited view into the pattern of graduate inflows and outflows for each city. For example, cities with a very high proportion of local-origin graduates are very likely to experience a high level of gross retention whereas, cities in which the graduate population is largely non-local are more likely to experience a disproportionate out-migration of graduates overall as non-local graduates return to their place of origin (in other words graduate origin is likely to affect graduate retention). This phenomenon is surprisingly ignored in some high profile analyses of the brain-drain/gain issue (e.g. DTI, 2001). Therefore, considering gross retention in proportion to the number of local-origin graduates within each city provides a clearer analysis of brain-gain/drain within each city. The analysis into brain gain/drain captured the net effect of *local-origin* graduates that left and the *non-local* graduates that remained in each city. If the number of local-origin graduates, who left exceed the number of non-local origin graduates who remained, then a brain-drain had occurred. If the opposite is true, then a brain-gain had occurred.

Q2. What are the characteristics of graduates retained within each region / city and their labour market outcomes?

The approach to this research question involved the simple identification of graduates, retained within each city, by the activity in which they were engaged in (employment vs. further study); the occupation and industry in which they were employed; their level of qualification (first degree vs. postgraduate degree) and the subject in which they had specialised. An important outcome of this analysis is an assessment of the extent to which graduates face under-employment in different cities and regions across the UK.

Q3. Do regions and cities experience a net loss in graduates with specific skills?

Once again the approach to this question is similar to that followed in response to Q1. The analysis of brain gain/drain was carried out on different groups of graduates that had studied in each region / city. In other words, the net effect for the outflow in local-origin graduates and the retention of non-local graduates as calculated separately for graduates who were employed/in further study, for graduates with first degrees and for graduates with postgraduate qualifications and finally, for graduates in different subject areas. The overall outcome of the analysis, as detailed above, is a set of descriptive key indicators identifying specific areas in which graduate brain-drain may present a problem. The key indicators also enable a comparison to be made between regions & cities.

Q 4. What role do the universities in each city play in their local labour market?

The aim of this question is to describe universities in terms of a typology of functions (as described in the section on aims & objectives). The typology listed the possible functions of HEIs within their local labour markets as either (a) *local ladders*, training a local population that remains within the city for employment (b) *Springboards*, training local graduates who then left for employment elsewhere (c) *Employment magnets* which attract students from elsewhere and who subsequently remain in the city and (d) *temporary training grounds,* that simply train a non local population of graduates who subsequently return to their origins.

The approach to answering this question involved the analysis of data relating to graduates that were in employment only. For each city, the retention level among local-origin graduates and non-local origin graduates was calculated separately. This explained the extent to which graduates from each origin group were attracted to remain in the city in which they studied or whether instead, they were more likely to move on elsewhere. In turn, this allowed for cities and the HEIs located within them to be classified according to the typology described earlier.

The exercise was repeated but with differentiating variables as described earlier. These are: the type of degree held, the subject studied and the type of university attended.

Q5. What factors influence graduates when deciding where to work?

The approach to answering this question was largely qualitative in nature. The approach consisted of analysing the qualitative data collected from a postal survey of randomly selected graduates (as described earlier in this chapter in the section devoted to the postal survey of graduates, pp. 46). An example of the questionnaire can be found in Appendix I together with an explanation of the way in which the data was grouped to represent three categories of motivations.. The main objective is to ascertain whether *economic* motives are more important than softer, *quality of life* factors (or visa versa) when making decisions about where to live and work. This is particularly significant in the contemporary period given the newfound importance that is increasingly placed upon the latter within the context of the migration choices made by highly skilled and affluent 'knowledge workers' (see Florida, 2001).

Chapter 5. The Regional Pattern of Graduate Migration.

Introduction

Chapter 5 begins with an overview for the graduate flows into and out of higher education institutions (HEIs) located in Scotland, the north of England and the South of England. Particular attention is given to the movements of graduates from Scotland and the North towards the South of England. Section 5.1of this chapter investigates the origin and the employment destination for graduates who had studied in each region. This enables a characterisation for each region in terms of student recruitment and graduate retention patterns. This also provides a preliminary indication of any brain-drain or brain-gain from/to these regions.

Section 5.2 considers the overall *gross* retention of graduates in each region. This section also describes the characteristics of those graduates retained within each region. Graduates retained in each region are compared by: the level of qualification held; the subjects in which they had specialised; their main activity; the occupations and the industries in which they were employed. This will go some way towards measuring the regional return to (public and private) investments that are made into higher education.

Section 5.3 considers the overall *net* retention of graduates in each region i.e. graduate brain-drain or brain-gain. The size of graduate brain-drain/gain in each region is calculated as a proportion of the local graduate population. The section also examines the extent to which brain-drain or gain occurred in particular subject areas and levels of qualification. This enables the identification of specific areas in which brain drain/gain may have a bearing upon skills shortages within the context of developing a knowledge-based economy (e.g. Scottish Executive 2000a). The analysis of graduate brain-drain/gain also provides insights into the labour market role of universities within each region. In other words, a secondary outcome of the analysis is the characterisation of universities in as regional 'local ladders', 'employment magnets', 'springboards' or 'temporary training grounds' (see table 3.1 in Chapter 3).

5.1. The Origin & Destination of Graduates.

The purpose of this chapter is to form a descriptive framework within which to further investigate graduate flows into and out of HEIs located in different regions across the UK. For each region, the proportion of graduates who were local in origin and the overall proportion of graduates that remained is calculated and presented for comparison in Figure 5.1. Hence it is possible to determine whether universities, in each region, were largely *self-contained* in their patterns of recruitment and retention i.e. exhibiting a high local intake of students, the majority of whom remain for employment within the region. Additionally, the examination of both student origin and final destination provides an initial insight into the extent to which graduate brain-drain/gain had occurred in each region.

Figure 5.1 The Origin & Destination of Graduates.

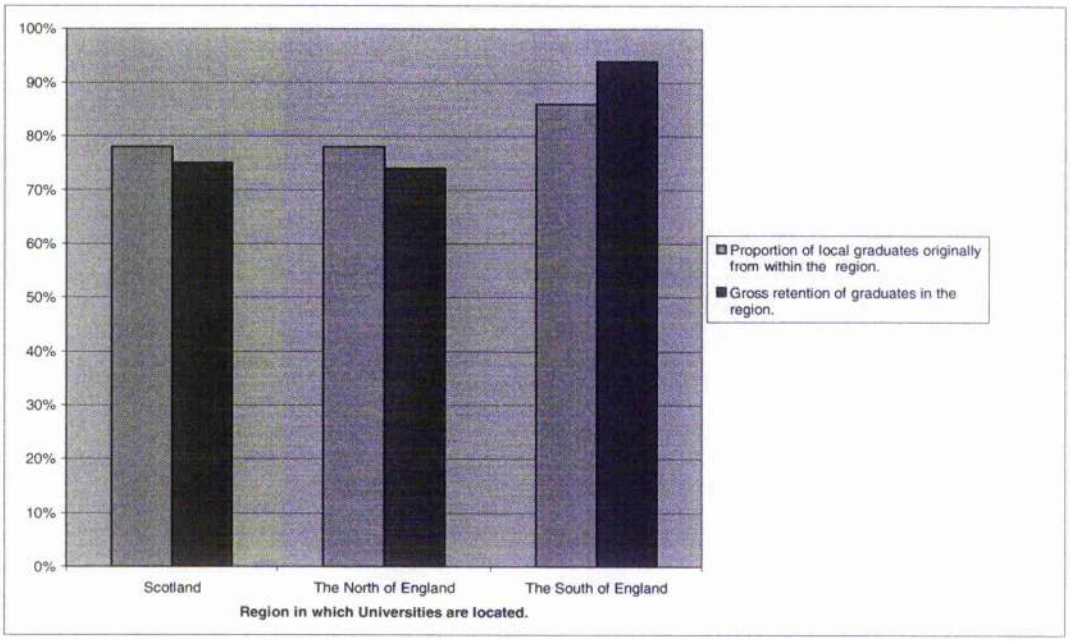


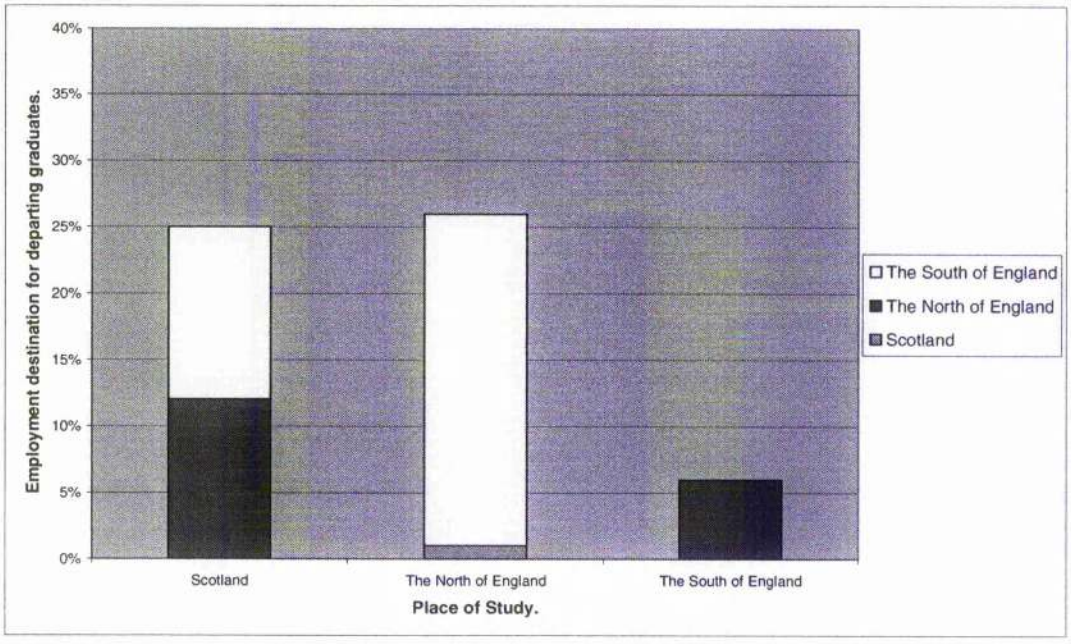
Figure 5.1 indicates that universities in all three regions had a high intake of local graduates, especially Greater London. In other words universities, taken collectively in each region, serviced a largely regional population of students. Almost 80% of graduates that had attended universities in Scotland and the

north of England were originally from within each region respectively. In the south of England, 85% of graduates were from the surrounding region.

The figures for gross retention indicate that the majority of graduates remained in the region in which they had studied. In the case of Scotland and the north of England, approximately three-quarters of all graduates who had studied there, remained there for employment afterwards. The result for the south of England shows that 95% of the total number of graduates remained there for employment afterwards. Thus, all three regions were geographically 'self-contained' in terms of their student intake and graduate retention patterns.

Additionally, from Fig 5.1 it is clear that approximately one quarter of all the graduates that had studied in Scotland and the north of England left for employment elsewhere. In contrast, less than 10% left the south of England. Fig 5.1.1, presents the main employment destination for these graduates.

Figure 5.1.1 The employment destination for graduates that left each region.



From Fig. 5.1.1 it is clear that graduates leaving Scotland located to both the south and north of England in almost equal proportions. In contrast, graduates that left the north of England almost entirely located to the south of England.

Similarly, the small proportion of graduates that left the south of England located to the north of England. Thus, the south of England is a magnet destination for graduates leaving northern Britain. This is especially the case for the north of England. However, interestingly graduates that left Scotland were attracted in almost equal proportions to both the north and south of England.

Finally, Figure 5.1 appears to substantiate concerns over a brain-drain from Scotland and the north of England. For example, there were fewer graduates who remained in Scotland and the North of England than had originated there. This is in contrast to the results for HEIs located in the south where the proportion of graduates that remained was greater than the proportion who had originated there. This is an early indication as to the south's magnet effect upon non-local graduates studying there.

However, the size of the brain-drain from the north of Britain and the gain in the south seem modest in relation to the total size of the graduate populations, although the cumulative effect could be very significant in the long-term. Previous literature on graduate loss from regions seem to have overestimated the loss of graduates from regions by failing to consider the initial origin of the graduates themselves and any outflow in *net* terms (see DTI , 2001 for an example of this overestimation).

The findings so far have highlighted the predominantly self-contained nature of graduate origin and destination in each region. In other words, universities are already highly regionalised in terms of their graduate profiles. The next stage of the analysis considers the rate of retention amongst (a) local-origin graduates and (b) graduates originally from beyond the region (referred to as 'external' graduates). This goes towards identifying the labour market role of HEIs (taken collectively) in each region.

Figure 5.1.2. Rates of retention amongst local and external graduates.

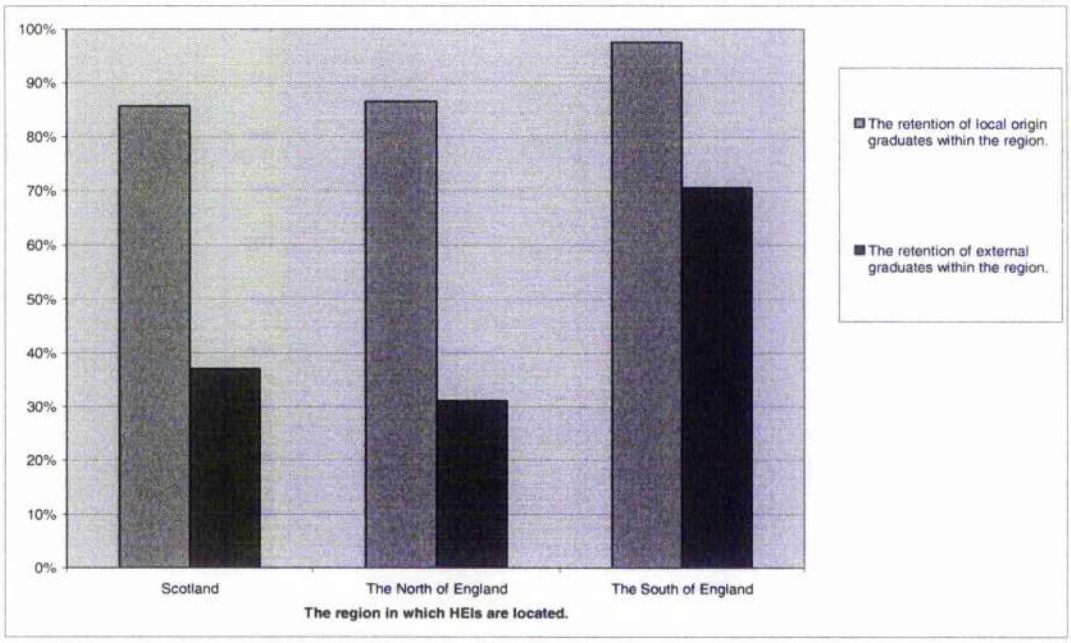


Fig 5.1.2 particularly highlights the distinctiveness of the south of England. Nearly 100% of all local graduates that had studied there remained for employment afterwards. Even more distinctive was the fact that the retention of external graduates was also substantial. 70% of external graduates who had studied in the south remained there for employment. In contrast, only 30% - 40% of external graduates chose to remain in Scotland or the north.

Clearly, the south of England had functioned as a strong *local-ladder* for local graduates, and as an effective *employment-magnet* for external graduates. Scotland and the north of England also functioned as strong *local ladders*, having retained approximately 85% of all local graduates for employment. However, they clearly functioned as *temporary training grounds* for external graduates. Less than 40% of external graduates remained in Scotland for employment and only 31% remained in the north of England for employment.

Universities in all three regions functioned as strong *local-ladders*. This was their most dominant characteristic. However, universities in the north of Britain functioned as *temporary training grounds* for all external graduates. This is in direct contrast to the universities in the south of England. Universities in the

north of Britain also appear to have had a more significant *springboard* effect upon their local graduates i.e. approximately 15% of local-origin graduates left Scotland and the north for employment elsewhere, whereas less than 5% of local graduates left the south of England.

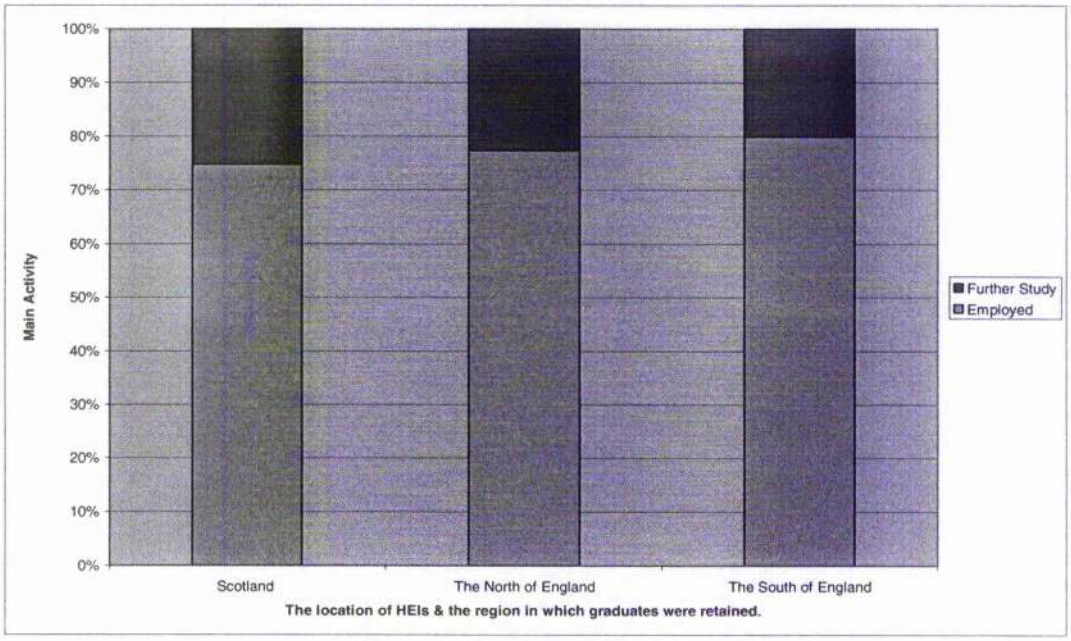
5.2 The Characteristics of Graduates Retained Within Each Region.

Section 5.1 highlighted the 'self-contained' nature of the HEIs located in Scotland, the north and the south of England. Although graduate retention in each region was strong, low levels of retention amongst external graduates was found to be a defining phenomenon for the north of Britain.

In section 5.2 the emphasis is placed upon the characteristics of the graduates retained in each region. In section 5.2.1 & 5.2.2, the analysis considers the nature of employment amongst retained graduates and the implications this may have for the region. Section 5.2.3 considers the extent of graduate underemployment in each region by examining the occupational status for retained graduates. Section 5.2.4 considers the industries which employed graduates who remained in Scotland, the north and the south of England. Finally, in section 5.2.5 and 5.2.6 the levels of qualification and subjects studied are compared amongst graduates retained in all three regions.

5.2.1 Retained Graduates and their Main Activity.

Figure 5.2.1 Retained Graduates and their Main Activity.

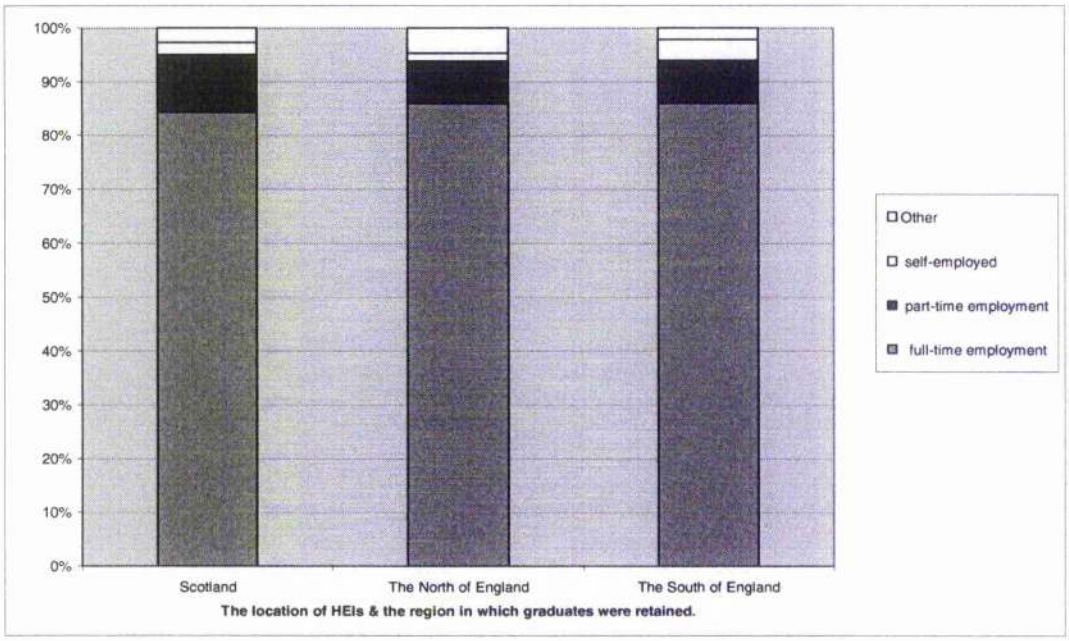


There was little variation, between regions, in the proportion of graduate employment (refer to Appendix D for definitions used). Between 75% and 80% of graduates retained in each region were in employment. The graduates retained in the south of England had the highest level of employment followed by the north of England and Scotland. Scotland had the highest proportion of graduates continuing into further study (approximately one in four).

5.2.2 Retained Graduates and Type of Employment.

This section describes the type of work undertaken by employed graduates retained in each region. Graduates are differentiated according to whether they were in full time employment, part time employment, self employed or in 'other' unpaid/voluntary activity. This in turn gives an indication as to the 'quality' of employment available to graduates retained in each region.

Figure 5.2.2 Retained graduates and type of employment

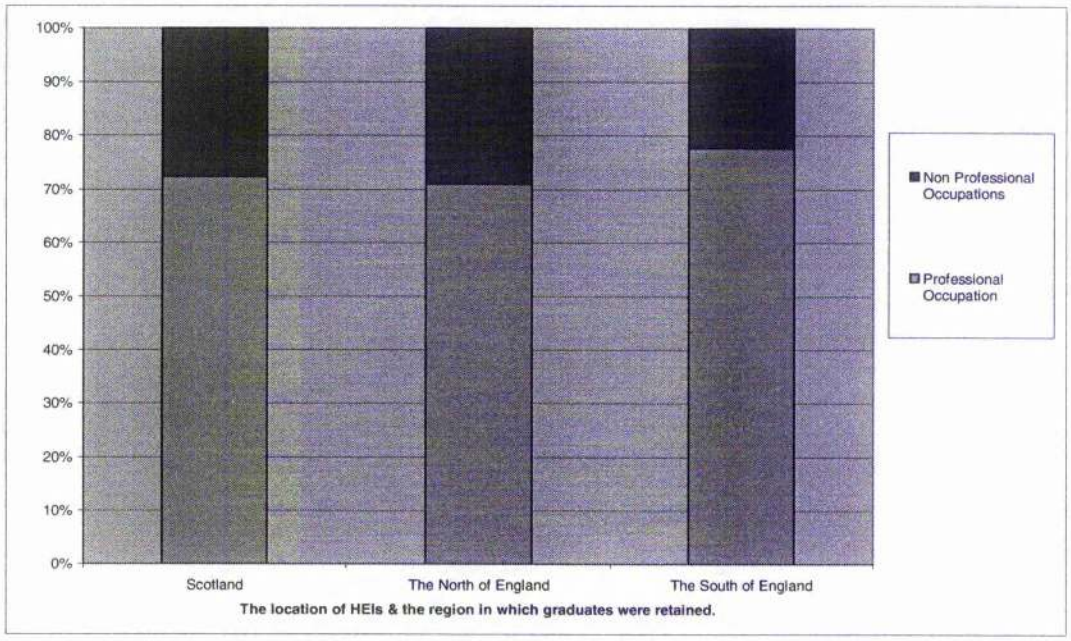


There was little variation across the regions in the proportion of retained graduates in full time employment (between 84% and 86%). However, Scotland had the highest proportion of graduates entering part-time work (10%); the north of England had the highest proportion of graduates in 'other' unpaid/voluntary employment (5% of all graduates retained in the north); and the South had a slightly higher proportion of 'entrepreneurial' graduates with 4% of retained graduates becoming self employed (compared with approximately half that proportion in Scotland and the north of England).

5.2.3 Retained Graduates and Occupational Category.

This section considers the occupational status for graduates retained in each region. The differentiation between professional and non-professional employment enables conclusions to be drawn about the possible extent of under-employment amongst graduates retained in each region.

Figure 5.2.3 The occupational status for graduates retained in each region.

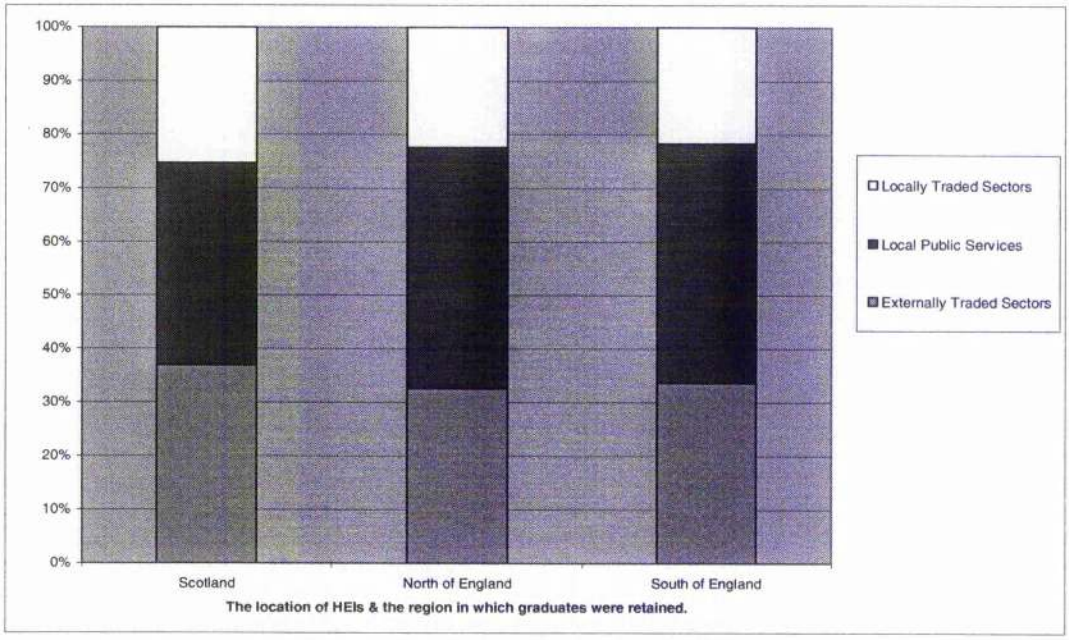


Approximately eight in every ten of the retained graduates in the South of England went into professional employment whereas in Scotland and the North the figure was closer to seven in every ten. This suggests the possibility of a slightly higher incidence of under-employment amongst graduates retained in the north of England and Scotland. Appendix G lists the definition used for the classification of non-professional occupations. At face value, these occupations appear not to require graduate qualifications. Therefore using this definition, almost one-third of the graduates retained in the north of Britain were under-employed compared to about one-fifth of graduates in the south.

5.2.4 Retained Graduates and the Industry in which they were employed.

For each region, this section examines the main industrial sectors which employed graduates. Industrial sectors have been grouped into three broad categories: local public services, externally traded sectors and locally traded sectors (see Appendix H for definition). The externally traded sector is often considered to be the most dynamic, competitive sector in the economic base of any region since it represents a source of external revenues. In contrast, employment in the public sector and in the locally traded sector, are considered to be less competitive.

Figure 5.2.4 The Industries in which retained graduates were employed.



Local Public services in the north and south of England employed the highest proportion of retained graduates. In other words, half of all graduates retained in the north and south of England were employed in the following sectors: Health, Education, Social services, Public Administration and Utilities. In Scotland, local Public services accounted for the employment of around two-fifths of all retained graduates.

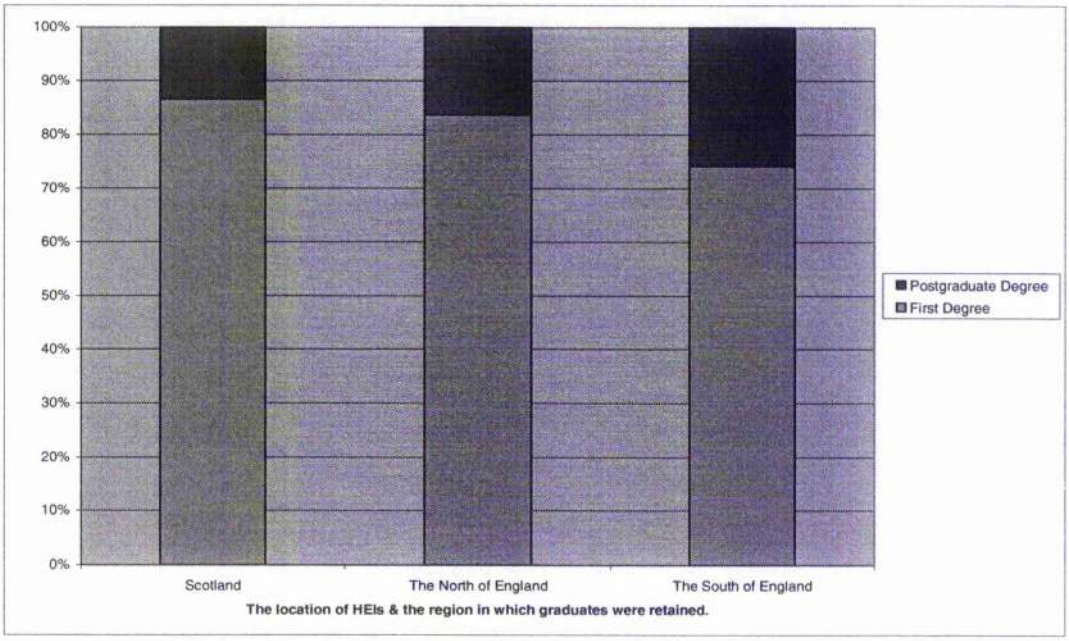
Employment in the externally traded sector was highest amongst graduates retained in Scotland (nearly two-fifths). Approximately one-third of graduates retained in the south and north of England were employed in this sector.

Employment in locally traded sectors was highest amongst graduates retained in Scotland (approximately 25%); followed by graduates retained in the north of England and the south of England (approximately 20%).

Although there were only small variations across the regions, graduates retained in Scotland appear to have been less reliant on employment by the public sector. This suggests that Scotland is not as over-reliant on the public sector to absorb graduates as some commentators have suggested (XXXX). Moreover, the south of England appears to be equally reliant on the public sector for graduate employment as the north.

5.2.5 Retained Graduates and their Level of Qualification.

Figure 5.2.5 The level of qualification amongst retained graduates.



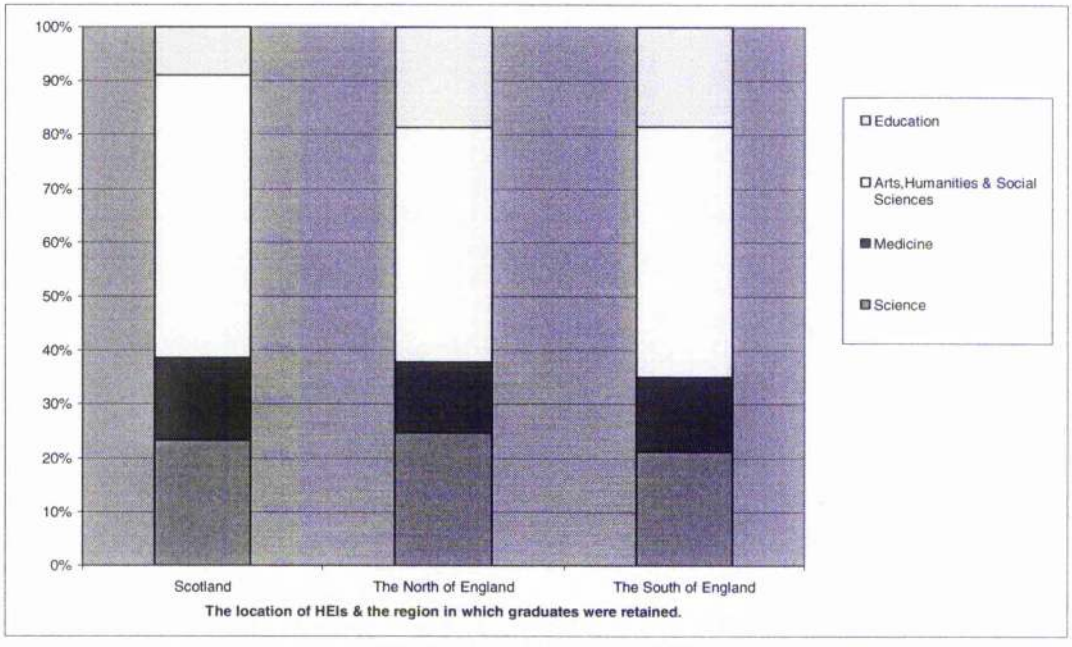
This section considers the qualifications held by graduates that were retained for employment in each region. Retained graduates are differentiated according

to whether they had first degrees or postgraduate degrees. It is assumed that the latter represents a higher level of expertise and therefore, the findings are indicative of the skill levels amongst the local population of graduates. It will also reflect the extent to which graduates with first degrees or postgraduate degrees gained employment in each region.

Figure 5.2.5 shows that nearly three in every ten of the graduates retained for employment in the South of England had a postgraduate degree. Approximately two in every ten of the graduates retained for employment in the north of England had a postgraduate qualification and approximately one in every ten of the graduates retained in Scotland had a postgraduate qualification. This implies that the skill levels amongst graduates retained in Scotland and the north of England were lower than that of the graduates retained in the South of England. It may also suggest that, compared to the south of England, there were fewer employment opportunities for postgraduates in Scotland and the north of England.

5.2.6 The Subjects Studied by Retained Graduates.

Figure 5.2.6 The Subjects studied by graduates retained within each region.



Broadly speaking, the regions did not differ to a great extent in terms of the subjects studied by retained graduates. This was especially true of the English regions. However, there was a particularly strong presence of Arts qualifications amongst graduates retained in Scotland (approximately 50%); and a weak presence of Education graduates (approximately 10%). There was very little variation in the proportion of Science graduates employed in each region. These trends may reflect the specialisations of universities in each region or the employment opportunities available to graduates from each subject category.

5.3 The Characteristics of Graduate Brain Drain & Brain Gain Across Regions.

The remaining sections in this chapter describe the nature of graduate brain-drain/gain from Scotland, the north and south of England respectively. It begins by considering the magnitude of the brain-drain/gain from the regions as a whole and then proceeds to consider the characteristics of the brain-drain/gain from each region i.e. brain drain/gain according to graduate qualification, subject studied and type of university attended. The size of each region's brain drain or brain gain is the *net effect* between the number of local origin graduates who left the region for employment elsewhere and the number of non-local ('external') graduates that remained in the region for employment. In this way it is possible to determine whether the retention of external graduates compensated for any loss in local-origin graduates.

The data for graduate origin and destination in Figure 5.1 (chapter 5.1, pp.52) indicated that graduate brain drain had occurred from universities in Scotland and the north of England. In contrast, there was a graduate brain *gain* in the south of England. Tables 5.3a, 5.3b & 5.3c overleaf, quantify this net effect as a percentage of the total number of local graduates from universities in each region (see column F in tables 5.3a to c). Tables 5.3a, 5.3b &5.3c confirm the net loss of local graduates from Scotland and the north of England.

Table 5.3.a Graduate Brain-Drain from Scotland.

	A	B	C	D	E	F
Area in which HEIs are located	Total Number of Graduates	Graduates of Scottish origin (as a % of A)	Scottish Graduates that left Scotland (as a % of B)	Non Local Graduates that remained in Scotland (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Scotland	26,839	20,810 (78%)	2981 (14%)	2236 (37%)	-745	-4%

Table 5.3b Graduate Brain-Drain from the north of England.

	A	B	C	D	E	F
Area in which HEIs are located	Total Number of Graduates	Graduates from the North of England (as a % of A)	N of England Graduates that left N.England (as a % of B)	Non Local Graduates that remained in N.England (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Northern England	56,511	44,004 (78%)	5926 (13%)	3888 (31%)	-2038	-5%

Table 5.3c Graduate Brain-Gain in the south of England.

	A	B	C	D	E	F
Area in which HEIs are located	Total Number of Graduates	Graduates from the South of England (as a % of A)	South of England Graduates that left S.England (as a % of B)	Non Local Graduates that remained in S.England (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Greater London	41,445	35,629 (86%)	875 (2%)	4103 (71%)	3228	9%

In net terms, table 5.3b indicates that the north of England lost 5%, of all local graduates. This constitutes the size of the brain drain from the north. In Scotland the brain drain was equivalent to a net loss of 4% of Scottish graduates (Table 5.3b). In contrast, the south of England experienced a net gain in graduates which increased the local population of graduates by 9% (Table 5.3c).

Column C and D in tables 5.3a, 5.3b & 5.3c also present the proportion of local graduates that left each region for employment elsewhere and the proportion of external graduates that remained. In other words, column C indicates the extent to which universities in each region functioned as *springboards* for local graduates to leave their origins[10]. Column D reflects the extent to which universities in each region functioned as *employment magnets* for external graduates. Approximately one in every ten of the Scottish-origin graduates left Scotland for employment elsewhere. One in every ten of the Northern English graduates left the north for employment elsewhere. Thus the universities in both these regions did not function as significant 'springboards' but rather as strong local-ladders. This was also the case for universities in the South where only 2% of locals left for employment elsewhere.

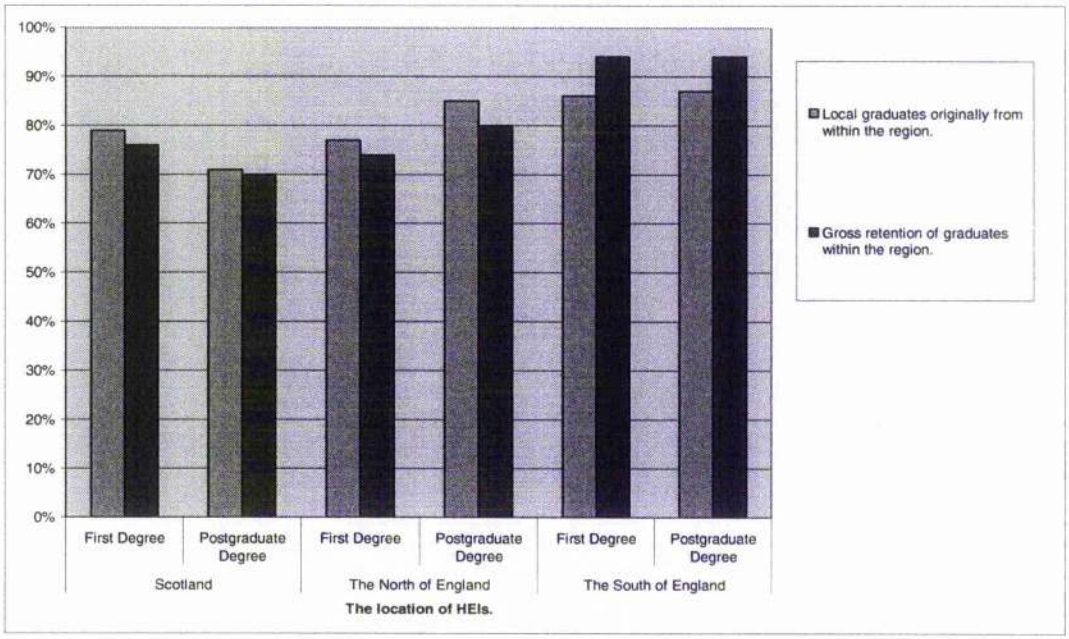
From column D in each table, it is clear that the south of England functioned as an employment magnet for external graduates, whereas the universities in Scotland and the north functioned as *temporary training grounds* for external graduates. The south of England retained approximately seven in every ten of the external graduates who had studied there; Scotland retained approximately four in every ten and the north of England retained around three in every ten. These findings, confirm a small graduate *brain drain* from Scotland and northern England, as well as the *brain gain* in the south of England. Although the brain-drain from Scotland and the north of England is small, it may have a more significant cumulative effect over time. The findings also highlight the markedly weak performances of Scotland and northern England in the retention of external graduates. The south of England in contrast was the only region to have functioned as an 'employment magnet' for external graduates.

[10] Refer to Chapter 3, pp.39 for a definition of the typology of universities and their role in the local labour market.

5.4 Regional Brain Drain and graduate Qualification.

This section considers the extent of brain drain/gain across different levels of qualification. It identifies whether regional brain drain/gain occurred amongst graduates with first degrees or those with postgraduate qualifications.

Figure 5.4 The origin and final destination of First-degree graduates & post-graduates.



From Figure 5.4, Scotland attracted the highest proportion of non-local postgraduate students for postgraduate study. However, Scotland also had the lowest overall gross retention of postgraduates for employment. In fact, around three in every ten of the postgraduates that had studied in Scotland left for employment elsewhere. In the north of England the figure was closer to two in every ten, and for the south of England it was just one in every ten. This suggests that Scotland was good at attracting postgraduates nationwide, but was less effective at having retained them for employment. Tables 5.4a, 5.4b &5.4c (overleaf) quantify the brain drain and gain in each region according to qualification.

Table 5.4a Graduate Brain-Drain from Scotland and level of qualification

	A	B	C	D	E	F
Level of Qualification	Total Number of Graduates	Graduates of Scottish origin (as a % of A)	Scottish graduates that left Scotland (as a % of B)	External Graduates that remained in Scotland (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
First Degree	22993	18086 (79%)	2551 (14%)	1843 (38%)	-708	-4%
Postgraduate Degree	3846	2724 (71%)	430 (16%)	393 (35%)	-37	-1%

Table 5.4b Graduate Brain-Drain from the north of England and level of qualification

	A	B	C	D	E	F
Level of Qualification	Total Number of Graduates	Graduates from the North of England (as a % of A)	N of England Graduates that left N.England (as a % of B)	External Graduates that remained in N.England (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
First Degree	47940	36720 (77%)	4953 (13%)	3368 (30%)	-1585	-4%
Postgraduate Degree	8571	7284 (85%)	973 (13%)	520 (40%)	-453	-6%

Table 5.4c Graduate Brain-Gain in the south of England and level of qualification

	A	B	C	D	E	F
Level of Qualification	Total Number of Graduates	Graduates from the South of England (as a % of A)	S of England Graduates that left S.England (as a % of B)	External Graduates that remained in S.England (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
First Degree	30717	26338 (86%)	578 (2%)	3057 (70%)	2479	9%
Postgraduate Degree	10728	9291 (87%)	297 (3%)	1046 (73%)	749	8%

Table 5.4a presents the results for Scotland. A number of points can be made about the nature of the brain drain from Scotland. From column F, it is clear that the size of Scotland's brain-drain was proportionately larger amongst first-degree graduates. There was a net loss of 4% of First degree graduates from Scotland. The brain drain in postgraduates, on the other hand, was equivalent to a net loss of 1%. Column C reflects the extent to which Scottish universities functioned as local ladders for both first-degree graduates and postgraduates. There was a strong local ladder effect across both groups with over 80% of local first-degree graduates and postgraduates remaining for employment in Scotland. Column D reflects the employment magnet effect upon external graduates. There was a low retention of non-locals in Scotland, especially those with postgraduate qualifications. In both cases, less than two-fifths of external first-degree graduates and postgraduates remained for employment within Scotland. This indicates that Scotland was a *temporary training ground* for external first-degree and post-graduates.

The results from Table 5.4b (on page 86), indicate that the brain drain, in proportional terms, from the North of England was greater amongst graduates with postgraduate qualifications (a net loss of 6%) than those with first degrees (a net loss of 4%). Column C indicates that the universities in the north of England were strong local ladders with nearly 90% of local first-degree and post-graduates remaining for employment in the region. Column D indicates a particularly low gross retention of external first-degree graduates in the north of England (just 30% remained for employment). However, gross retention of external postgraduates was slightly higher (40% remained for employment). Thus the north of England was clearly a temporary training ground for external first-degree graduates but less so for external post-graduates.

Table 5.4c (on page 86) presents the contrasting results for the South of England. In the case of this region, the brain gain was similar in proportional terms across both postgraduates and graduates with first degrees. There was a net gain of 9% in first degree graduates and an 8% net gain in postgraduates.

Table 5.4.1a Scotland's Graduate Brain Drain/Gain and Subject Area.

	A	B	C	D	E	F
Subject	Total Number of Graduates	Graduates originally from Scotland (as a % of A)	Local origin Graduates that left Scotland (as a % of B)	External Graduates that remained in Scotland (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Agriculture & Veterinary Science	729	390 (53%)	110 (28%)	53 (16%)	-57	-15%
Applied Sciences	3559	2936 (82%)	819 (21%)	240 (39%)	-379	-13%
Arts, Humanities, Languages & Combined	7193	5231(73%)	772 (15%)	660 (34%)	-112	-2%
Education	1960	1800 (92%)	95 (5%)	57 (36%)	-38	-2%
Medicine & related	3855	2872 (75%)	384 (13%)	542 (55%)	158	6%
Natural Sciences	2935	2116 (72%)	379 (18%)	301 (37%)	-78	-4%
Social Sciences, Business & Law	6608	5465 (83%)	622 (11%)	383 (34%)	-239	-4%
Grand Total	26839	20810 (78%)	2981 (14%)	2236 (37%)	-745	-4%

Table 5.4.1b Graduate Brain drain/gain from the north of England and subject area.

	A	B	C	D	E	F
Subject	Total Number of Graduates	Graduates from the North of England (as a % of A)	Local origin graduates that left N.England (as a % of B)	External Graduates that remained in N.England (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Agriculture & Veterinary Science	613	431 (70%)	66 (15%)	60 (33%)	-6	-1%
Applied Sciences	7934	6288 (79%)	1416 (23%)	480 (29%)	-936	-15%
Arts, Humanities, Languages & Combined	15177	10714 (71%)	1587 (15%)	1122 (25%)	-465	-4%
Education	6798	7938 (90%)	560 (7%)	361 (42%)	-199	-3%
Medicine & related	6310	4990 (79%)	376 (8%)	853 (66%)	477	10%
Natural Sciences	6982	5184 (74%)	782 (15%)	502 (28%)	-280	-5%
Social Sciences, Business & Law	10697	8459 (79%)	1139 (13%)	510 (23%)	-629	-7%
Grand Total	56511	44004 (78%)	5926 (13%)	3888 (31%)	-2038	-5%

Table 5.4.1c Graduate Brain gain in the south of England and subject area.

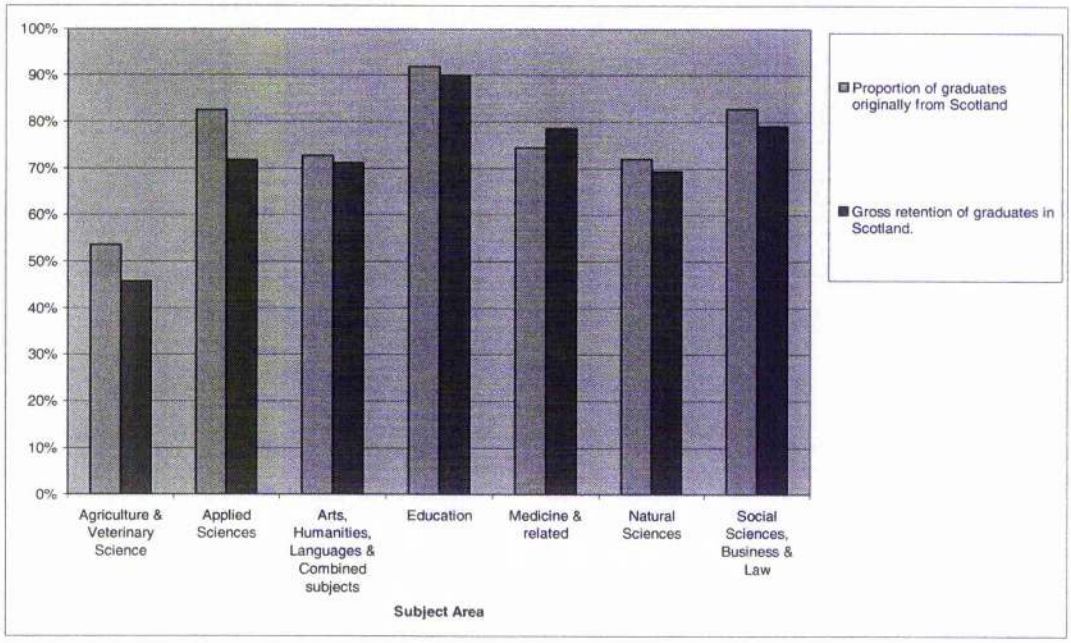
	A	B	C	D	E	F
Subject	Total Number of Graduates	Graduates from the South of England (as a % of A)	Local origin graduates that left S.England (as a % of B)	External Graduates that remained in S.England (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Agriculture & Veterinary Science	256	167 (65%)	29 (17%)	36 (40%)	7	4%
Applied Sciences	5130	4457 (87%)	185 (4%)	493 (73%)	308	7%
Arts, Humanities, Languages & Combined	11376	9578 (84%)	168 (2%)	1267 (70%)	1099	11%
Education	7506	6734 (90%)	127 (2%)	561 (73%)	434	6%
Medicine & related	5835	4732 (81%)	188 (4%)	822 (75%)	634	13%
Natural Sciences	3724	3078 (83%)	79 (3%)	432 (67%)	353	11%
Social Sciences, Business & Law	7618	6883 (90%)	99 (1%)	492 (67%)	393	6%
Grand Total	41445	35629 (86%)	875 (2%)	4103 (71%)	3228	9%

Column C indicates a strong local ladder effect amongst local postgraduates and first degree graduates (in each category, less than 5% of local graduates left). Column D shows the strong retention effect that the South has upon all its external graduates i.e. 70% of external first degree graduates, and 73% of external postgraduates remained for employment in the south. Clearly, the South of England was an *employment magnet* for graduates with both levels of qualification.

Universities in each region functioned predominantly as 'local-ladders' for both first degree graduates and postgraduates. The south of England was the only region to have functioned as an employment magnet for external postgraduates. Although Scotland and the north of England both functioned as strong local-ladders for the local first degree and post-graduate population, both functioned as temporary training grounds for external graduates and postgraduates.

5.4.1 Regional Brain Drain/Gain and Subject Area.

Figure 5.4.1a The origin and destination of graduates from Scottish Universities differentiated by subject area



For each region, this section considers the brain-drain and/or brain-gain in graduates across seven broadly defined subject areas (see Appendix F). This identifies the subject areas from which graduate brain-drain had been particularly strong and/or weak. In addition, a number of secondary points emerge from the analysis such as the extent to which graduate origin & destination in each subject area is 'self-contained'. Furthermore, the analysis into graduate retention allows for a detailed examination of the labour market role of HEIs across different subject areas and in each region.

Figure 5.4.1a indicates that Scotland was largely 'self-contained' in terms of graduate origin and destination across all the subject areas. The only exceptions to this were Agricultural & veterinary graduates, nearly half of whom did not come from, or stay in Scotland for employment. The subject areas in which Scotland had particularly 'self-contained' graduate profiles were: the Applied Sciences, Education and Social Sciences. Over 80% of these graduates were Scottish in origin.

Figure 5.4.1a also indicates strong gross retention effects amongst graduates in each discipline (except Agriculture) with over two-thirds of all graduates remaining in Scotland for employment. Gross retention of Education graduates was particularly strong with 90% having been retained in Scotland for employment.

However, Figure 5.4.1a also indicates a brain-drain in graduates from all subject areas except Medicine. From Table 5.4.1a (refer to page 88), the largest brain-drains from Scotland occurred amongst Agricultural and Applied Science graduates. The size of the loss was equivalent to a net loss in local origin graduates of 15 % and 13% respectively. The net loss in Applied Science graduates is particularly significant given that the discipline is central to discussions relating to skills shortages. In addition, it is a subject area with a strong *local* intake of students. Graduate brain drain in the remaining subject areas (except Medicine) was below 5%. In contrast, there was a 6% brain-*gain* in Medicine graduates remaining in Scotland for employment. This indicates that there was a significant retention effect upon external Medicine graduates

remaining in Scotland for employment. This is proven to be true from column D in Table 5.4.1a which shows that over half of all external Medicine graduates remained in Scotland for employment.

Column C in Table 5.4.1a shows an overall strong local-ladder effect for Scottish origin graduates in each subject category. Approximately 70% of all Scottish graduates in each subject area remained in Scotland for employment. However, this effect was weakest amongst agricultural and Applied Science graduates. Over one-quarter of all Scottish Agricultural graduates left for employment elsewhere and just over one-fifth of all Scottish Applied Science graduates left Scotland.

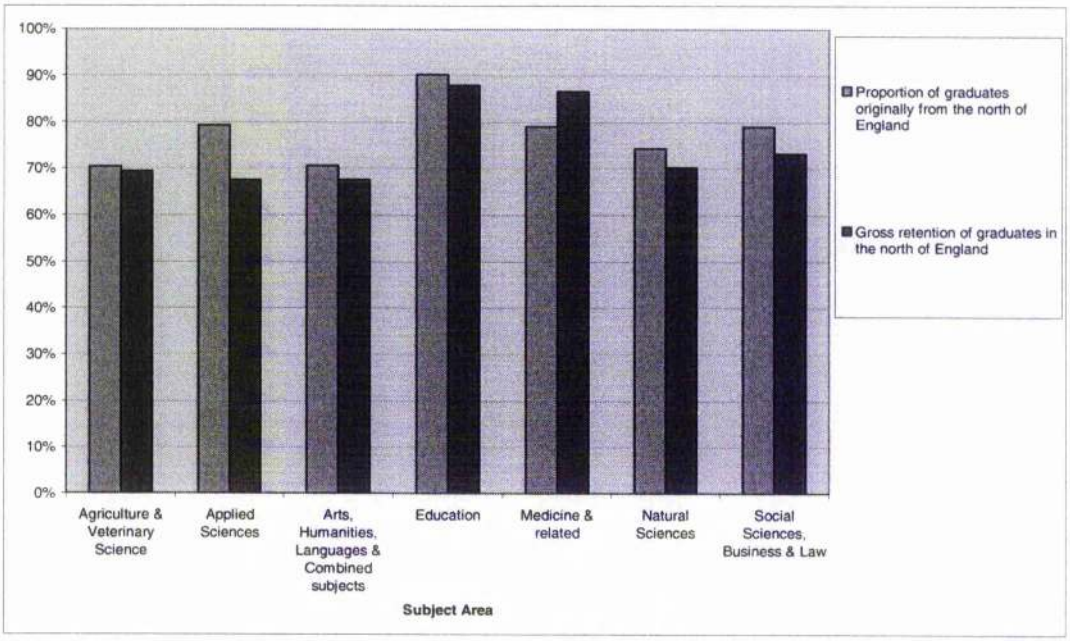
Column D in Table 5.4.1a, indicates that Scotland's HEI's functioned as *temporary training grounds* for all external graduates except Medical graduates. Scotland was an *employment magnet* for external Medicine graduates. The temporary training ground effect of Scottish HEIs was particularly strong amongst external Agricultural, Arts and Social Science graduates. With the exception of Agriculture and Medicine, only between 34% and 39% of external graduates in each subject area, actually remained in Scotland for employment. Finally, except for Medicine, there were brain-drains across all subject areas. The most significant brain-drain had occurred amongst Scottish Applied Science graduates.

Figure 5.4.1b overleaf, presents the results for the north of England. Once again, the origin & destination for graduates in each subject area was highly *self-contained.* At least 70% of graduates in each subject area were originally from the north of England. Figure 5.4.1b also indicates strong gross retention figures amongst all graduates. Gross retention was especially strong amongst Education and Medicine graduates, nearly 90% of whom remained in the north for employment. Gross retention in the remaining subject areas was between 68% and 75%.

Figure 5.4.1b also indicates that there was a brain drain in northern English graduates from each subject area except Medicine. From Table 5.4.1b (refer to

page 88), the largest brain drain in the north of England occurred amongst Applied Science graduates. There was a net loss of 15% of graduates in this discipline. There was 7% net loss in Social Science graduates and a 5% net loss in Natural Science graduates. Except for Medicine, there were net losses of less than 5% in the remaining subject areas. In contrast, there was a 10% brain gain in Medicine graduates.

Figure 5.4.1b The origin & destination of graduates from northern English universities.



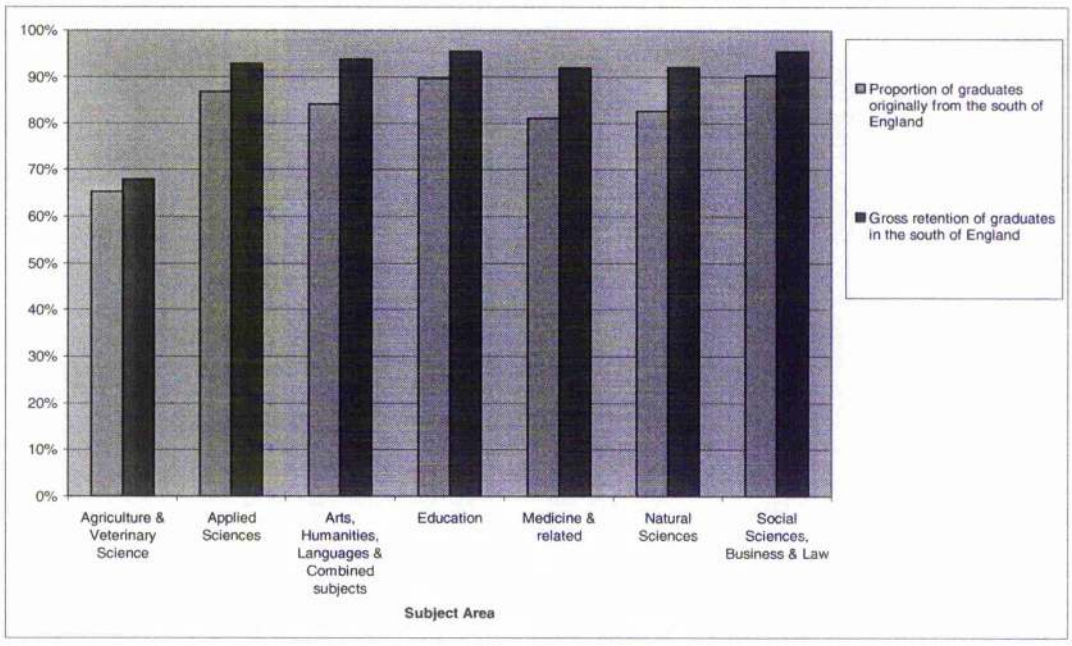
Column C from Table 5.4.1b (page 88) shows an overall strong local-ladder effect for northern English graduates. At least 70% of all northern English graduates in each subject area remained within the region for employment. However, the effect was weakest amongst Agricultural and Applied Science graduates. Over a quarter of local northern English Agricultural graduates left the region for employment elsewhere and just over one-fifth of local Applied Science graduates left the region for employment elsewhere. Proportionately, these results are similar to Scotland.

Column D in Table 5.4.1b (refer to page 88) indicates that the HEIs in the north of England functioned as temporary training grounds for all external graduates

except Medical graduates. The north of England was an employment magnet for the latter group. Like Scotland, the temporary training ground effect was particularly strong amongst external Agricultural graduates, Arts and Social Science graduates. Brain-drain was most significant amongst Applied Social Science graduates.

Figure 5.4.1c presents the contrasting results for the south of England. The origin and destination of graduates from southern English universities were exceptionally self-contained. For each subject area, between 80% and 90% of graduates were local in origin. The only exception being Agriculture, in which 67% of graduates were local in origin. The gross retention for graduates in each subject area was also exceptionally strong in the south of England. For each subject area (except Agriculture), over 90% of all graduates remained within the south of England for employment. Fig 5.4.1c also indicates that there were brain-*gains* in graduates in each subject category. This is quantified in Table 5.4.1c, column F (refer to page 88).

Figure 5.4.1.c The origin & destination of graduates from southern English universities.



From Table 5.4.1c (on page 88), it is clear that the south of England had experienced brain-gains in graduates from each subject area. The strongest brain-gains were in Medicine, the Arts and Natural Sciences. There were net gains of over 10% in each of these subject areas. The remaining subject areas had experienced brain gains of under 10%.

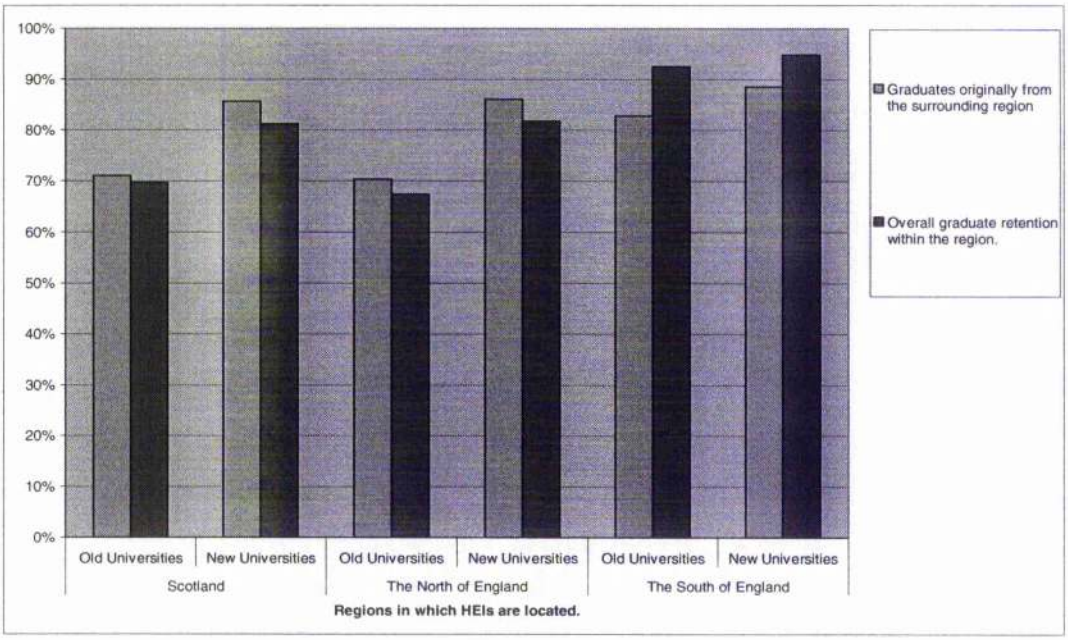
Column C in Table 5.4.1c, shows the strong local ladder effect of HEIs in the south of England. In all subject areas (except for Agriculture) over 9% of all local origin graduates remained in the south for employment. With the exception of Agriculture, column D in the same table shows the exceptionally strong employment-magnet effect that the south of England had upon all external graduates. At least two-thirds of all external graduates in each subject area remained in the south of England for employment after having attended university there.

Thus overall, the South of England was highly distinctive from the other regions in that a negligible proportion of local-origin graduates in each subject area left the region for employment elsewhere, and a high proportion of external graduates remained within the region for employment.

Scotland and the north of England were characterised by a strong retention of all local-origin graduates in each subject area. However, except for Medicine graduates, both these regions had a weak retention effect upon all external graduates. The north of England appeared to have had a marginally weaker effect than Scotland in this respect. In addition, for both Scotland and the north of England, graduates with qualifications in the Applied and Natural Sciences were amongst the most likely to leave. One in five local origin graduates in the Applied Sciences left Scotland. For the north of England, the figure was closer to one in four.

5.4.2 A comparison of 'old' and 'new' universities.

Figure 5.4.2a. A comparison of graduate origin and destination in old and new universities.



The purpose of this section is to compare graduate origin, destination and brain drain/gain, across different types of universities located within each region. Universities are differentiated according to whether they are old institutions (pre 1992 university status) or new institutions (post 1992 university status). Appendix C presents the full definition for these groupings.

From Figure 5.4.2, it is evident that in all three locations, the new universities are more self-contained in their graduate recruitment and graduate retention patterns.

The results for new universities in Scotland and the north show that approximately 85% of graduates were originally from the surrounding region itself and approximately 80% of graduates were retained within each region. For both Scotland and the north of England, approximately 70% of graduates at old universities were local in origin. Overall retention rates for graduates qualifying from old universities in both Scotland and the north of England was just under

70%. Thus, new universities are clearly dominated by a more 'local' graduate population and have higher rates of gross retention but also higher level of net loss on account of the small external graduate population.

Tables 5.4.2a, 5.4.2b, 5.4.2c (overleaf) reflect the patterns in Figure 5.4.2. The tables indicate that local origin graduates were more likely to have left the region if they attended an old university rather than a new one. For example, for local-origin graduates attending old universities in Scotland and the North of England, approximately one-fifth left for employment elsewhere. In contrast only around one-tenth of the local origin graduates, that had attended new universities in Scotland and the north, left the region for employment elsewhere. Thus, the new universities had a stronger 'local ladder' effect whereas older universities had a significant 'springboard' effect.

The south of England was the exception, with high levels of retention amongst both local-origin and external graduates. For both old and new universities in Greater London, nearly all the local-origin graduates were retained in the south of England for employment. The retention of external graduates in both types of institution, was exceptionally high with approximately seven in every ten remaining in the south for employment.

The final column in each table, quantifies the brain drain/gain from the different types of university in each location. It is clear that Greater London and the south experienced brain gains at both types of institution, with the older universities experiencing a higher brain gain. In Scotland and the north of England, a brain drain had occurred from both types of universities.

Table 5.4.2a Graduate brain drain from old and new universities in Scotland

	A	B	C	D	E	F
Type of University	Total Number of Graduates	Graduates originally from Scotland (as a % of A)	Scottish origin graduates that left Scotland (as a % of B)	External graduates that remained in Scotland (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Old universities	14540	10325 (71%)	1793 (17%)	1602 (38%)	-191	-2%
New universties	12228	10469 (86%)	1172 (11%)	634 (36%)	-538	-5%

Table 5.4.2 b Graduate brain drain from old and new universities in the north of England

	A	B	C	D	E	F
Type of University	Total Number of Graduates	Graduates from the North of England (as a % of A)	Northern Graduates that left N.England (as a % of B)	External Graduates that remained in N.England (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Old universites	29343	20614 (70%)	3612 (18%)	2761 (32%)	-851	-4%
New universties	27168	23390 (86%)	2314 (10%)	1127 (30%)	-1187	-5%

Table 5.4.2c Graduate brain gain across old and new universities in the south of England

	A	B	C	D	E	F
Type of University	Total Number of Graduates	Graduates from the South of England (as a % of A)	S of England Graduates that left S.England (as a % of B)	External Graduates that remained in S.England (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
Old universities	18881	15634 (83%)	522 (3%)	2354 (72%)	1832	12%
New universties	22564	19995 (89%)	353 (2%)	1749 (68%)	1396	7%

It is clear that in both Scotland and the north, the new universities, were more self-contained. Both old and new universities functioned predominantly as 'local ladders'. However, the effect was stronger across the new institutions. In other words, local graduates were more likely to leave the region if they had attended an 'old' university. Both old and new universities in Scotland and the north functioned as temporary training grounds for external graduates. This effect was also stronger amongst the new universities. The old & new universities in the south of England were highly distinctive, functioning as strong 'local ladders' for local graduates and strong 'employment magnets' for external graduates.

5.5 Summary.

Chapter five has shown that the pattern of graduate origin and destination across Scotland, the north and the south of England, was very much 'self-contained'. Overall, universities in all three regions serviced the educational needs of a largely local population of students, the majority of whom were retained for employment afterwards. As such, the HE sector is already highly regionalised in this respect. This somewhat contradicts the discourse which calls for greater regionalisation of the HE sector both in terms of recruitment and teaching practices (OECD, 1999a). The overall gross retention of graduates in each region was shown to be strong with 95% of all graduates retained in the south of England and approximately 75% of all graduates retained in Scotland and the north of England respectively. However, the latter two regions also experienced a modest net loss or brain drain in graduates. Although the size of the brain drain may appear modest, it could have a significant cumulative effect over time.

The predominant characteristic for universities, taken collectively, in each region was to function as local-ladders for local students. This is a positive outcome for all the regions. However, Scotland and the north of England had poor retention effects upon all non-local graduates. In contrast, Greater London and the south had a very strong retention effect upon this group. Thus, the south was the only region to have functioned as an employment magnet upon all external graduates. The universities located in Scotland and the north of England functioned as temporary training grounds for external graduates.

The level of professional employment was highest amongst graduates retained in the south of England and lowest amongst graduates retained in the north of England and Scotland. This can be interpreted as indicative of a higher rate of under-employment amongst graduates retained in Scotland and the north. Additionally, the level of part-time employment was highest amongst graduates retained in Scotland and lowest amongst graduates retained in the south of England. A further surprising finding was the minimal variation in employment by the public sector across all three regions. In fact, Scotland proved to be the most diverse in terms of employment by industrial sector, having had a high proportion of retained graduates employed in externally and locally traded sectors. The south of England appeared to be equally reliant upon the public sector for graduate employment as the north of England.

The subjects studied by retained graduates in the south and north of England followed a similar pattern. Scotland differed slightly in having a much higher proportion of Arts graduates and Medicine graduates, as well as a particularly low proportion of Education graduates amongst those retained. The proportion of retained Science graduates was approximately the same across all three regions. However, the proportion of postgraduate skills amongst graduates retained in the north of Britain was much lower than in the south. This suggests a proportionately lower skill-level amongst graduates retained in the north of Britain. It may also be indicative of fewer employment opportunities for graduates with postgraduate degrees in these regions.

So far, the findings have indicated that all regions are 'self-contained' in terms of graduate origin and retention. However, the south exhibited the strongest magnet effect upon both local graduates and external graduates. In addition, there are early indications as to a slightly higher incidence of under-employment amongst graduates retained in the north of Britain as opposed to those in the south. Overall, the south appears to have experienced a brain-*gain* and the north, a brain-drain. However, the size of both, appear to be small in proportion to the size of the total graduate population. This would suggest that the situation is not as pressing as some would suggest although, over time the net loss may have a

significant cumulative effect. The brain drain in regional graduates was largest from the north of England which, in net terms, lost 5% of its graduates. This was followed by Scotland which experienced a 4% net loss in graduates. In contrast, the south of England had experienced a 9% brain gain in graduates.

Amongst the most important trends, was a weak retention of external graduates by both Scotland and the north of England. As well as having had the lowest gross retention of postgraduates overall (70%), Scotland performed weakly in the retention of external postgraduates (retaining just 35% of non-local postgraduates that had studied there). Both Scotland and the north of England experienced brain drains amongst both first degree graduates and postgraduates. The brain drain from both Scotland and the north of England had occurred across all the subject areas except for Medicine in which there was a brain gain. The subject in which there was the largest brain drain from both Scotland and the north was the Applied Sciences. A net loss equivalent to 13% and 15% of the local population of Applied Science graduates in Scotland and the north respectively. The south of England remained distinctive throughout, having experienced a brain-gain in all the categories, losing very few local origin graduates and retaining nearly all external graduates for employment. This highlights the magnet effect that this region has upon all types of graduates.

Across each subject category, universities across Scotland and the north of England functioned as strong local-ladders. However, unlike the south of England, very few external graduates were retained for employment in Scotland and the north of England. Thus, Scotland and the north of England were predominantly temporary training grounds for non-locals. These findings provide a useful contrast between Scotland, the North and the South of England, effectively highlighting the especially weak retention of non-local graduates in Scotland and the north of England. There also appears to have been a significant brain-drain in Applied Science graduates from Scotland and the north. Furthermore, the patterns of employment amongst retained graduates indicate a higher incidence of under-employment for graduates retained in the north of Britain. These initial findings indicate that the current regionalisation agenda is overemphasised given that student recruitment and graduate retention already

appears to be highly regionalised. However, the differentiation in employment outcomes for graduates retained in the north raises some important questions within the context of increasing graduate retention in peripheral areas to meet the allegedly growing demands of a high-skills, knowledge economy.

Chapter 6. Cities and Graduate Origin, Destination and Brain-Drain.

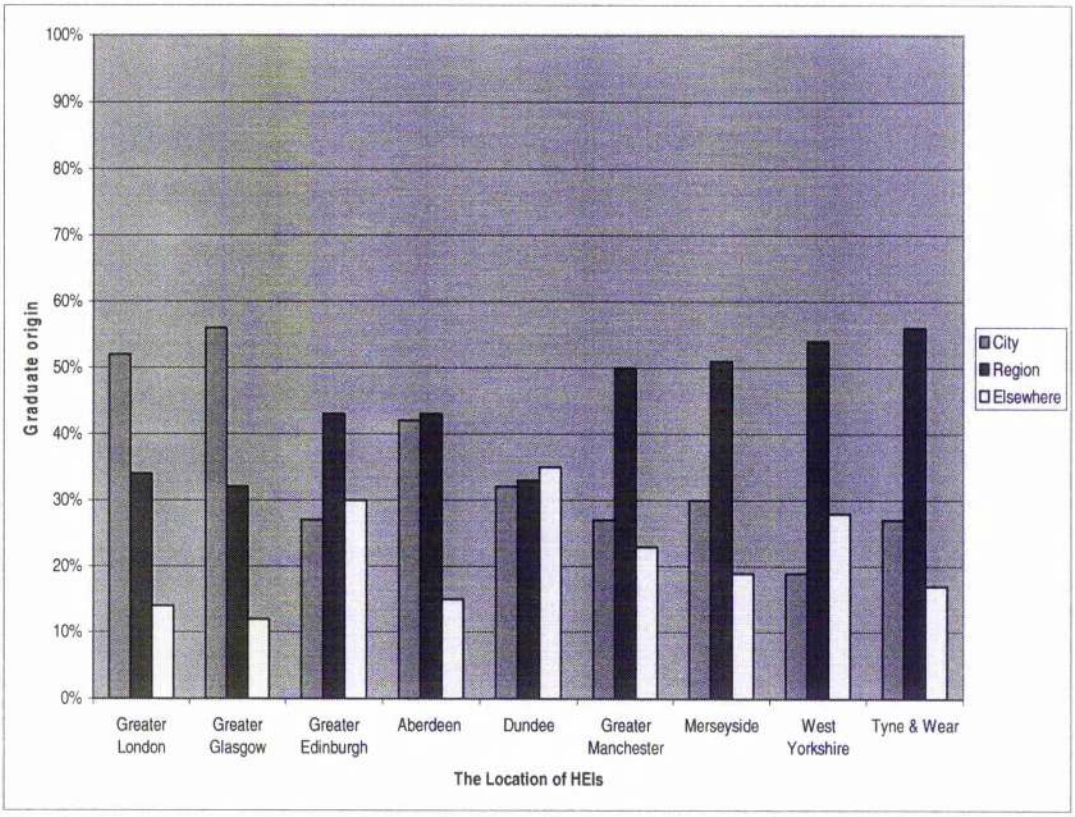
This chapter discusses the nature of graduate origin and destination at *city* level. This enables an exploration of graduate origin, destination and brain-gain at city level. In addition the analysis will identify the role of universities in their local labour markets, and the extent to which cities differed in terms of graduate retention levels and employment. This is particularly significant given the emphasis that cities place upon the need to attract highly skilled individuals for developmental, economic and fiscal reasons. The cities chosen for analysis are: Greater London, Greater Glasgow, Greater Edinburgh, Aberdeen, Dundee, Greater Manchester, Merseyside, Tyne & Wear and West Yorkshire.

Chapter 6.1 considers the origin of the graduates who had studied at universities located in each city. The chapter describes the student population within each city and the extent to which it is *locally* or *nationally* orientated. This is followed by an examination of graduate destinations. Section 6.2 considers graduate retention within cities. The main outcome of this is a characterisation of universities and their labour market role in each city. In other words, the section examines the extent to which HEIs, taken collectively, functioned as local ladders, employment magnets, temporary training grounds or springboards (refer to chapter 3, pp 39 for a definition of the typology used).

Section 6.3 examines the characteristics of the graduates that were retained for employment in each city. The section begins by considering the origin of retained graduates; the nature of their employment and occupational status and the industries which employed them. This will give some indication as to the quality of employment for graduates in each city. Section 6.4 examines brain-drain and brain-gain across the nine cities. The final section draws conclusions from the findings.

6.1 The Origin & Destination of Graduates at City Level.

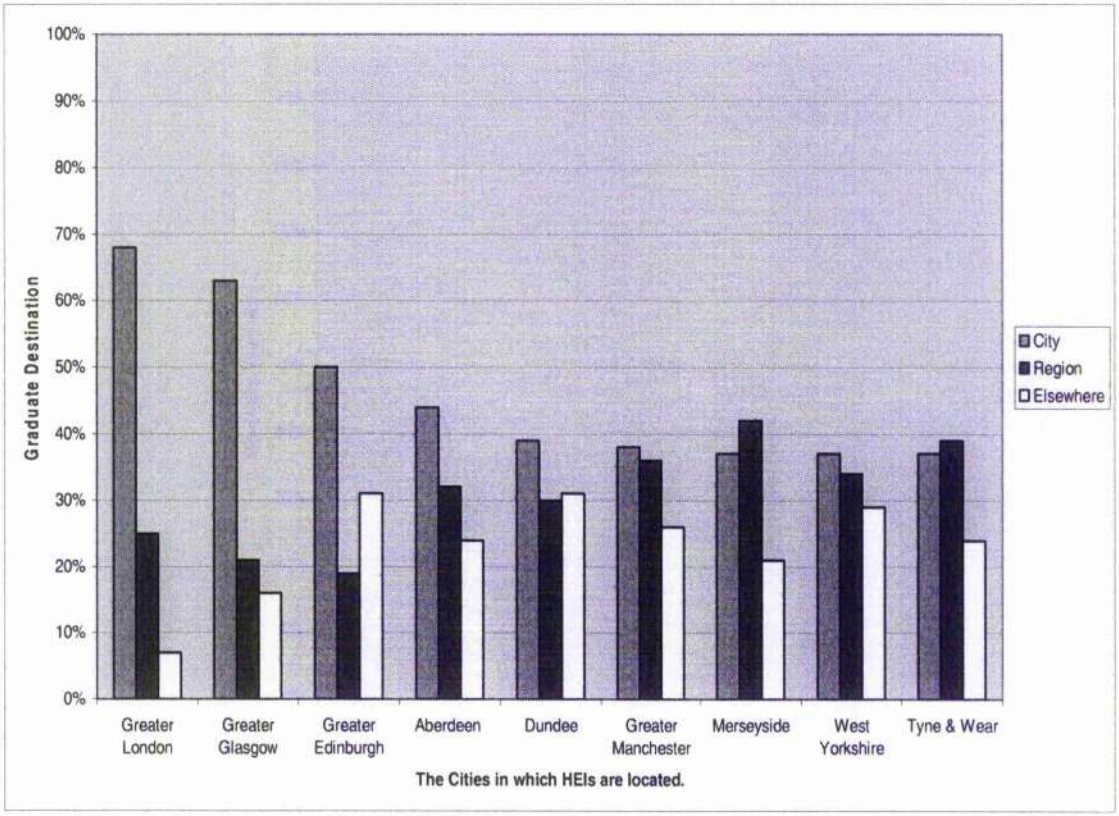
Figure 6.1a The Origin of Graduates that had studied within each city.



n.b. A full explanation of the boundary definitions are given in appendix B.

Figure 6.1a presents the origin of graduates that had studied at HEIs located in each city. There are clear patterns amongst the different groups of cities. The majority of graduates that had studied at universities in the northern English cities were from within the region itself i.e. at least half were from the north of England. Tyne & Wear was the most marked case of this. The Scottish universities drew more students from their immediate cities. Glasgow was the most marked case of this. Greater London had a similar profile to that of Glasgow. Dundee, Edinburgh and West Yorkshire were the most nationally orientated in terms of attracting students from beyond the immediate city & region.

Figure 6.1b. The employment destination for graduates that had studied in each city.



n.b. A full explanation of the boundary definitions are given in appendix B.

Figure 6.1b indicates that the 'city' in which graduates had studied was a dominant final destination for employment. This was most clearly the case for Greater London, Glasgow and Edinburgh. Over 60% of all graduates that had studied in Greater London and in Glasgow remained there for work afterwards. In Edinburgh, half of all graduates that had studied there remained in the city for employment. The northern English cities were distinctive in the importance of the surrounding region as an employment destination. Consequently, in terms of retaining their graduates in gross terms, Greater London, Greater Glasgow and Edinburgh were the most significant.

In overall terms, G. London and the Scottish cities benefited the most from graduate retention. The northern English cities benefited the least. This is

perhaps reflective of the proximity to other cities within the northern English cities and the sheer size of the London economy.

6. 2 Cities & the retention rates for graduates from different origins.

This section considers retention rates for graduates from different origins. The expectation is that students originally from within the city or region will be more likely to stay in the city they had studied in.

Figure 6.2a The retention rates for graduates from different origins

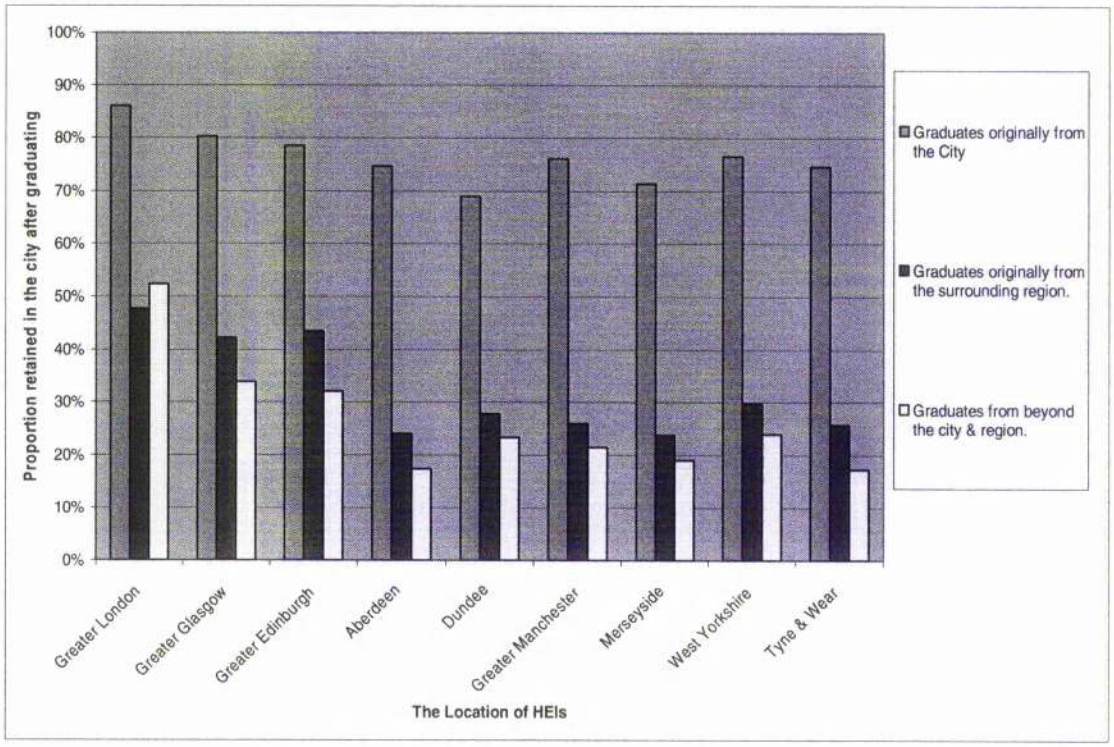
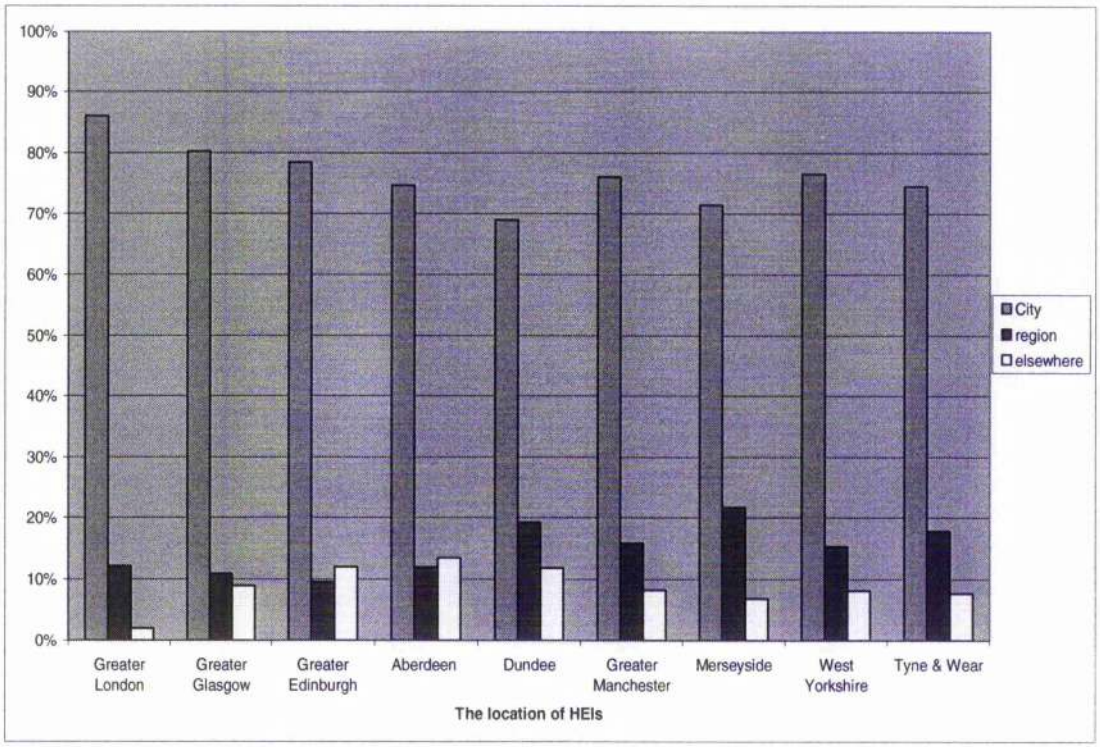


Figure 6.2a presents the gross rates of retention for graduates originally from (a) the city (b) the region and (c) beyond the region. Clearly, retention rates were highest amongst graduates originally from the city. This is an important general finding. All cities retained more than two-thirds of their local students after graduating. Interestingly rates of retention were highest across all three categories in cities such as London, Glasgow and Edinburgh. The remaining cities had particularly low levels of retention amongst graduates originally from the surrounding region and beyond. Most likely, this highlights the different

characteristics, traditions and geographic location of universities as well as the size and buoyancy of city economies.

Greater London was distinctive with the highest rates of retention across all groups of graduates. So universities in London functioned as strong local ladders and magnets for students from the region & elsewhere. Retention of city-origin graduates was strong across all the cities. With the exception of Greater London, the retention rate amongst graduates from beyond the region, was weak. Most cities retained less than a quarter of the graduates from beyond their region. So they are strong local ladders, but relatively weak employment magnets. Edinburgh and Glasgow were slightly different in that they had a significant magnet effect upon their regional graduates.

Figure 6.2b The employment destination of graduates originally from the 'city'



Figures 6.2b, 6.2c & 6.2d consider the employment destination for graduates originally from the 'city', the 'region' and 'elsewhere' in turn. This will identify the contribution that each group of graduates made to each city's labour market as well as the overall labour market role of HEIs in each city.

From all three figures, it is clear that there is a strong tendency for graduates to return to their place of origin. Once again the only exceptions to this were Greater London and to a lesser extent, Greater Glasgow and Greater Edinburgh. These cities had the strongest pull effect upon graduates from all three categories. Greater London was particularly distinctive in that it was the only city to have had a magnet effect upon graduates who were from furthest afield i.e. from beyond the surrounding region. This highlights the 'city effect' which appears to have a bearing upon graduate retention. As commented upon earlier this itself is likely to be a result of the different characteristics, traditions and geographic location of universities as well as the size and buoyancy of city economies. The more concentrated nature of cities in the north of England may provide for a greater choice of employment destinations thereby containing the loss of graduates to areas beyond the region.

Figure 6.2c The employment destination of graduates originally from the surrounding region.

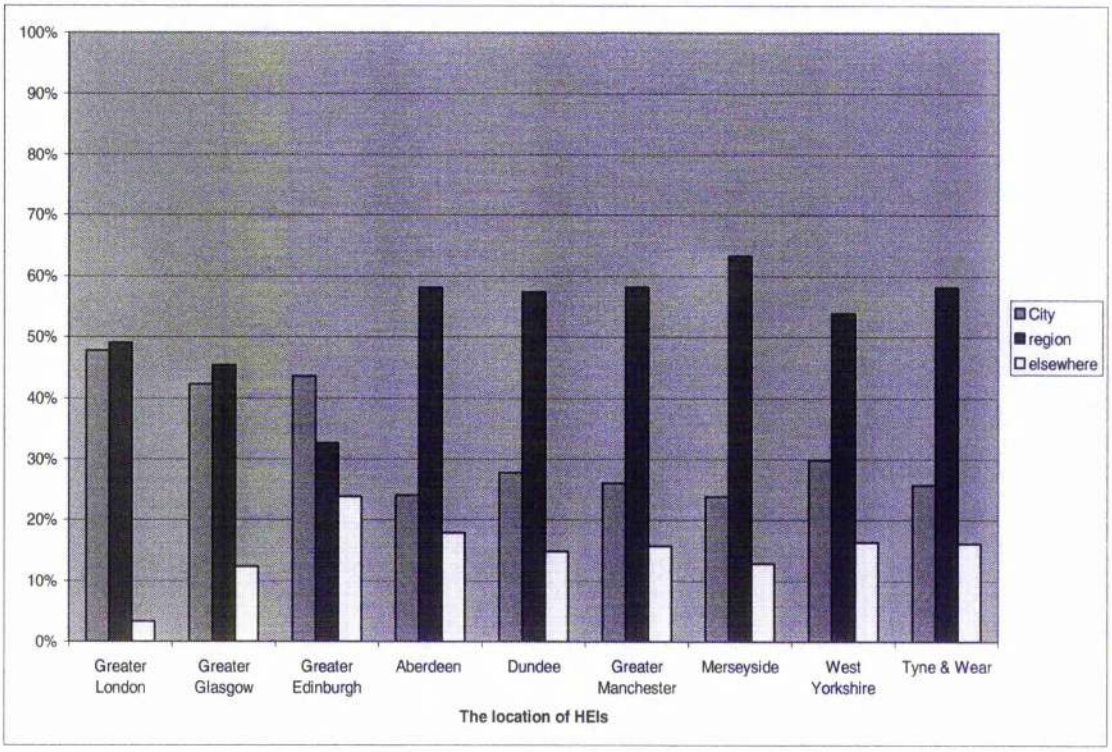
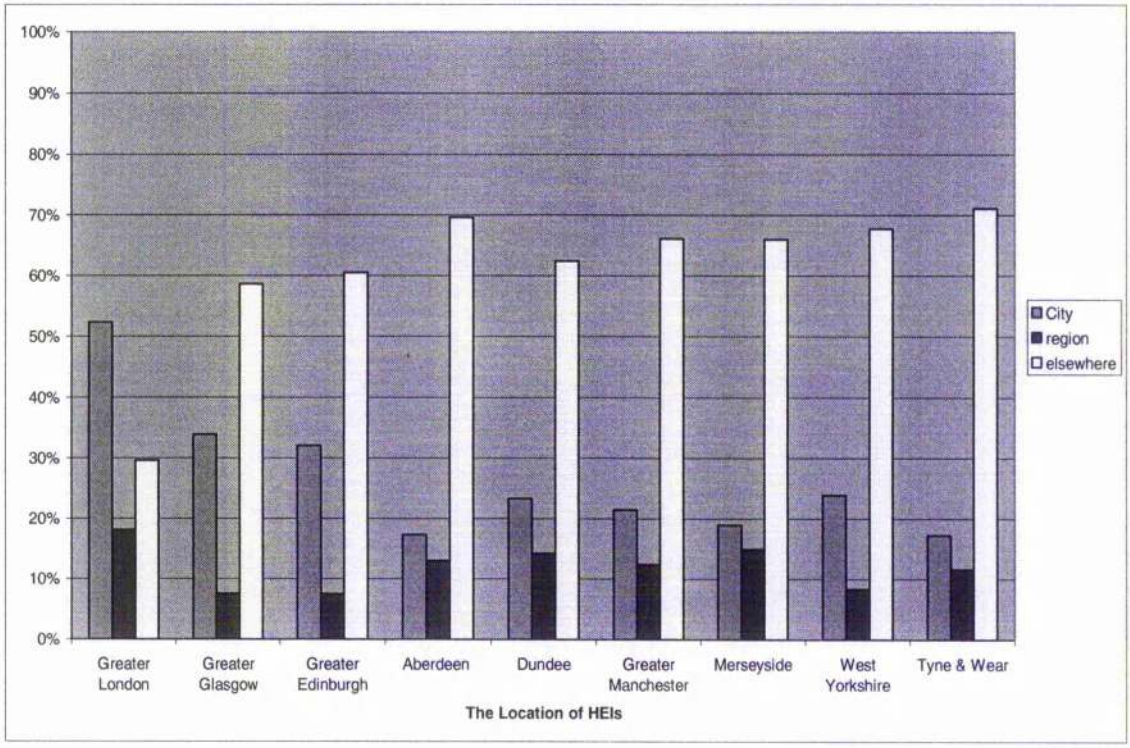


Figure 6.2d The final destination for external graduates that had studied in each city



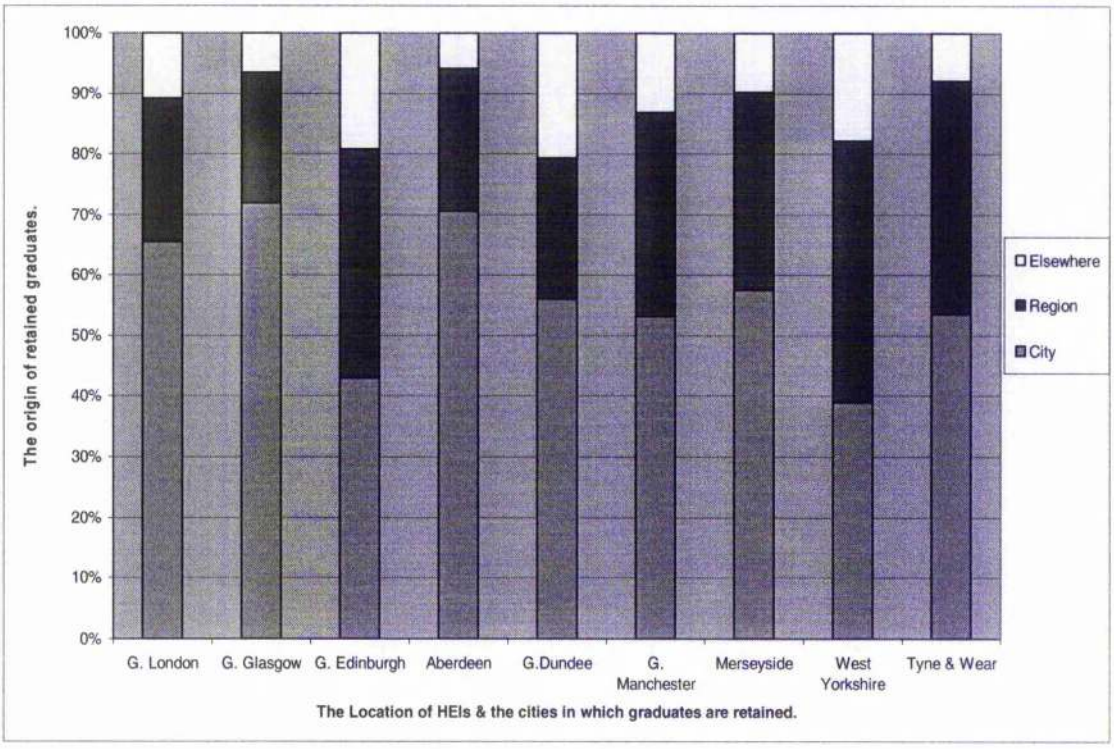
6.3 Characteristics of graduates retained within each city.

The aim of this section is to compare the characteristics of graduates retained in each city. Section 6.3.1 begins by comparing the origin of the graduates retained in each region. Section 6.3.2 considers the main activity for retained graduates. This enables some conclusions to be drawn about the nature in which universities and their graduates contribute to local labour markets. Section 6.3.3 compares retained graduates according to their occupational status. This gives some indication as to the extent of graduate underemployment in each city. Section 6.3.4 examines the main industries which employed graduates. This provides a general indicator for the economic dynamism of each city. Sections 6.3.5 and 6.3.6 consider the qualifications and subjects studied by the graduates retained in each city.

6.3.1 The origin of graduates retained in each city

At least two-thirds of the graduates that were retained in London, Glasgow and Aberdeen were originally from within the city. In contrast, the labour market contribution of graduates from areas outside the city was strongest in the labour markets of the remaining cities. This was especially the case for Edinburgh and West Yorkshire. Approximately two-fifths of the graduates retained in these cities were from within the city and the remainder were from the region and beyond. This highlights the importance of regional and external graduates to the labour markets in Edinburgh and West Yorkshire. Universities in these cities appear to be provide a stream of external graduates to refresh their local labour markets. The proportion of external graduates retained in Dundee was also amongst the highest. This suggests that external graduates had an especially significant role in the local labour markets of Dundee, Edinburgh and West Yorkshire. In contrast, Greater Glasgow, Aberdeen and Tyne & Wear had the lowest proportion of external graduates retained in the local labour market.

Figure 6.3.1 The origin of graduates retained for employment in each city



Once again, these contrasting findings highlight the different roles that university can have in local labour markets, which in turn, are likely to be a function of university traditions, culture, recruitment patterns as well as individual 'city effects' such as economic buoyancy and quality of life.

6.3.2 The main activity of graduates retained in each city.

Figure 6.3.2a The main activity of graduates retained in each city.

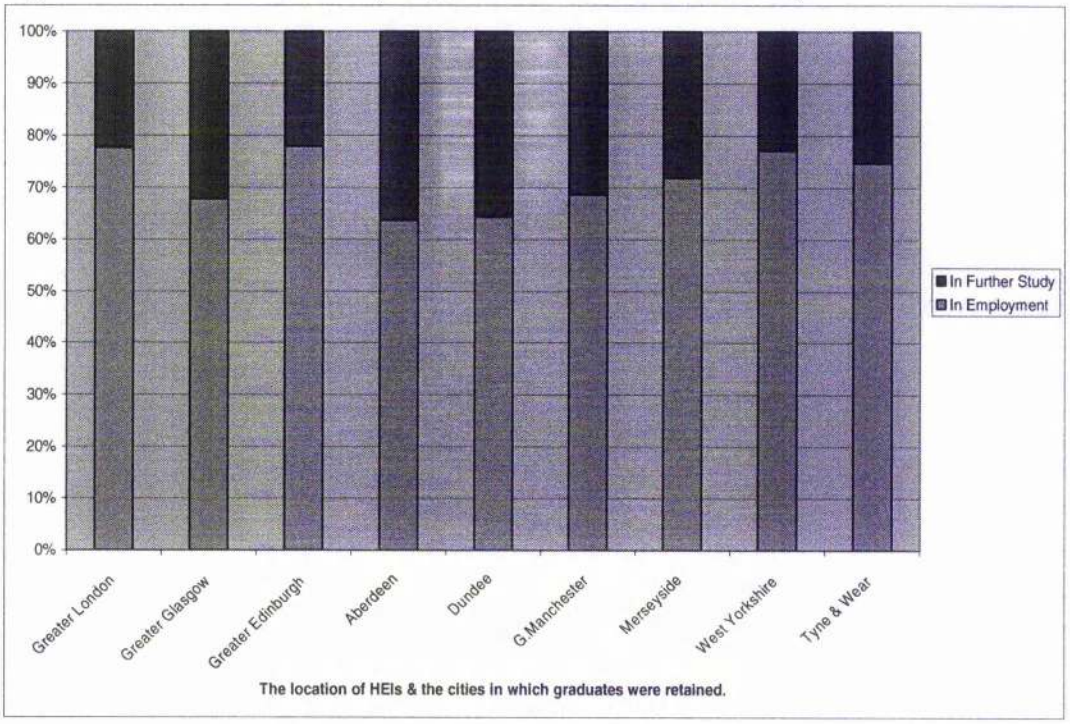
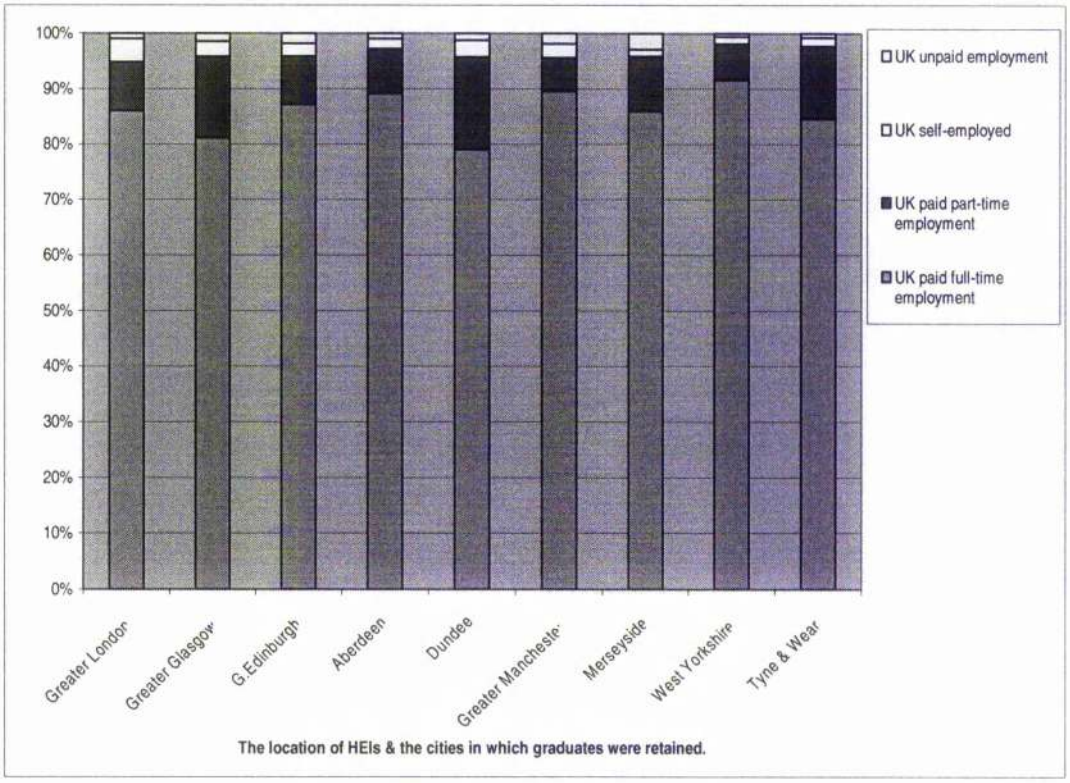


Figure 6.3.2a subdivides the graduates retained in each city, according to whether they were employed or continuing with further study. Figure 6.3.2a indicates that for all cities, at least sixty percent of all retained graduates were in employment. This indicates an overall productive contribution by graduates to their local economy. However, the cities with the highest graduate employment rates were Edinburgh and London followed by West Yorkshire. Over three quarters of the graduates that remained in these cities were in employment and less than a quarter were continuing into further study. Tyne & wear and Merseyside had just under three quarters of retained graduates in employment and slightly over one- quarter in further study. The cities with the lowest

proportion of graduates in employment were Greater Manchester, Greater Glasgow, Dundee and Aberdeen. In Aberdeen and Dundee, less than two-thirds of the retained graduates were in employment. It follows that these were relatively important places for further study. However, this finding could be an indication that, for a significant proportion of graduates, finding employment is difficult.

Figure 6.3.2b presents the type of work undertaken by employed graduates retained within each city. The majority of graduates in each city were in full-time paid employment (between 80% and 90%). Glasgow and Dundee had the lowest proportion of retained graduates in this category. Glasgow and Dundee also had amongst the highest proportion of retained graduates in part-time employment (approximately 15%). This shows a greater diversity in the type of employment undertaken by graduates retained in Glasgow and Dundee. Of more concern is that this finding may be indicative of a higher incidence of underemployment amongst graduates employed there.

Figure 6.3.2b Retained graduates and type of employment.

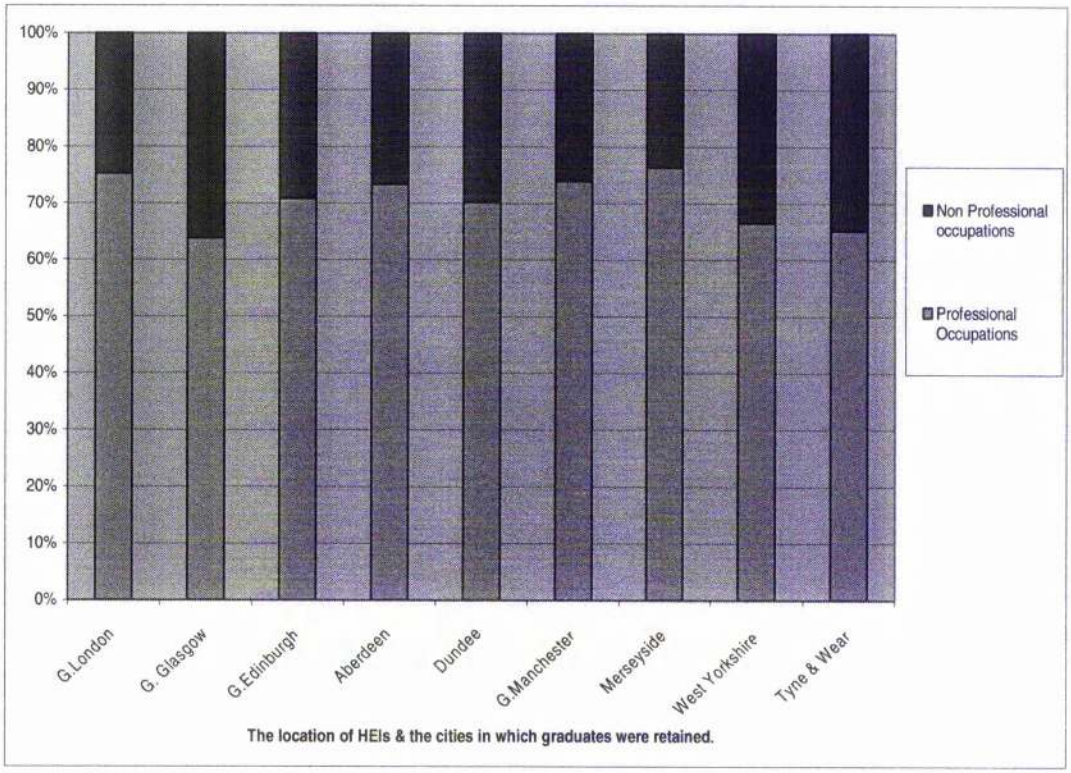


6.3.3 Retained Graduates and their occupation.

The aim of this section is to examine the type of occupation in which retained graduates were employed. This highlights variations across the cities and enable conclusions to be drawn relating to the quality of employment for graduates in each city.

Figure 6.3.3a presents the occupational status for graduates retained within each city. Occupational status has been divided into two broad categories: 'professional' and 'non-professional' (see Appendix G for details).

Figure 6.3.3a Retained Graduates and their Occupation.



Most graduates entered professional employment with modest variation between the cities (between 64% and 76% of all retained graduates). The likelihood of entering professional employment was highest amongst graduates retained in Greater London, Merseyside, Aberdeen and Manchester followed by Edinburgh and Dundee. Less than seventy percent of the graduates retained in Glasgow,

West Yorkshire and Tyne & Wear entered professional employment. This may reflect a higher incidence of *under-employment* in these cities, i.e. people in jobs that do not require graduate skills. This could be a consequence of relatively slack local labour market conditions. It may also reflect the qualifications and/or the quality of teaching and skills received by the graduates themselves. The latter is hard to gauge from the quantitive data alone, but at least from a detailed inspection of the HESA data, differences in the propensity to enter professional employment between the cities does not appear to be linked to differences between the subjects studied in each city.

Table 6.3.3 The Ratio of local to non-local graduates in professional and non-professional employment

City in which HEIs are located	Local origin graduates Ratio of professional to non-professional occupations	Non-local origin graduates Ratio of professional to non-professional occupations
G.London	2.9 : 1.0	3.4 : 1.0
G.Glasgow	1.8 : 1.0	1.6 : 1.0
G.Edinburgh	2.5 : 1.0	2.4 : 1.0
Aberdeen	2.5 : 1.0	3.5 : 1.0
Dundee	2.0 : 1.0	3.0 : 1.0
G.Manchester	3.0 : 1.0	2.6 : 1.0
Merseyside	2.8 : 1.0	4.1 : 1.0
W.Yorkshire	2.7 : 1.0	1.7 : 1.0
Tyne & Wear	1.8 : 1.0	2.0 : 1.0

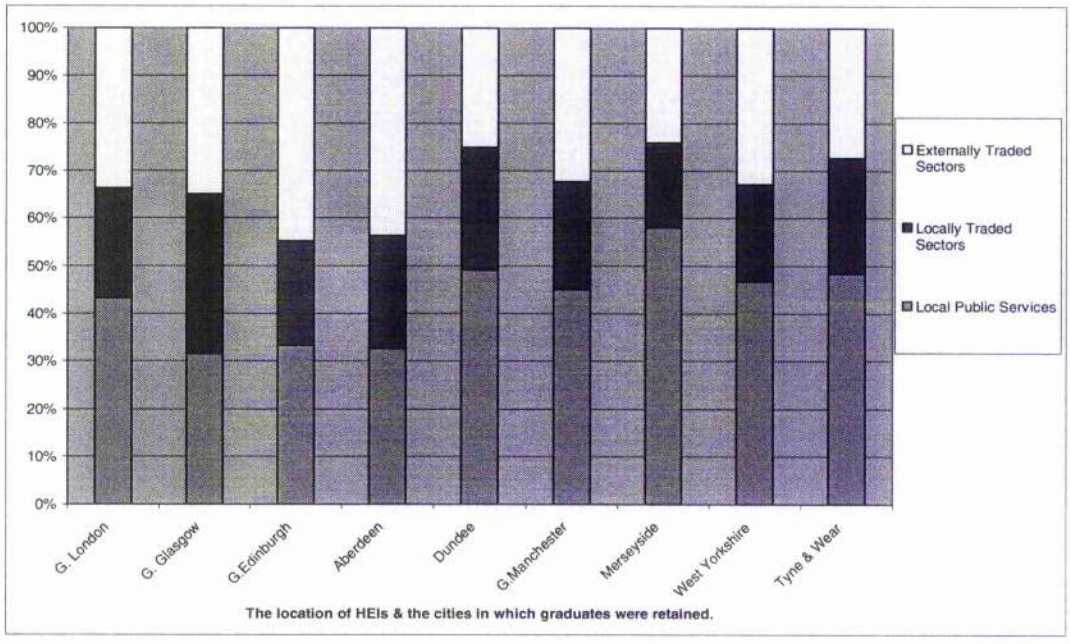
The ratios in Table 6.3.3 present some interesting findings. The ratios for London, Aberdeen, Dundee, Merseyside and Tyne & Wear indicate that non-local graduates may have secured 'better jobs' than local-origin graduates. In other words, the ratio of graduates in professional to non-professional employment was higher amongst retained external graduates than amongst retained local-origin graduates. In these cities, non-local graduates secured better jobs and therefore, can be said to contribute in a significant way to the local city-economy. In the remaining cities, the opposite was true, the ratio of graduates in professional to non-professional occupations was higher amongst retained local graduates than amongst the external graduates.

6.3.4 The Industries in which retained graduates were employed.

The aim of this section is to identify the main employers of graduates retained in each city. The industrial classifications have been grouped into three broad categories: the externally traded sectors, locally traded sectors and local public services (see appendix H for details). Cities in which a high proportion of graduates are employed in externally traded sectors may perhaps be considered to be the most competitive given that this branch of the economy is traditionally considered to be the most economically dynamic.

Figure 6.3.4 indicates that there were significant variations, across the cities in the proportion of graduates who were employed within the externally traded sectors and local public services especially.

Figure 6.3.4 Retained graduates and the industries in which they were employed.



Considering each sector in turn, it appears that the externally traded sector was the biggest employer of graduates in Greater Edinburgh and Aberdeen. Nearly half of the graduates retained in these two cities were employed by this sector. Greater Glasgow and Greater London followed with approximately one-third of

retained graduates entering this sector. Only about a quarter of the graduates retained in Dundee and Merseyside were employed within the externally traded sector. The results for these cities show a significant dependence on employment in public services. This was especially true in Merseyside where almost 60% of all retained graduates were employed in this sector. Greater Glasgow had the highest proportion of retained graduates employed in the locally traded sector (one third of all graduates). The proportion in all other cities was between one-fifth and one-quarter.

The findings seem to reflect the metropolitan functions of the cities to some extent (including health, public administration, finance, manufacturing and retail) but may suggest some strengths and weaknesses within the cities themselves. For example, the northern English cities, Merseyside especially, and Dundee were characterised by the importance of public sector jobs suggesting a weakness in the private sector labour market. In contrast, Glasgow, Edinburgh, Aberdeen and London had a more balanced profile with relatively strong employment in traded sectors as a whole. In particular, graduates retained in Edinburgh and Aberdeen were most likely to be employed in the externally traded sector, indicating the strength of this sector in these cities. Glasgow was much more diverse with a significant proportion of retained graduates finding employment in the locally traded sector. This is a point of interest given that this sector is represented by employment in typically non-graduate type employment (e.g. Consumer & personal services sector and a high proportion of non-professional part-time occupations). Once again, this may suggest some graduate underemployment in the city.

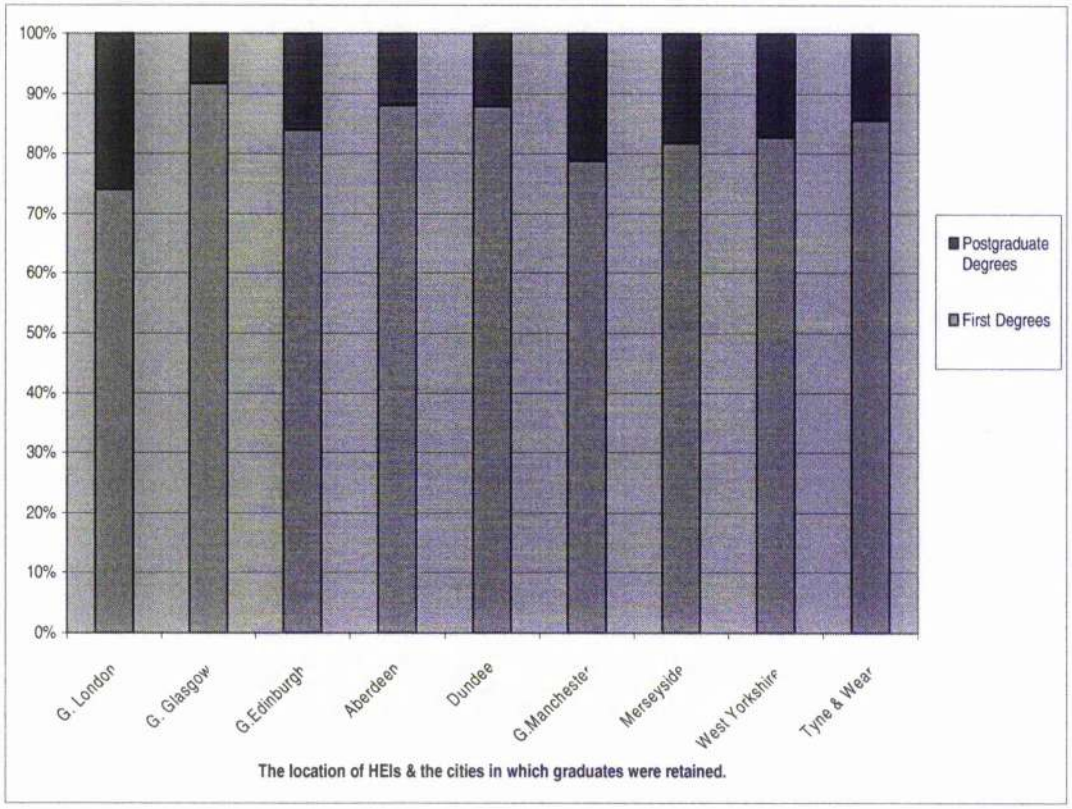
6.3.5 The type of Qualification held by retained graduates.

With the exception of Greater London and Greater Glasgow, there were modest variations in the qualification profile for graduates across the cities. Under this category and compared to Scottish cities, the English cities appear to have had a higher proportion of postgraduates amongst graduates retained for employment. The cities with the highest proportion of postgraduates were: London (over one-quarter of retained graduates had a postgraduate qualification), followed by

Greater Manchester (just over one-fifth of those retained had a postgraduate degree). Just under one-fifth of the graduates retained in Merseyside, West Yorkshire, Edinburgh and Tyne & wear were postgraduates. Less than one-tenth of the graduates retained in Glasgow had a postgraduate qualification.

So in terms of the skill-levels amongst retained graduates, Greater London had the highest followed by Manchester. Greater Glasgow, Dundee and Aberdeen had the lowest level of postgraduate skills perhaps reflecting fewer employment opportunities for those with advanced degrees.

Figure 6.3.5 Retained graduates and their qualifications

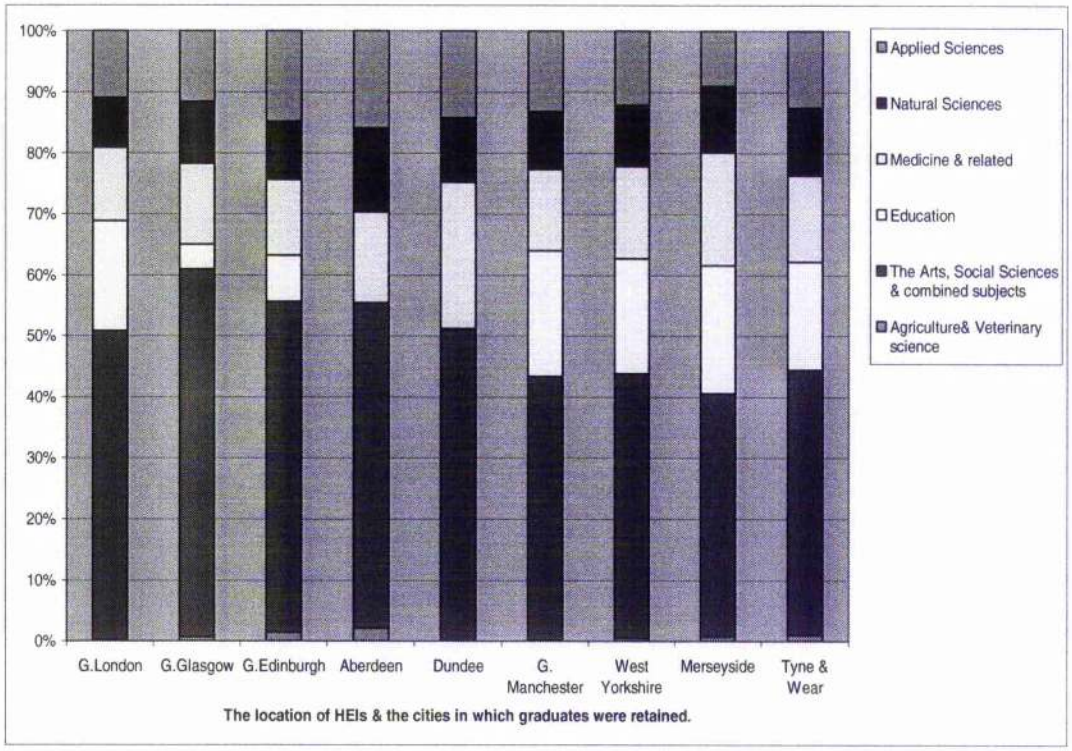


6.3.6 Retained Graduates and Subjects studied.

This section presents the graduates retained within each city according to the subjects they had studied.

Aberdeen had the highest proportion of Science graduates amongst those retained suggesting favourable employment opportunities for this group in the city (reflective of the petroleum industry). The Scottish cities had a particularly high proportion of Arts graduates amongst those retained. London had a relatively balanced profile whilst the northern English cities were characterised by an especially high proportion of Medical and Education graduates reflecting the dominance of public sector employment in these cities.

Figure 6.3.6 The subjects studied by graduates retained in each city



6.4 Graduate brain Drain / Gain at city level.

Figure 6.4 Graduate Brain Drain/Gain at city level.

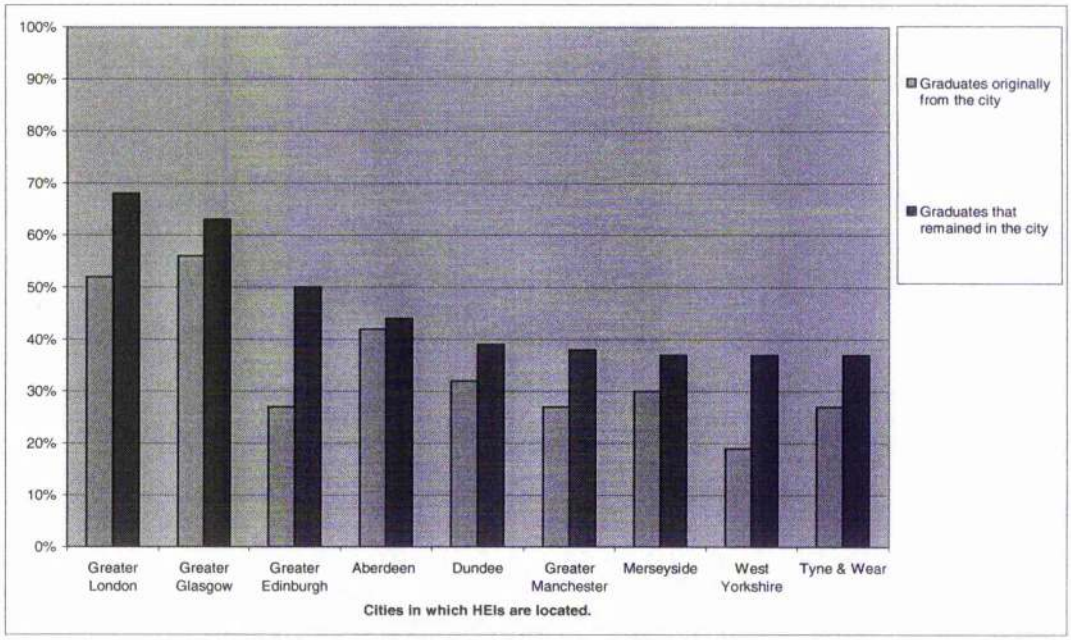


Figure 6.4 presents the proportion of graduates originally from each city and the subsequent proportion of graduates that remained in each city for employment. The proportion of graduates originally from each city varied considerably. Over half of the graduates that had studied in London and Glasgow came from within the cities themselves. In the remaining cities, less than half of all graduates came from within the cities themselves. In particular, HEIs in Edinburgh and West Yorkshire had the least proportion of graduates from within the city area.

Figure 6.4 indicates that all cities had experienced an overall brain-gain in graduates. This is a positive outcome for all the cities concerned. This finding indicates that HEIs in each city have performed a positive labour market role in channelling additional skilled labour into local labour markets. The net gain or brain-gain in graduates was particularly strong in Edinburgh and West Yorkshire and weakest in Aberdeen, Glasgow and Merseyside.

Table 6.4 overleaf, quantifies the brain-gain in cities. For each city, columns E & F presents the net effect from city graduates that left, and external graduates that remained. The local ladder effect can be gauged from column C. In Dundee and Merseyside, approximately three in every ten of the city-origin graduates left for employment outside of the city. In the remaining cities, approximately two in every ten of the city-origin graduates left the city for employment. Column D presents the proportion of all external graduates (i.e. graduates that were not from within the city) who remained within each city for employment. This can be interpreted as the *employment magnet* effect upon external graduates. Nearly half of all external graduates remained in London for employment and around two-fifths of external graduates remained in Glasgow and Edinburgh for employment. The remaining cities had significantly lower levels of retention amongst external graduates (between 22% and 28%). This was especially the case in Aberdeen and Merseyside. The net effects of these flows are presented in absolute terms in column E and in proportion to the number of graduates originally from the city, in column F. Thus, the cities which had the largest proportional brain-gains were: West Yorkshire and Greater Edinburgh. Both of these cities almost doubled the size of their local graduate population through the retention of external graduates. This indicates the importance of external graduates to the labour markets in both West Yorkshire and Edinburgh. The remaining cities had experienced considerably smaller brain-gains. Tyne & Wear experienced a brain gain of 39%. This was followed by London which had a brain gain of 31%. Greater Dundee and Merseyside had similar brain-gains of 23% and 24% respectively. Greater Manchester and Glasgow each had brain-gains of 12%. The city with the least brain-gain was Aberdeen which increased its local population of graduates by 6% only.

Table 6.4. The brain-gain in graduates across cities.

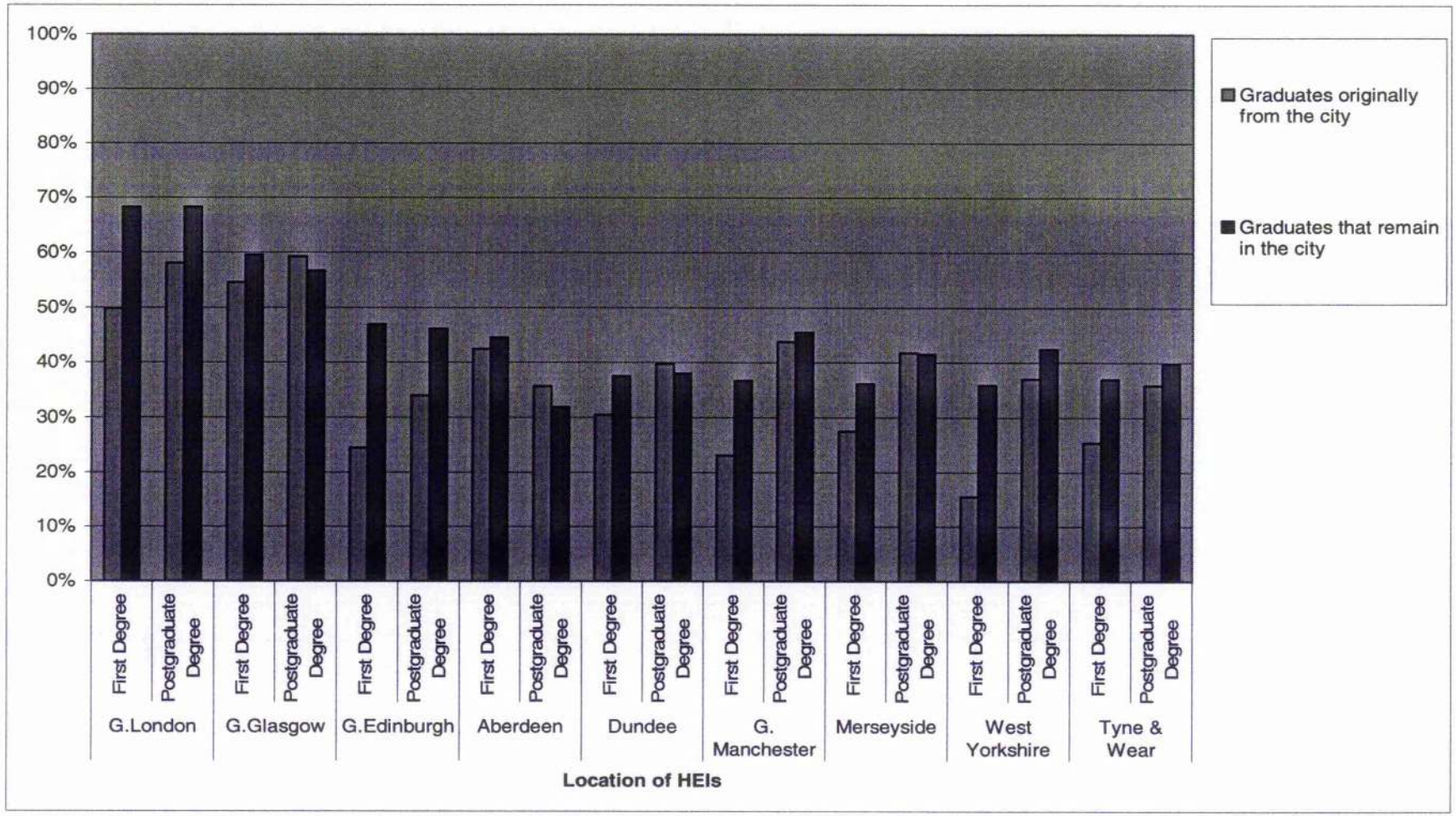
	A	B	C	D	E	F
City in which HEIs are located	Total Number of Graduates	Graduates originally from the city (as a % of A)	City-origin graduates that left the city (as a % of B)	External graduates that remained in the city (as a % of all non-locals)	Scale of Net Change (D-C)	Net Change as a % of B
G. London	41481	21543 (52%)	3014 (14%)	9776 (49%)	6762	31%
G.Glasgow	7512	4213 (56%)	833 (20%)	1318 (40%)	485	12%
G. Edinburgh	9806	2556 (27%)	571 (21%)	2777 (39%)	2206	83%
Aberdeen	4206	1754 (42%)	444 (25%)	546 (22%)	102	6%
G. Dundee	2700	863 (32%)	268 (31%)	468 (25%)	200	23%
G. Manchester	15212	4078 (27%)	976 (24%)	2730 (25%)	1754	12%
Merseyside	10271	3064 (30%)	875 (29%)	1620 (22%)	745	24%
West Yorkshire	12656	2371 (19%)	556 (23%)	2855 (28%)	2299	97%
Tyne & Wear	13511	3628 (27%)	923 (25%)	2347 (24%)	1424	39%

6.4.1 Graduate Brain gain in cities and level of qualification.

Figure 6 .4.1 overleaf, indicates that the brain gain of graduates in cities occurred across both levels of qualification. The only exceptions to this were the cities of Glasgow, Aberdeen, Dundee and Merseyside. These cities had experienced brain-gains amongst first degree graduates but a brain-drain in postgraduates.

Tables 6.4.1a to 6.4.1i (in appendix J) show a stronger brain-gain across graduates with first degrees, than graduates with second degrees. This suggests that postgraduates are more mobile than first-degree graduates and therefore more likely to have left the city in which they had studied. From the tables in appendix J, universities in each city had functioned as local ladders for both first-degree graduates and for postgraduates. However, this effect was weaker amongst the postgraduates who were marginally more likely to leave their origins. In addition, all the cities except for Greater London (and to a lesser extent Edinburgh and Glasgow), had functioned as temporary training grounds for external first degree graduates and postgraduates. Between 22% and 28% of all external first-degree graduates remained in the northern English cities for employment, and between 24% and 28% of external postgraduates remained in the northern English cities for employment. In Aberdeen and Dundee, the temporary training ground effect was even stronger with less than 10% of all external first-degree graduates and under one-quarter of postgraduates, choosing to remain in the two cities for employment. Greater London was the only city to have had any significant employment magnet effect upon external graduates. Half of all first degree graduates remained in London for employment and slightly under a half of all external postgraduates remained in London. In Edinburgh, nearly half of all external first-degree graduates remained for employment and just over one-third of external postgraduates remained for employment. In Glasgow, just under two-fifths of all external first degree graduates remained for employment and just under one-third of external postgraduates remained for employment. Thus the northern English cities, Aberdeen and Dundee had the greatest temporary training ground effect upon all external graduates.

Figure 6.4.1 Graduate Brain Gain / Drain from cities and level of qualification.



6.4.2 Subject area and graduate brain drain/gain at city level.

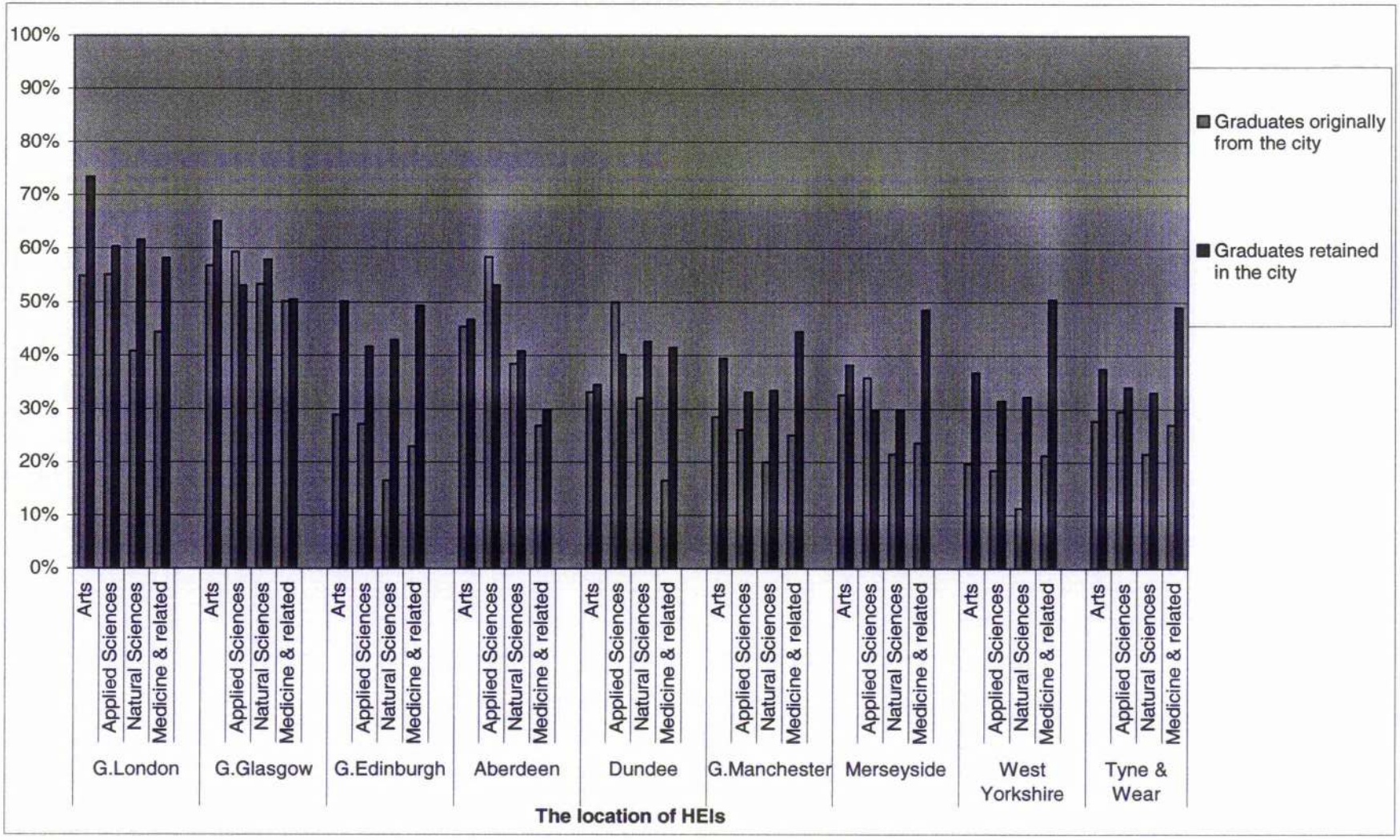
The aim of this section is to identify the subjects in which there was a brain-drain of graduates from cities. For each city, figure 6.4.2a overleaf presents the origin and the employment destination for graduates in each subject area. As well as providing a description of the student intake and retention in each discipline, this provides a preliminary indication of the subject areas in which there was a brain-drain and/or brain-gain.

From figure 6.4.2a (overleaf), Glasgow appears to have had the most locally oriented intake of students. For HEIs in Glasgow, over half of all the graduates in each subject area were from within the city. In London, over half of the Arts & Applied Science graduates were from within the city. In Aberdeen, over half of all the Applied Science graduates were from within the city. In all the remaining cities, the majority of graduates in each subject area were from outside of the city.

Figure 6.4.2a indicates that generally, cities had experienced brain-gains in all subject areas. The only exceptions to this were: Glasgow, Aberdeen, Dundee and Merseyside which experienced a brain drain in Applied Science graduates.

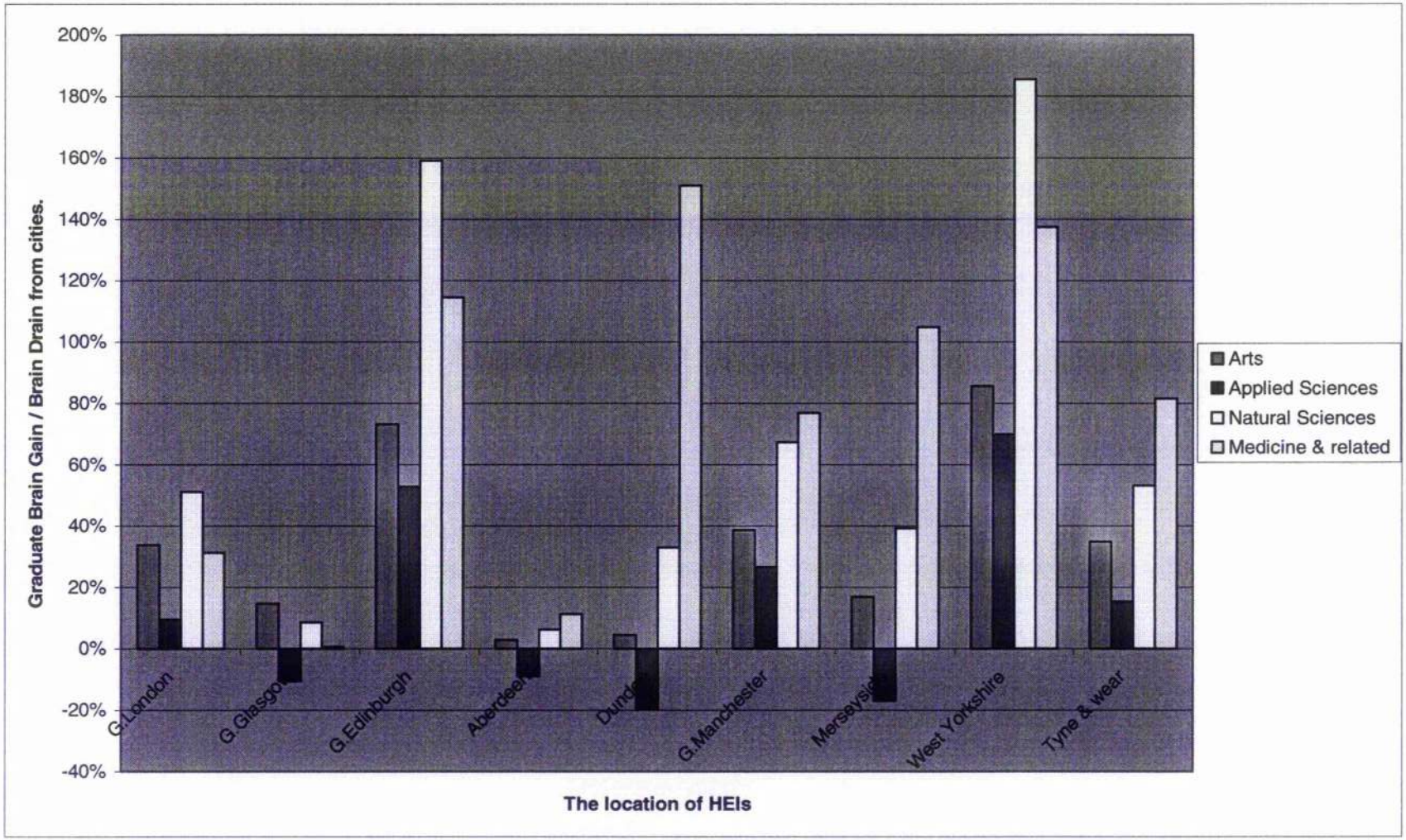
For each city, figure 6.4.2b (refer to page 107) quantifies the size of the brain-gain or brain-drain for each subject area. This is done by calculating the net loss/gain of graduates in each subject category as a percentage of the total number of city-origin graduates. Clearly, West Yorkshire and Edinburgh had particularly strong net gains in graduates in all the subject groups. All the northern cities were characterised by strong net gains in Medical graduates. Glasgow and Aberdeen experienced the smallest net gains in graduates. Glasgow, Aberdeen, Dundee and Merseyside were the only cities to have experienced a net loss in Applied Science graduates.

Figure 6.4.2a Subject area and graduate brain drain/gain at city level.



n.b. Refer to appendix F for a detailed breakdown of each subject grouping.

Figure 6.4.2b Graduate brain-drain/gain in each subject area.



Thus in net terms, Edinburgh, Dundee and the cities in the north of England benefited from large net gains in graduates remaining within the city for employment. Therefore, universities in these regional cities had a significant role in channelling non-local graduate skills directly into local labour markets. In comparison, the net gains experienced by Aberdeen, Glasgow and London were more modest. These cities had larger local graduate populations and as a result, their net gains were smaller and the role of non-local graduates in local labour markets was less prominent. This highlights the different characteristics of the universities across the cities.

Figure 6.4.2c overleaf, presents the *spring-board* effect of universities in each city. In other words, the diagram presents the proportion of local-origin graduates who left each city for employment elsewhere. For all cities, less than half of all local graduates in each subject area left, confirming the strong local-ladder effect of HEIs. However, some cities appear to have had a significant springboard effect in some subject areas. The effect was particularly strong amongst local-origin medicine graduates from Aberdeen, nearly half of whom left their city. Similarly, approximately two-fifths of local medicine graduates from Dundee also left the city. In Merseyside, approximately two-fifths of local Applied Science graduates left the city. Generally, in Glasgow and the northern English cities, the springboard function of HEIs was particularly prevalent amongst the local Applied Science graduates. Overall, this effect was weakest amongst the local Arts graduates. Finally, the springboard effect was weakest in Greater London whose HEIs did not function as a conduit to other destinations for their population of local students, but rather retained them. With the exception of Applied Science graduates, the overall limited variation between cities suggest that the issue for cities is not to try and hold onto their local graduates but rather, to try and attract and retain more non-local graduates.

Figure 6.4.2c The Spring-board effect of universities in each city

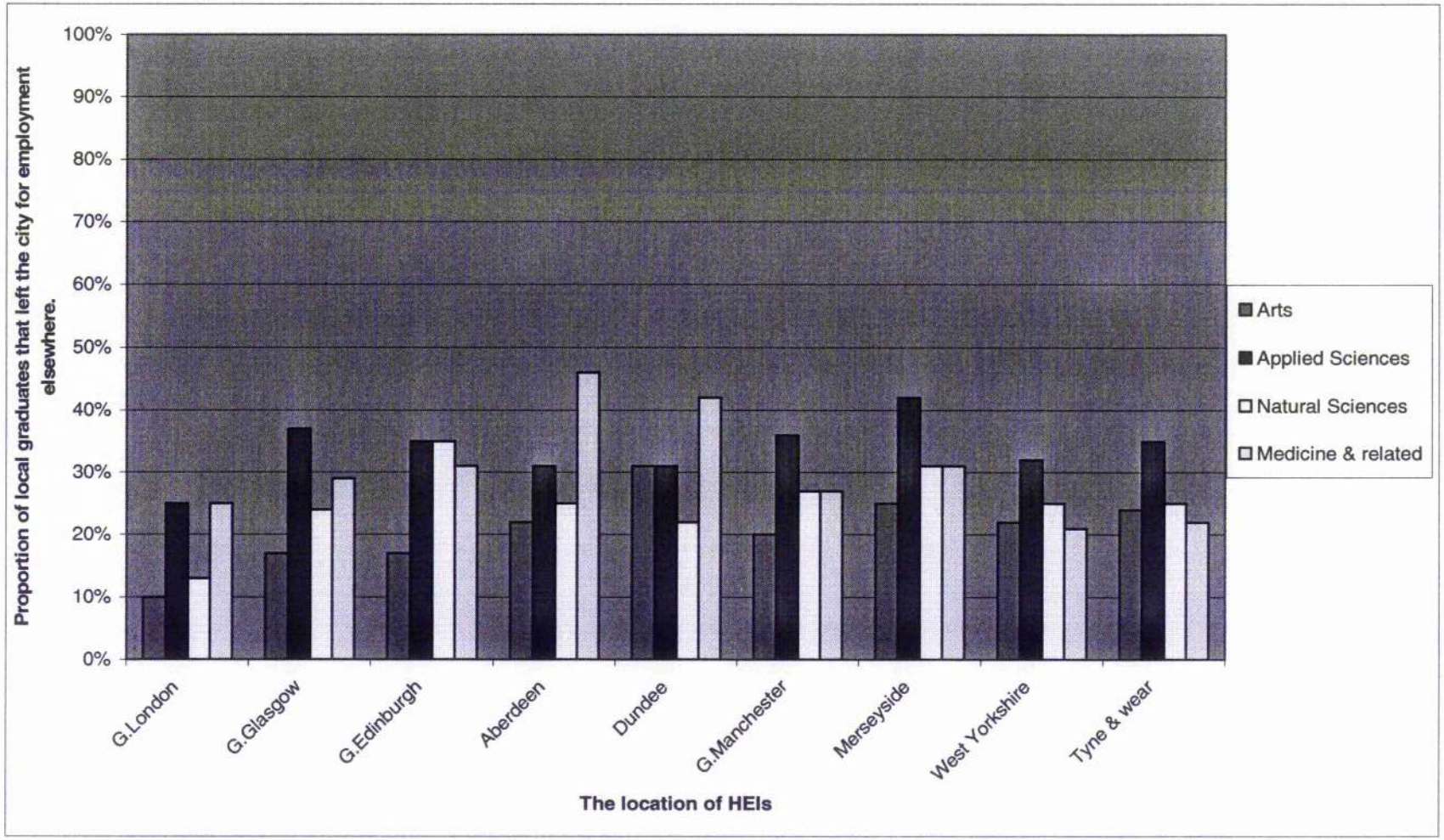


Figure 6.4.2d The employment magnet effect in cities

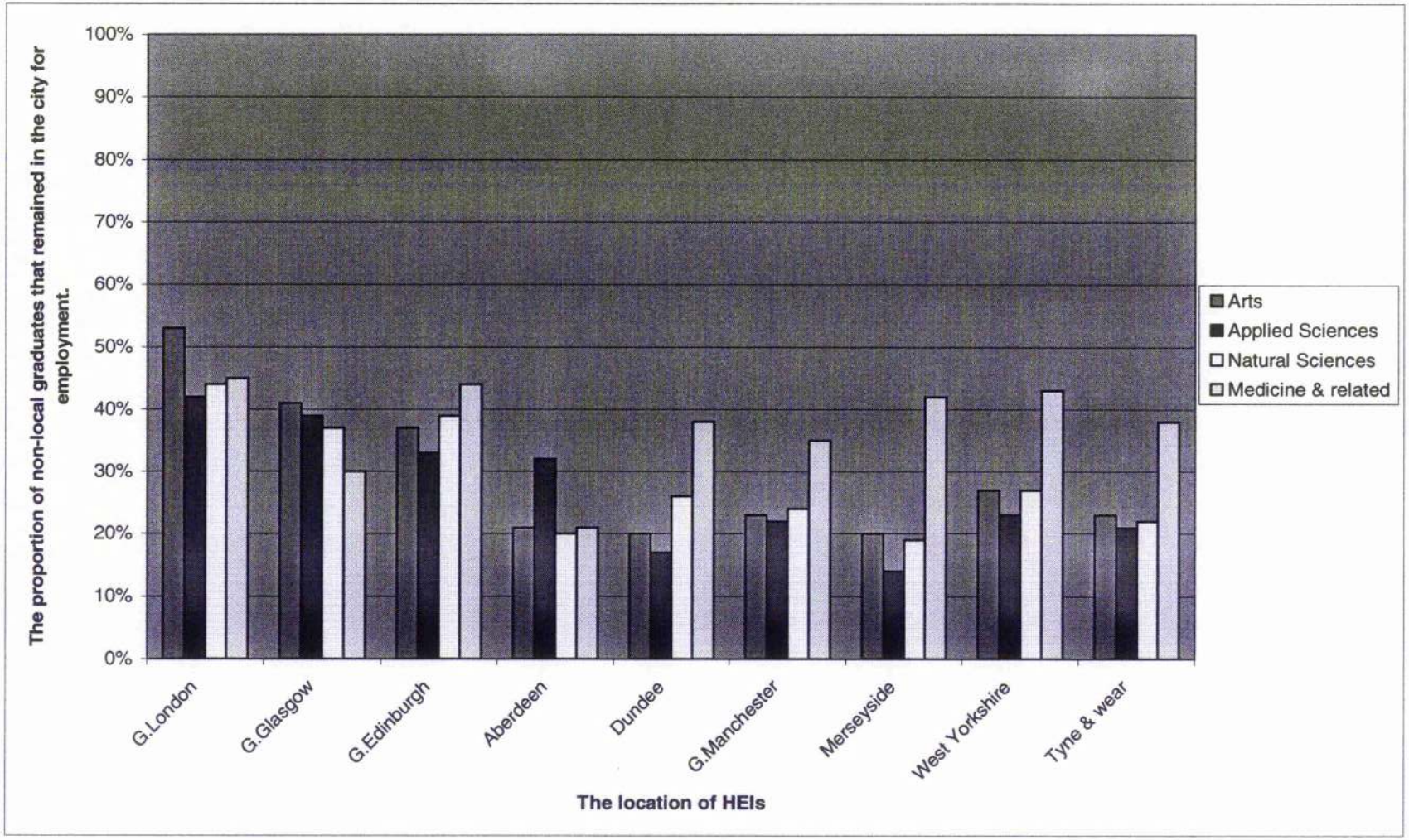


Figure 6.4.2d (refer to page 110) considers the extent to which universities in each city functioned as employment magnets for external graduates in each subject area. The figure presents the proportion of external students that remained within each city for employment after graduating. Greater London was the only city to have functioned unambiguously as an employment magnet for external Arts graduates, over half of whom remained for employment. The employment magnet effect in Greater London was weaker across the remaining subject groups, functioning more as temporary training grounds for these remaining graduates (just over 40% of these graduates were retained for employment). In the remaining regional cities, universities had functioned as temporary training grounds for the majority of external graduates in each subject group. In the northern English cities and in Dundee, the temporary training ground effect was weakest for Medicine graduates. Between one third and just under half of all external Medicine graduates in these cities remained for employment. For these cities and in subjects other than Medicine, less than one-third of external graduates remained for employment. However, Greater Edinburgh and Greater Glasgow were significantly different from the other regional cities. After London, Edinburgh and Glasgow had the strongest retention effects upon external graduates. In Glasgow approximately 40% of external graduates in the Arts, Applied Sciences and Natural Sciences, remained for employment, and 30% of external Medicine graduates remained. In Edinburgh, over 40% of external Medicine graduates remained for employment; and just under 40% of external Natural Science and Arts graduates remained, and one-third of external Applied Science graduates remained.

6.4.3 Graduate Brain-gain / drain from old & new universities.

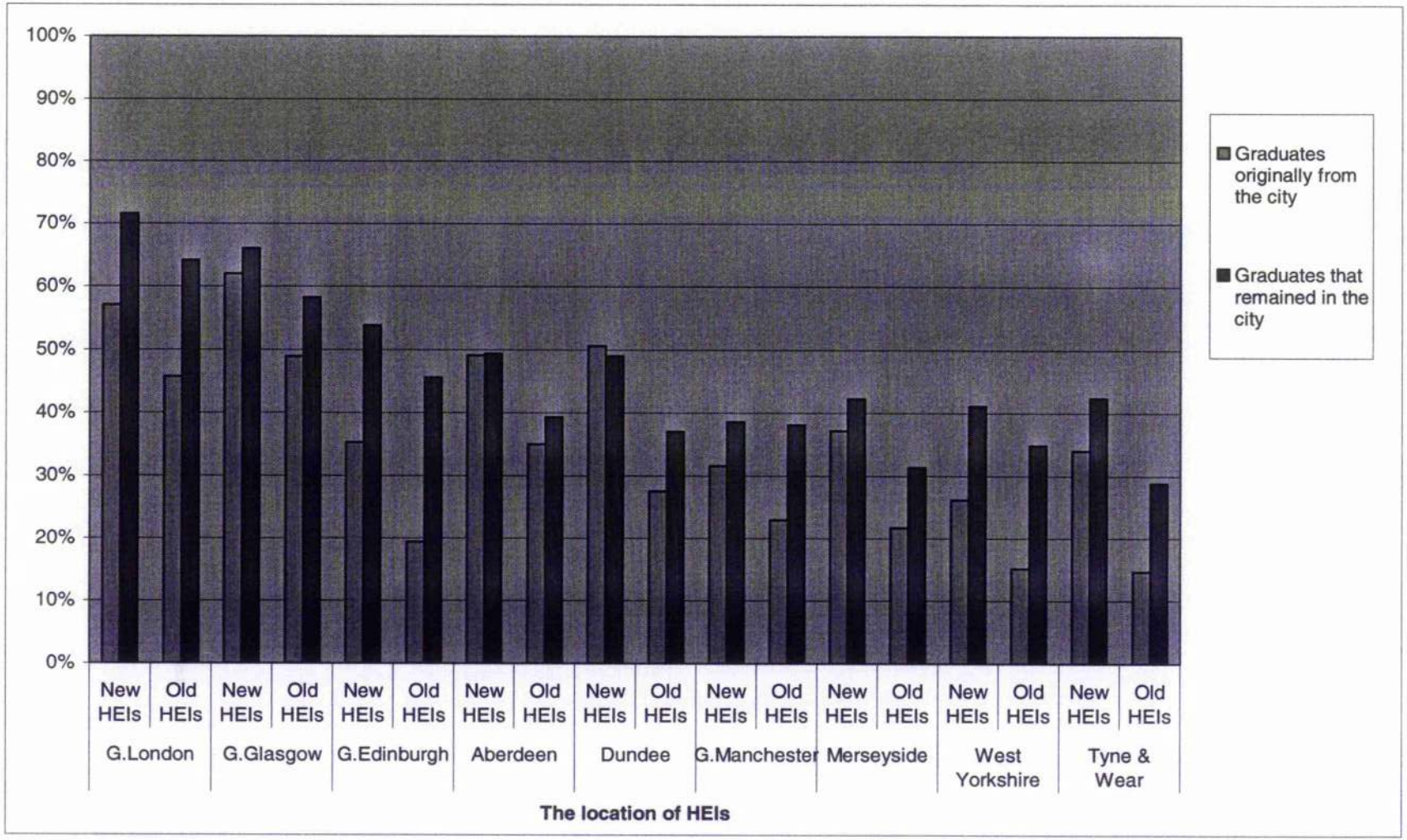
This section examines patterns of graduate origin and destination for different types of HEI located in each city. HEIs have been differentiated according to their pre 1992 status. Therefore older HEIs are those institutions which had university status before 1992 and newer HEIs are those institutions which received university status after 1992.

As may be expected from figure 6.4.3a (overleaf), it is clear that the newer universities had a higher intake of local students and a higher rate of gross retention. This implies that older universities functioned to a greater extent as temporary training grounds. However, for the northern English cities, both types of universities functioned as temporary training grounds overall, although the effect was stronger amongst older institutions. The new universities in Glasgow and London were particularly strong local-ladders.

Figure 6.4.3b (on page 115), confirms that overall, both old and new universities functioned predominantly as *local-ladders* rather than *spring-boards* (to other locations) for their population of local young people. In other words, after receiving their university education, the majority of locals remained for employment within the city in which they had studied. The only significant exceptions to this were the graduates from older universities in the cities of Dundee, Merseyside and Tyne & Wear. Nearly two-fifths of all local-origin graduates that had attended these HEIs subsequently left for employment elsewhere i.e. the HEIs in these cities had a significant *spring-board* effect for local young people. In general, it appears that local-origin graduates were more mobile if they had attended an older university.

From figure 6.4.3c (on page 116), it is clear that Aberdeen, Dundee and all the northern English cities functioned unambiguously as temporary training grounds for all external graduates. Less than one-third of all external graduates, at both types of university, actually remained within the city for employment afterwards. Greater London was the closest to an employment magnet. In London, just under half of all the external graduates from both types of university, remained for employment. Although Glasgow and Edinburgh functioned as overall temporary training grounds for external graduates, the results for these two cities were significant. They had far stronger performances than the other regional cities. For both Glasgow and Edinburgh, approximately

Figure 6.4.3a The origin and destination of graduates from old and new HEIs located in each city.



40% of all externals, graduating from both old and new HEIs, remained in each city for employment afterwards. Unlike the rates of retention for local-graduates, there was minimal differences in the rates of retention for external graduates in old and new HEIs.

Figure 6.4.3d (on page 117) presents the results of the brain-gain and brain-drain analysis for each city. Under this category, Edinburgh, West Yorkshire, London and all the remaining northern English cities performed well. All of these cities experienced substantial brain-gains which were especially strong amongst the older universities. In particular, Greater Edinburgh and West Yorkshire experienced the most substantial brain-gains, particularly across the older universities. In contrast, cities such as Aberdeen, Glasgow and Dundee had modest brain-gains. The latter also experienced a brain-drain from new institutions.

The interpretation of the findings for brain gain/drain is not straightforward. First and foremost, the overall brain-gain in cities is a positive outcome since it implies that cities did not lose more graduates than they had gained. In other words, there was a net gain in graduates remaining for employment in these cities. This is a positive outcome for all the cities concerned, especially those of a more peripheral nature since the picture that is often painted of these cities is a bleak one in terms of graduate loss (see DTI, 2001). This reflects the failure to take into account the origin of the graduates in the first place and the different student recruitment patterns in different parts of the country. The graduate brain-gain in cities also highlights the broadly positive labour market function for universities within cities i.e. training and retaining the majority of the local population for employment, as well as introducing external graduates into local labour markets.

Figure 6.4.3b The proportion of local-origin graduates that left for employment elsewhere, according to the type of university attended

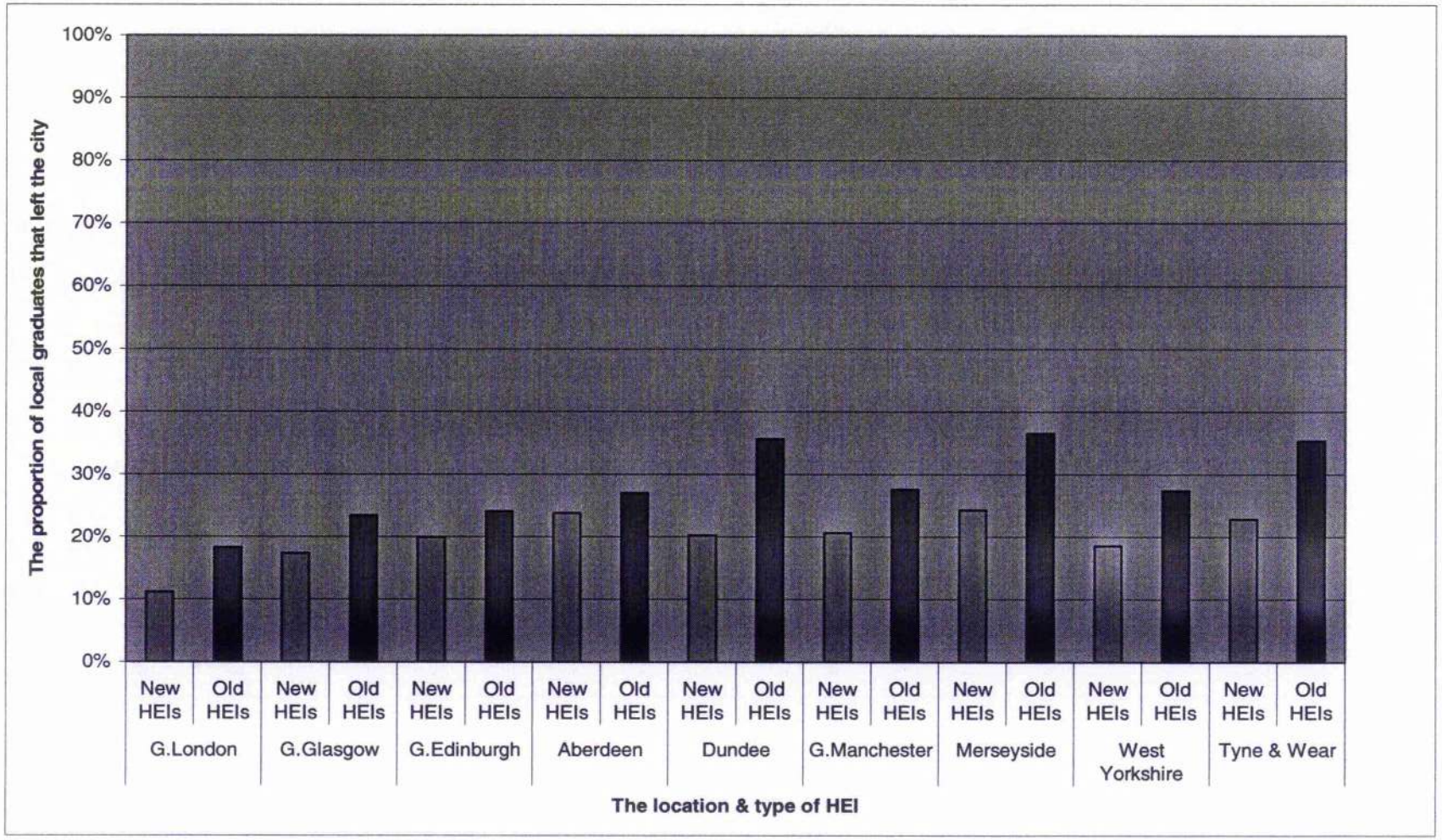


Figure 6.4.3c The proportion of non-local graduates that remained for employment, according to the type of university attended

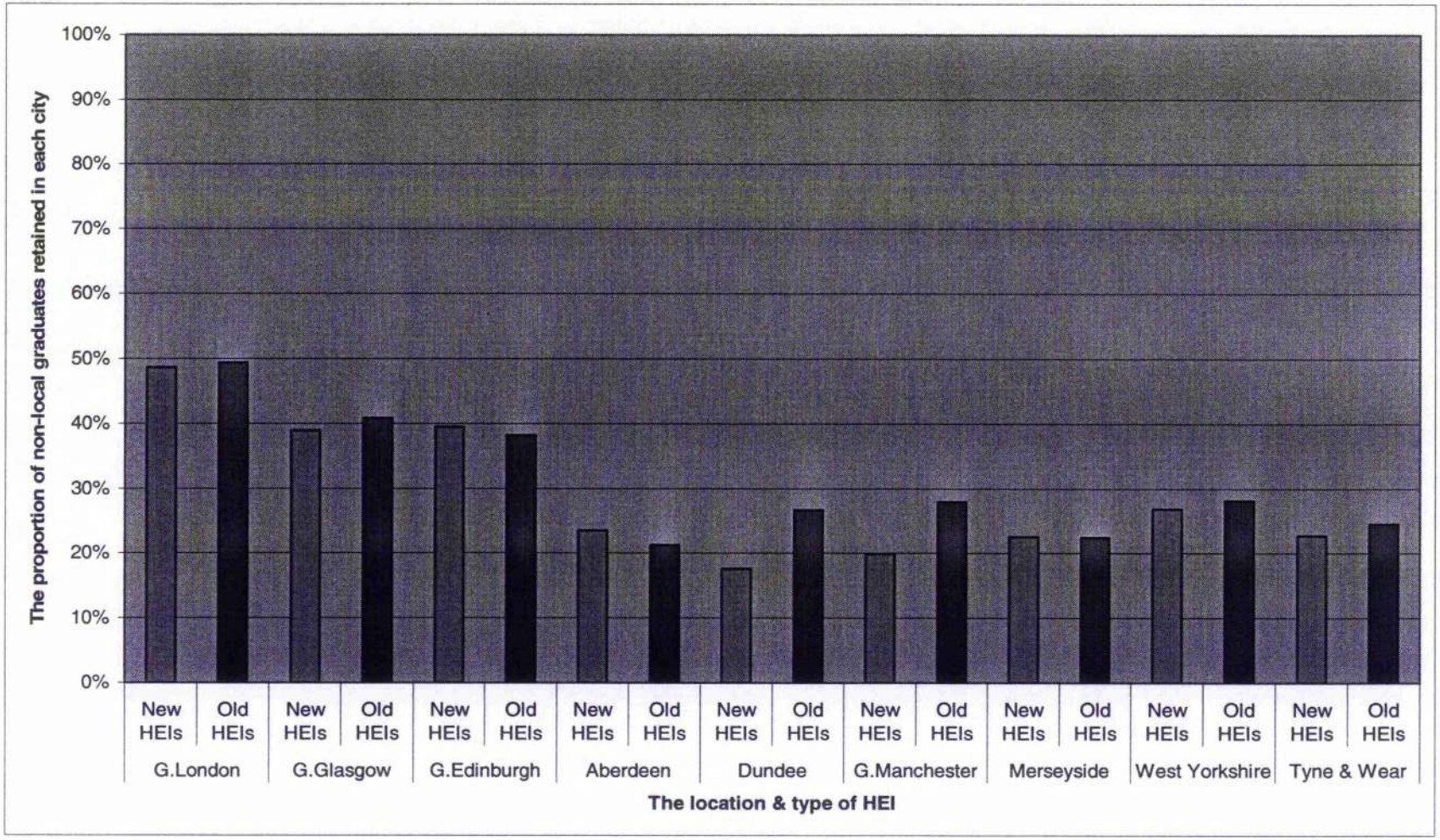
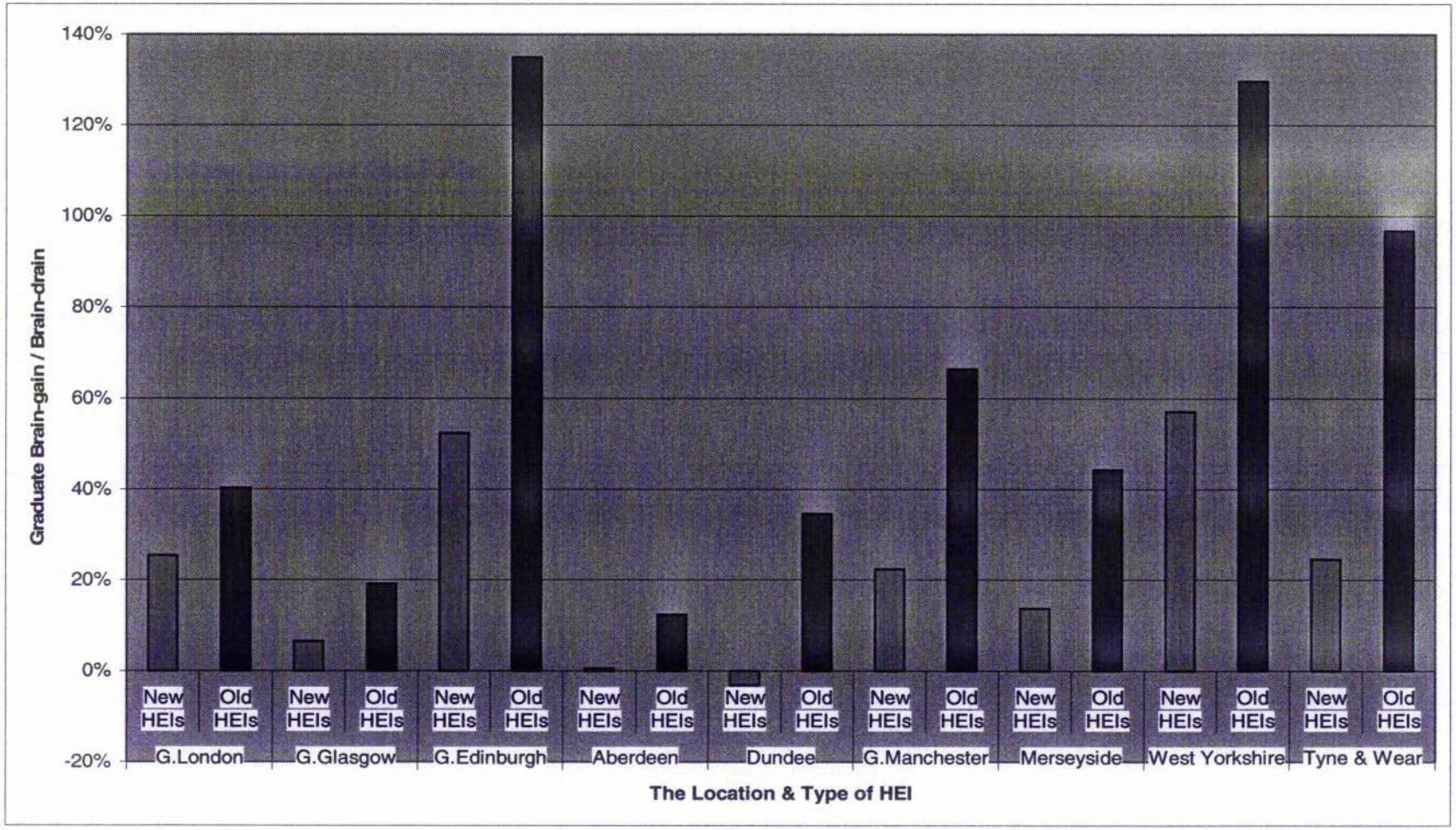


Figure 6.4.3d Graduate Brain-gain from HEIs



Brain-gains were more substantial across the older universities in both proportional and absolute terms (see tables 6.4.3a & 6.4.3b overleaf). This is essentially because older universities had a larger external graduate population. Brain-gains were also stronger in cities which had a larger external graduate population too. Therefore, it would be misguided to compare cities solely on the figure for brain-gain. The figure for brain-gain is useful in highlighting the net gain or loss in local graduates as well as highlighting the role of external graduates in local labour markets. However, it is also necessary to consider the nature of the HEIs in each city and the gross rates of retention for a better comparison of cities.

Overall, this section has highlighted a number of significant points. Older universities are routes through which local graduates are more likely to leave their origins whereas; the newer universities are more likely to have retained them. The figures for overall gross retention identified both old and new universities in the north of England in particular, as having retained less than half of all graduates for employment there. Overall, the gross retention of graduates was higher in the new universities. Gross retention figures were highest in London and Glasgow, followed by Edinburgh. For each city, both types of university functioned as strong local ladders although this function was stronger in the new universities. The older universities in Dundee, Merseyside and Tyne & Wear were the most prominent HEIs through which a significant proportion of local-graduates left the city. In terms of the retention of external graduates, both old and new universities in Greater London were the closest to an employment magnet. Both old and new universities in cities in the north of England, Aberdeen and Dundee functioned as temporary training grounds. Greater Glasgow and Edinburgh had similar rates of retention amongst external graduates which were the strongest amongst the more peripheral cities.

Table 6.4.3a Graduate Brain-gain in new HEIs

	A	B	C	D	E	F
City	Total Number of Graduates	Local graduates originally from the city (as a % of A)	Local graduates that left the city (as a % of B)	Retention of Graduates from beyond the city (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
G.London	22575	12892 (57%)	1434 (11%)	4709 (49%)	3275	25%
G.Glasgow	4107	2548 (62%)	442 (17%)	607 (39%)	165	6%
G.Edinburgh	4688	1656 (35%)	330 (20%)	1198 (40%)	868	52%
Aberdeen	1924	945 (49%)	225 (24%)	230 (23%)	5	1%
Dundee	508	257 (51%)	52 (20%)	44 (18%)	-8	-3%
G.Manchester	6864	2166 (32%)	448 (21%)	932 (20%)	484	22%
Merseyside	5408	2009 (37%)	489 (24%)	766 (23%)	277	14%
West Yorkshire	4086	1070 (26%)	199 (19%)	810 (27%)	611	57%
Tyne & Wear	8507	2894 (15%)	663 (23%)	1377 (23%)	714	25%

Table 6.4.3b Graduate Brain-gain in old HEIs

	A	B	C	D	E	F
City	Total Number of Graduates	Local graduates originally from the city (as a % of A)	Local graduates that left the city (as a % of B)	Retention of Graduates from beyond the city (as a % of all non locals)	Scale of Net Change (D-C)	Net Change as a %n of B
G.London	18906	8651 (46%)	1580 (18%)	5067 (49%)	3487	40%
G.Glasgow	3405	1665 (49%)	391 (23%)	711 (41%)	320	19%
G.Edinburgh	5157	1000 (19%)	241 (24%)	1591 (38%)	1350	135%
Aberdeen	2312	809 (35%)	219 (27%)	319 (21%)	100	12%
Dundee	2203	606 (28%)	216 (36%)	426 (27%)	210	35%
G.Manchester	8348	1912 (23%)	528 (28%)	1798 (28%)	1270	66%
Merseyside	4863	1055 (22%)	386 (37%)	854 (22%)	468	44%
West Yorkshire	8570	1301 (15%)	357 (27%)	2045 (28%)	1688	130%
Tyne & Wear	5004	734 (34%)	260 (35%)	970 (25%)	710	97%

The results for brain-gain across all cities (except from new universities in Dundee), suggests that, for both types of university, more external graduates remained than the number of locals that left for employment elsewhere. This is a positive result for all the cities concerned. The results also identified Edinburgh and West Yorkshire as having experienced the largest brain-gain in graduates especially from their old universities. This highlights the important role of external graduates to the local labour markets in these cities and the role of the older universities in retaining the largest number of these graduates.

However, the interpretation of the brain-gain becomes complex when comparing cities whose universities appear to have had very different functions. For example, the northern English cities appear to have had a similar (if not better in some cases) performance in terms of brain-gain as Greater London. However, the student recruitment pattern in London was very different to that of the northern English cities. The majority of graduates from London universities were local whereas, the majority of graduates from the northern English cities were non-local. Thus this had some bearing on the magnitude of the brain-gain in these cities since the larger absolute size of the external graduate population in the northern English cities results in a much larger proportional brain-gain than in cities where the external graduate population is relatively small (e.g. London and Glasgow). This is the same as saying, the larger the size of the external graduate population, the larger the size of the brain-gain effect. None the less, the figure for brain-drain/brain-gain is useful. It highlights the role of external graduates in each city's local labour market. It also provides a more accurate depiction of graduate loss/gain in cities since it is calculated in net terms. However, it would be misguided to compare cities with different HEI characteristics using the figure for brain-gain/brain-drain alone. In this case, the nature of the HEIs in each city and the gross rates of retention would also have to be taken into account. Having said this, some cities do stand apart in both their levels of brain-gain and levels of gross retention. This is especially the case with Greater Edinburgh which had amongst the lowest proportion of local-origin graduates in both old and new universities (similar to that of Manchester and Merseyside), yet experienced amongst the strongest rates of overall graduate retention and brain-gain. It appears that Edinburgh benefited from both strong

retention effects as well as a highly 'open' student intake. In other words, Edinburgh appears to have benefited the most from the retention of external graduates. This is best illustrated by comparing Edinburgh and Glasgow. The latter, had similar retention effects as Edinburgh, but a more 'closed' student intake. Therefore, graduate retention in Glasgow was more dependent on a local population of graduates whereas in Edinburgh graduate retention was more dependent upon external graduates.

6.5 Summary.

Universities in all cities had a positive 'local ladder' role. However, only a few (namely universities in London, Glasgow and Edinburgh) had a sizeable employment – magnet effect upon non-local graduates. The more peripheral cities in northern England, Aberdeen and Dundee did not benefit from a substantial employment – magnet effect. Rather, the findings confirmed their role as overall 'temporary training grounds' for non-locals. None the less, none of the cities experienced an overall brain-drain. This is an important finding highlighting that HEIs in the more peripheral cities are not conduits through which the young and talented depart. Instead there are both inflows and outflows of individuals, which in net terms amount to a brain-gain for all cities. In particular, Edinburgh and West Yorkshire had particularly strong brain-gains. Although all cities benefited from an overall brain-gain in graduates, disaggregating the analysis into brain drain/gain by subject area revealed that Glasgow, Aberdeen, Dundee and Merseyside experienced brain-drains in graduates with qualifications in the Applied Sciences. London, Edinburgh, Manchester and West Yorkshire had consistent gains across all subject areas. Overall, the retention of local-origin graduates was high and therefore not indicative of a problem. However, this was not the case with the retention of external graduates. Therefore, attention should be directed more specifically towards the attraction and retention of external graduates rather than graduates as a whole. The only exception to this would be Greater London which clearly functioned as an employment magnet across all groups of graduates regardless of their origin.

The city-level analysis for graduate origin, destination and brain drain/gain has yielded some interesting trends amongst the nine selected cities. In terms of graduate origin, London and Glasgow were distinctive in their highly *self-contained* graduate profiles i.e. the majority of graduates that had studied in these cities were originally from within them. In contrast, Edinburgh, Dundee and West Yorkshire were characterised by a particularly high proportion of non-local graduates i.e. the most nationally orientated.

In terms of the activity of graduates retained within each city; London, Edinburgh and West Yorkshire had the highest proportion in employment. In contrast, a significant proportion of graduates (approximately 25%) retained in Glasgow, Aberdeen and Dundee were actually continuing further studies. This suggests that graduates retained within London, Edinburgh and West Yorkshire had made the most direct economic impact. The high proportion of graduates continuing into further studies may also highlight the possibility of underemployment in Glasgow, Aberdeen and Dundee if graduates are responding to an inability to secure employment.

Other interesting differences which emerged relate to the type of employment amongst graduates retained within each city. Greater Glasgow and Dundee had the lowest proportion of graduates in full time paid employment (at least one-fifth of graduates retained in these cities were in part-time or other types of employment). In addition, Glasgow, West Yorkshire and Tyne & Wear had the lowest proportion of retained graduates in professional occupations (over one-third of the graduates retained in these cities were in non-professional employment). This further reinforces the possibility of graduate underemployment in some cities.

The analysis of graduate employment by industry also highlighted some significant differences across the cities. The public sector in Dundee and the northern English cities provided employment for up to 60% of the graduates retained there. This is indicative of an over reliance upon the public sector for graduate employment. In contrast, a smaller proportion of graduates retained in

London, Glasgow, Edinburgh and Aberdeen were employed in the public sector suggesting that the private sector in these cities were more buoyant than elsewhere. Overall, the city-level analysis has highlighted quite unique 'city effects' across a number of key variables, the most notable of which highlight differences in graduate employment outcomes.

Chapter 7

Towards an Explanation – Findings from the Graduate Migration Survey

This chapter presents the findings from a postal survey of 900 graduates who had studied at Scottish HEIs between 1996 and 2000. The findings are collected from 276 respondents (representing a 31% response rate). Further information regarding the procedure followed for the collection and analysis of the data has been detailed in chapter four. An example of the questionnaire can be found in appendix I.

The survey represents a complementary approach to the analysis of graduate origin and destination in chapters five and six. The analysis presents a qualitative examination of the factors which can potentially influence decisions about where to live and work. Particular attention will be focussed on whether *economic* motives or *quality of life* factors have a greater influence upon decisions about where to live and work. Increasingly, recent thinking is placing greater significance upon the latter, particularly amongst the so called 'creative classes' - a term which often includes university graduates under its definition (Florida 2002). Finally, conducting the survey in conjunction with University Alumni services represents a unique approach to collecting information about the movement and employment of graduates over a longer time scale[11].

The aim of this chapter is to understand the factors which can influence all significant relocations[12]. The chapter begins with a summary description of the data collected.

[11]Normally, the annual first destinations survey of graduates conducted by careers services at each UK university is limited to collecting data six months after the date of graduation. The survey designed for this analysis considers graduate destinations beyond the six month stage

[12] A significant relocation is defined as any move which involved relocating entirely to another city. This definition does not include changes of residence or employment which occur within the same city.

7.1 Summary description of survey respondents.

Figure 7.1.1 Respondents according to university attended.

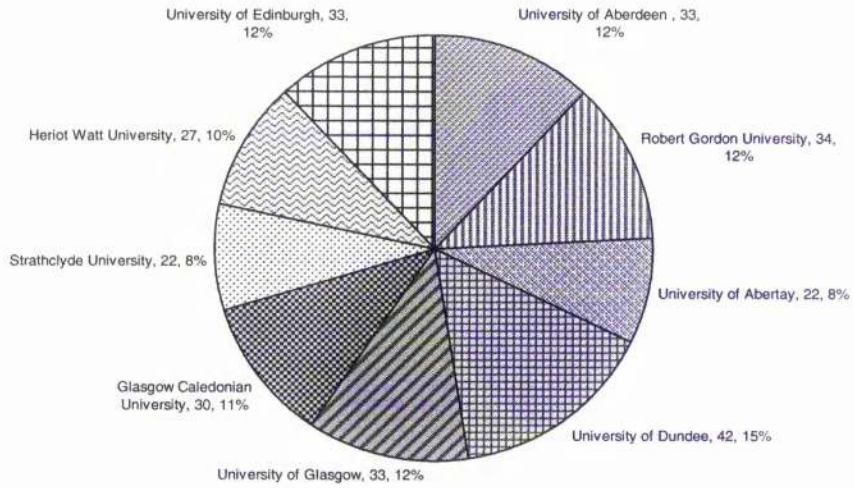


Figure 7.1.2 Proportion of respondents in full time employment.

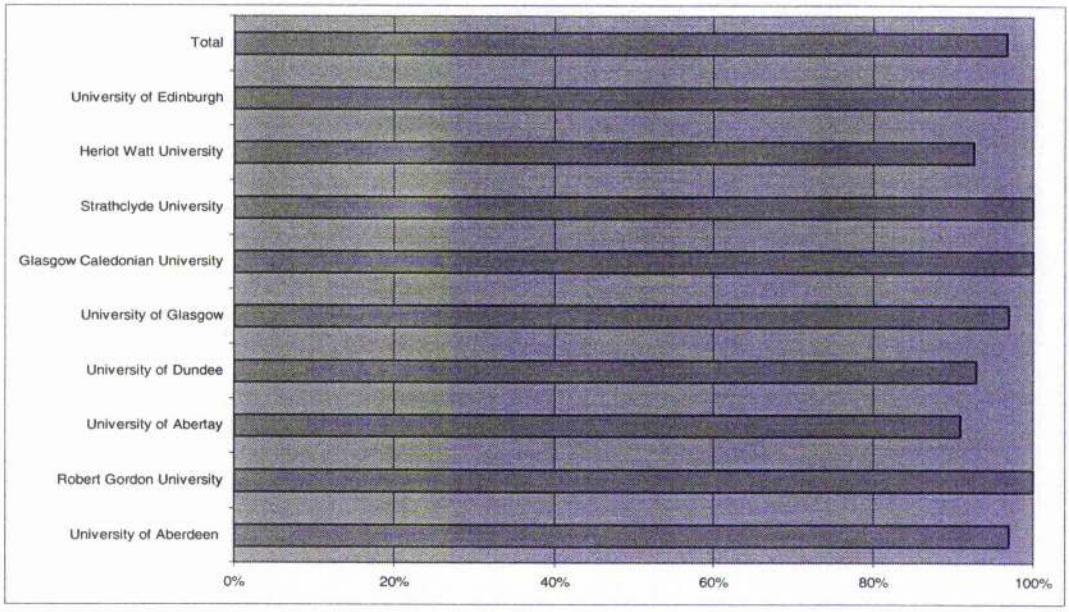


Figure 7.1.1 presents the survey respondents according to the university that they had attended. Figure 7.1.2 indicates that the majority of respondents were in full time employment at the time of the survey.

Figure 7.1.3 The current location of respondents.

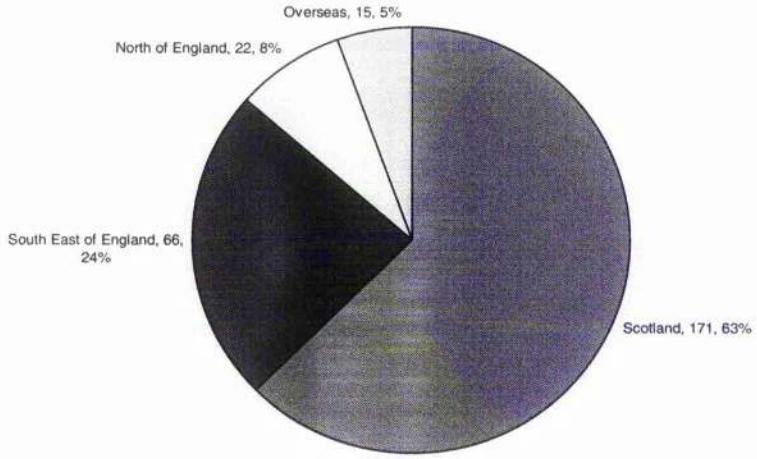
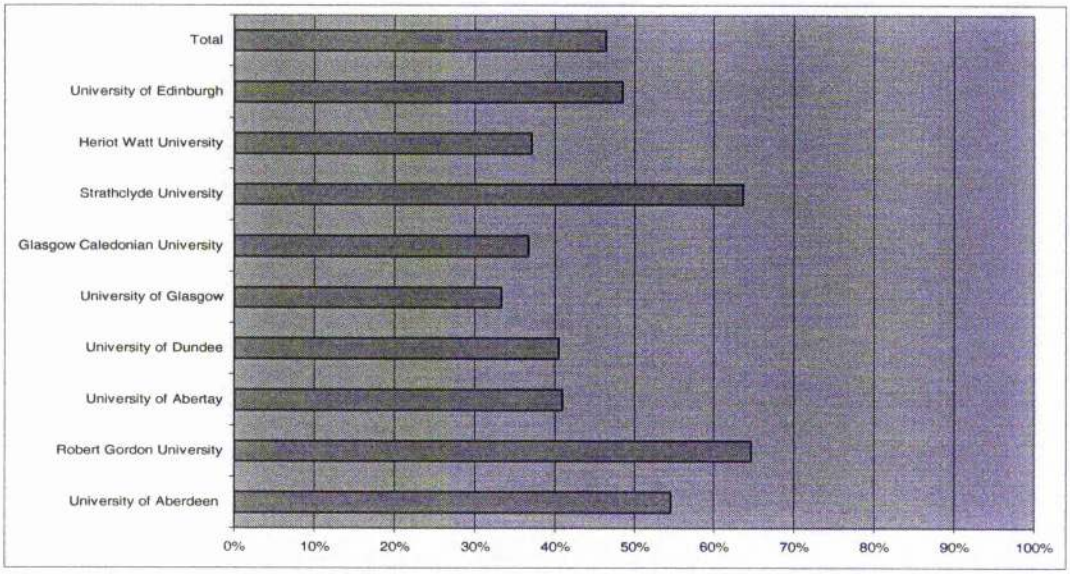


Figure 7.1.3 shows that nearly two-thirds of all respondents were currently living and working in Scotland. Approximately one-quarter were in the South East of England, Just over one-fifth were in the North of England and under one-fifth were overseas.

Figure 7.1.4 First full-time job.



In total, Figure 7.1.4 shows that approximately half of all respondents were in their first full-time job. This proportion was higher for respondents from Strathclyde, Robert Gordon and Aberdeen universities.

Figure 7.1.5 Proportion of respondents who had graduated more than a year before.

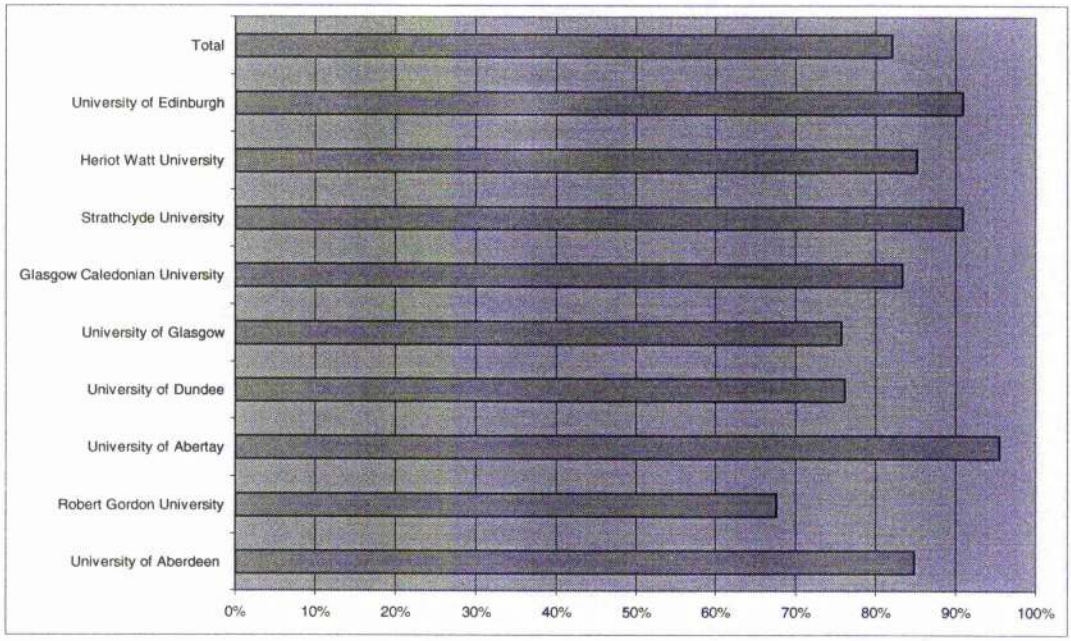


Figure 7.1.5 shows that the majority of respondents in the survey and from each HEI were non-recent 'older' graduates. In other words, the majority of respondents had graduated and had left their university for over a year. In addition, the respondents were equally distributed amongst Arts and Science subjects, and between Bachelors and Postgraduate degrees.

Figure 7.1.6 presents the number of relocations that had occurred amongst respondents. Approximately one-third of all respondents had remained in their university town; two-fifths had relocated once and approximately one-quarter had relocated more than once since graduating.

Figure 7.1.6 The Number of Relocations amongst respondents.

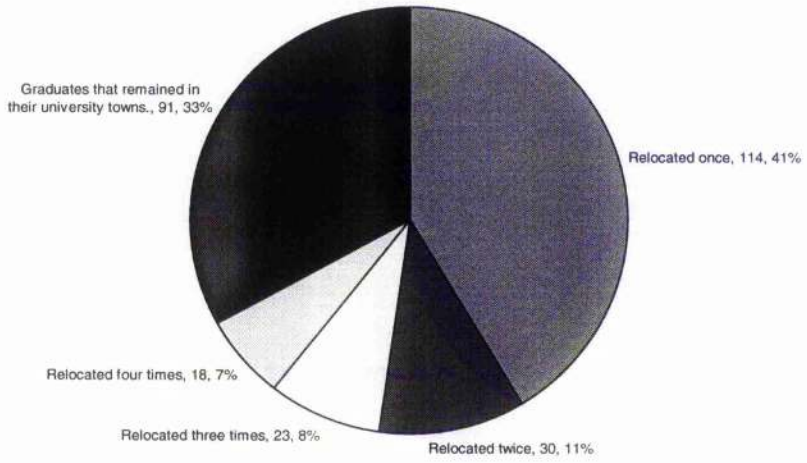


Figure 7.1.7. The Current Location of Survey Respondents.

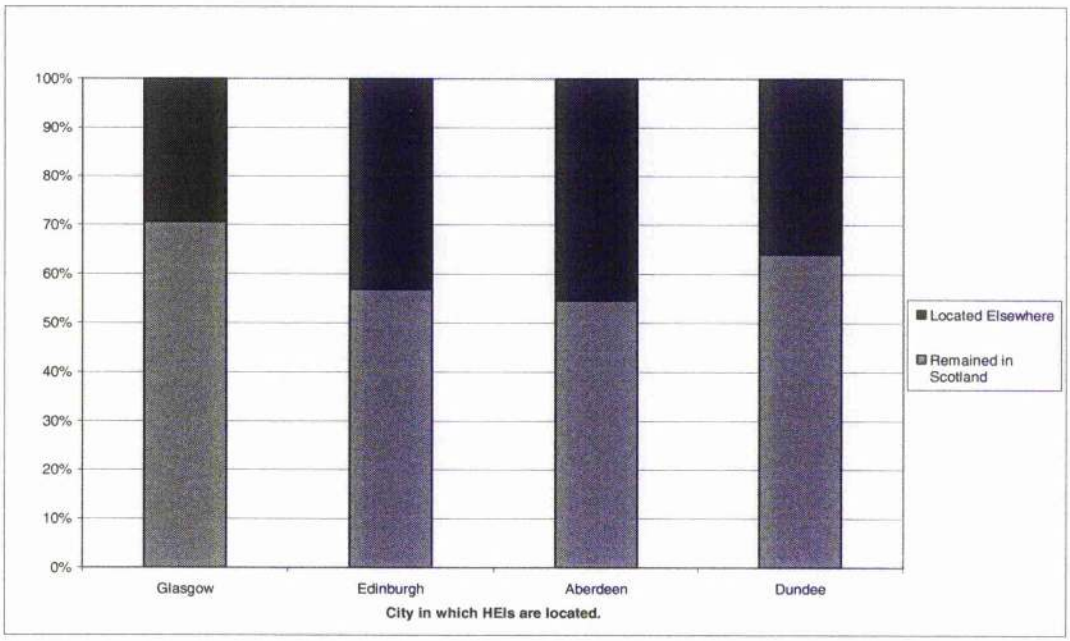


Fig 7.1.7 indicates that there was minimal variation in the composition of respondents from universities in the four different Scottish cities. In other words over half had remained in Scotland for employment. However, the proportion was higher for respondents from universities in Glasgow and Dundee. In this case, over two-thirds of the respondents were currently employed in Scotland.

Figure 7.1.8 Frequency of Relocations amongst Graduate Survey Respondents studying in different cities.

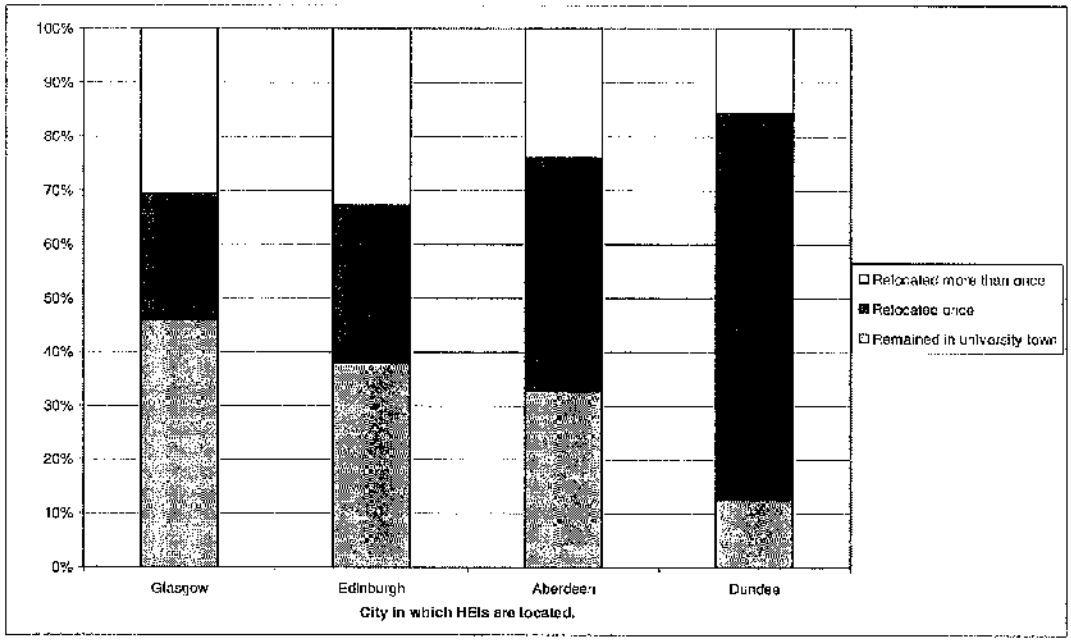


Figure 7.1.8 indicates that the respondents that had studied in Glasgow had the lowest number of relocations with nearly half having remained in the city after their studies. Less than two-fifths of the respondents from HEIs in Edinburgh and Aberdeen had remained in their university towns. Finally, Dundee appeared to have been the most unusual in that, the majority of respondents had relocated once only.

Table 7 Comparison of Graduate locations according to type of HEI attended.

Type of University	Remain in Scotland	Locate Elsewhere	Total
Old (pre 1992)	52%	48%	100%
New (post 1992)	78%	22%	100%

Table 7 indicate that the majority of graduate respondents from the 'new' universities remained in Scotland. Respondents from older universities were more likely to have located elsewhere. Thus, the trends in respondent

characteristics are broadly in line with the overall destination patterns for graduates from these cities (as quantified by HESA data).

Table 7.1 Frequency of Relocations according to type of HEI.

Type of University	Remain in University-town	Relocate once	Relocate more than once	Total
Old HEIs	24%	46%	30%	100%
New HEIs	47%	33%	20%	100%

Table 7.1 indicates that the frequency of relocations was higher amongst respondents that had attended the older universities. Respondents from the new HEIs were much more likely to have remained in their university towns. The only exception to this was Dundee, where the majority had relocated once.

Table 7.2. Proportion of Arts & Science Graduates remaining in Scotland.

	Arts Graduates	Science Graduates
Remain in Scotland	65%	59%
Locate Elsewhere	35%	41%
Total	100%	100%

Table 7.2 indicates that a slightly higher proportion of Arts graduates remained in Scotland. Therefore, amongst the respondents to the survey, Arts graduates were more likely to have remained in Scotland and Science graduates were more likely to have left.

7.2 The motives influencing graduate destination.

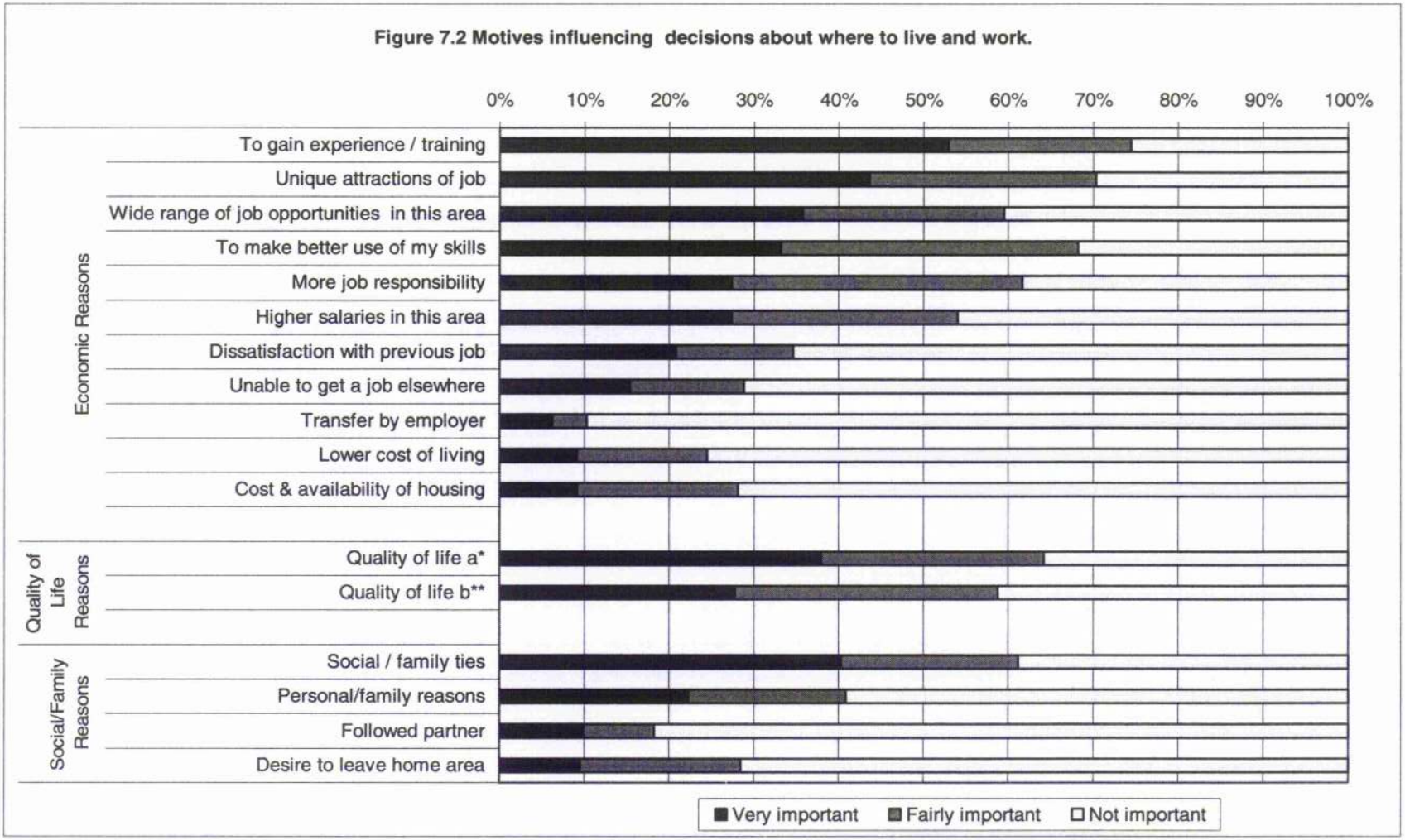
This chapter is based upon the questions contained within the postal survey and highlights the 17 motives that may have a bearing upon decisions about where to live and work. These were collated from a series of prompted questions (see appendix I). The motives have been broadly categorised to capture the *economic*, *quality of life* and *social / personal* reasons which can potentially affect an individual's decisions about where to live and

work. The analysis begins by considering the data in aggregate. This is followed by examining the relative importance of each motive across different groups of graduates.

Figure 7.2 overleaf, presents the aggregated data for all respondents to the survey. Figure 7.2 gives the level of importance placed upon each reason by all graduates when considering their current place of work and residence. The most important finding is the mixed pattern. In other words, no particular set of factors dominated in terms of influence. Looked at in more detail, over half of all the graduates clearly rated the need to gain experience / training as 'very important' when deciding where to live and work. This was followed by approximately two-fifths of all graduates considering the unique attractions of their job, their social / family ties and the quality of life in the destination area (in terms of entertainment venues & cultural activities) as 'very important'. Cost of living & housing issues and issues relating to the inability of finding a job appear to have had the least impact upon employment-location decisions.

Therefore, taken in aggregate, the initial findings present a mixed picture. Graduates are most strongly motivated by the need to get onto the career ladder by gaining work experience / training as well as the unique attractions of the employment they are pursuing. In slight contrast, less than two-fifths of graduates considered the quality of life as very important. Therefore, quality of life (in terms of entertainment/cultural venues) and social/family ties are somewhat second order motives. Living / housing costs appear to be the least important to graduates as a whole. The following analysis will seek to distinguish any differences in motivation amongst graduates with different characteristics.

Figure 7.2 Motives influencing decisions about where to live and work.

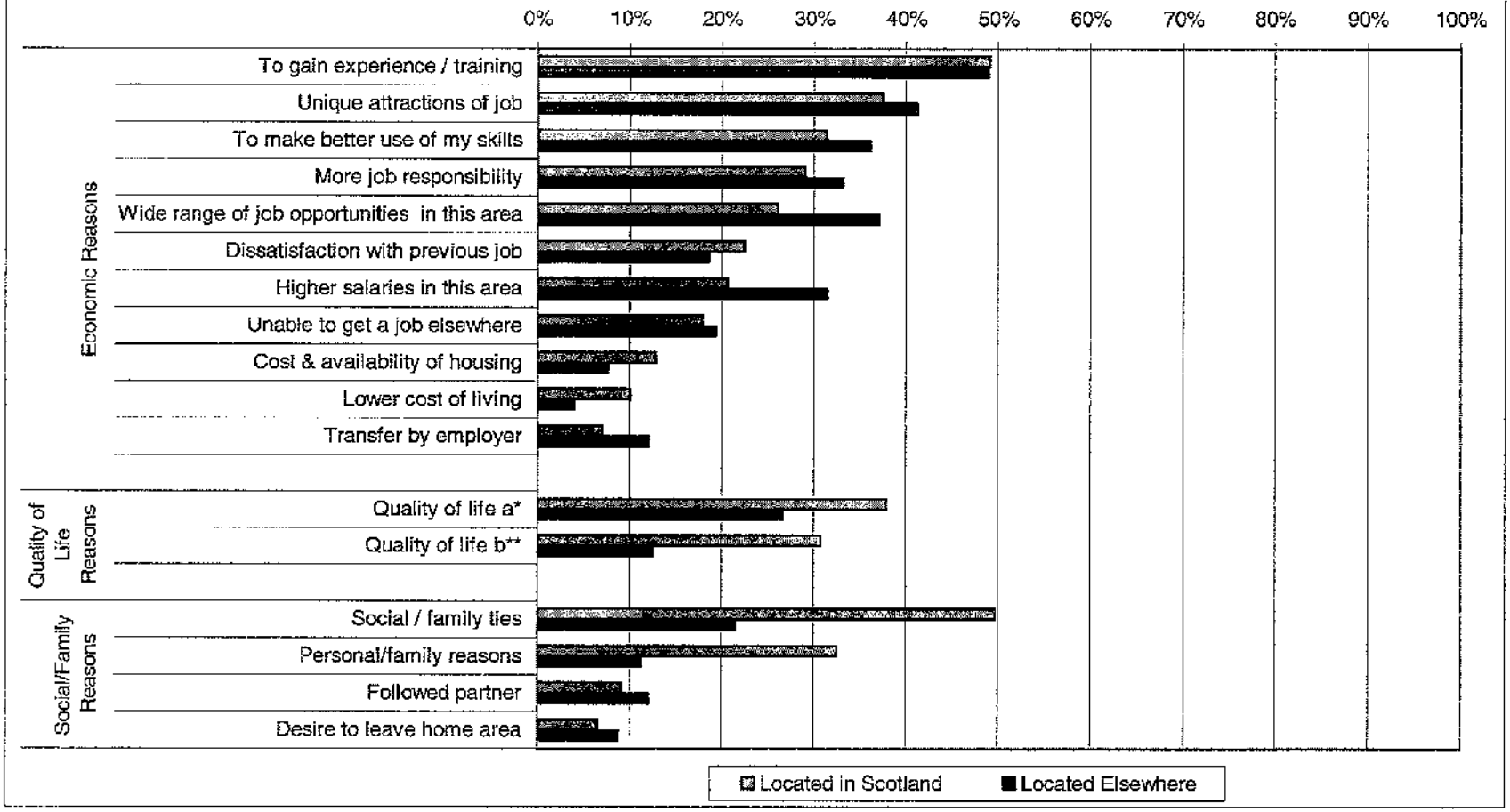


n.b. Quality of life a* : culture & entertainment venues; Quality of life b**: access to nature/outdoor activities

Figure 7.2.1 overleaf, highlights the factors considered 'very important' by graduates that remained in Scotland for employment and those who left. Approximately half of the graduates in both groups reported the need to gain experience/training as a very important motive. This appears to be the primary driving force for all graduates regardless of destination. However, some key differences emerged between those who remained in Scotland and those who left. There was a significantly greater level of importance placed upon pursuing 'wider job opportunities' and 'higher salaries' by graduates locating in areas outside of Scotland. Nearly two-fifths of graduates that had located outside of Scotland considered the 'wider range of job opportunities' as a very important motive. Similarly, nearly one-third considered the higher salaries available in areas outside of Scotland as a very important influence upon their decisions to leave. Interestingly, in terms of the influence that quality of life had upon location decisions, the graduates who had remained in Scotland rated both categories considerably higher than those who had left. Similarly, Social /family ties were also significantly influential upon those graduates deciding to remain within Scotland. Interestingly, it appears that social & family ties and the quality of life, did not have a significant influence upon the decisions of graduates who had left Scotland.

Therefore for those who left Scotland, economic reasons were the most influential motive with wider job opportunities and higher salaries being key. In contrast, people who stayed in Scotland were clearly more driven by the quality of life and social ties. In contrast, for those who left Scotland, economic factors were the driving force rather than softer values such as the quality of life in the destination area. This provides an interesting perspective upon current thinking which suggests that 'quality of life' and place attractiveness are now the primary factors which attract a skilled and mobile workforce (Florida 2002). The findings in the analysis so far suggest that economic factors remain the strongest *attracting* force and that quality of life appears to be more highly valued by those who choose not to leave an area i.e. it may have more of a *retaining* effect rather than an *attracting* effect in this particular scenario. This highlights the dominance of economic factors over quality of life amongst *out-migrating* graduates.

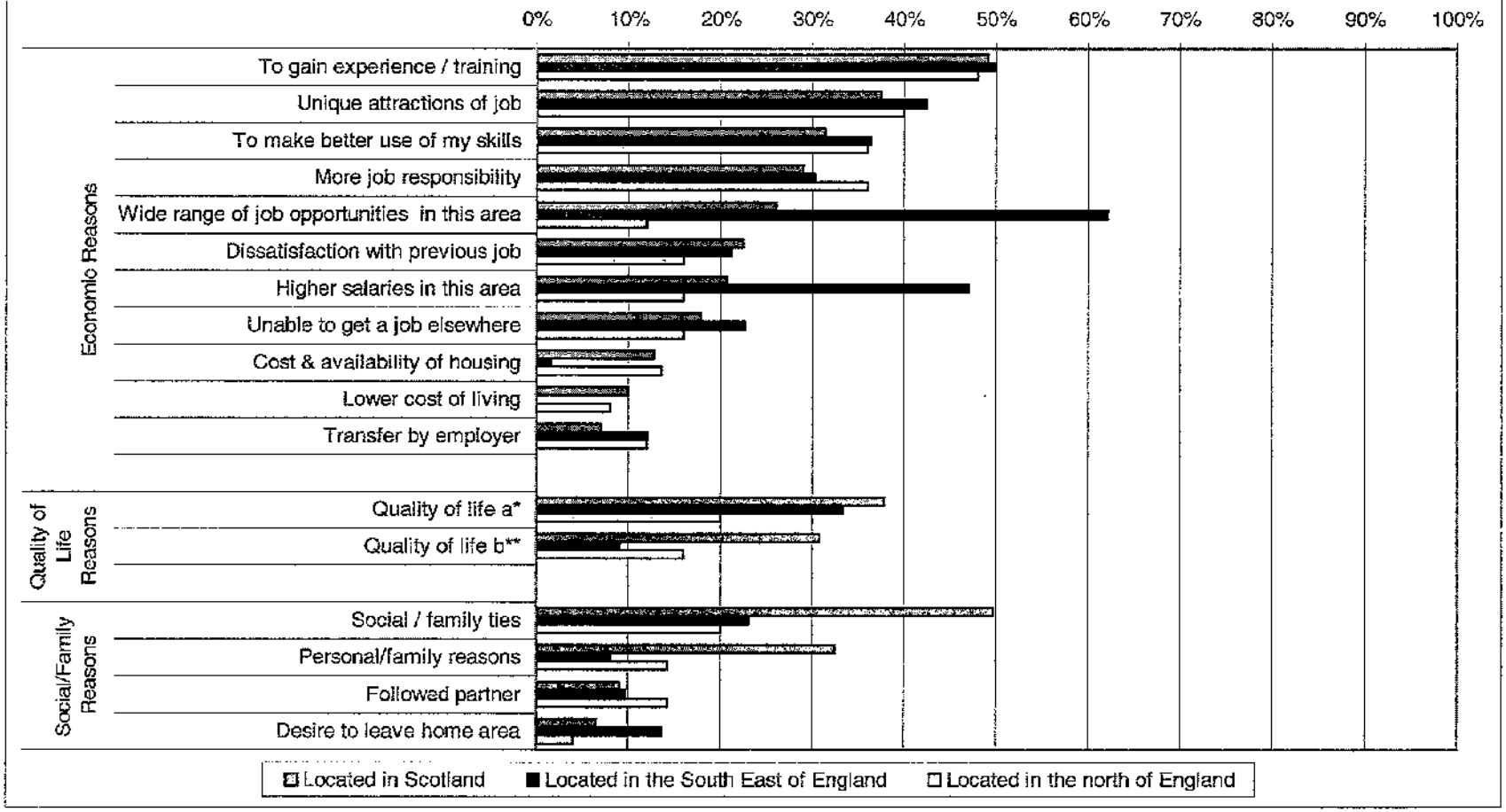
Figure 7.2.1 Comparison of Motives considered 'very important' by graduates that remained in / left Scotland.



n.b. Quality of life a* : culture & entertainment venues; Quality of life b**: access to nature/outdoor activities

Figure 7.2.2 overleaf, presents the data in greater detail by distinguishing between all three UK regions in which graduate survey respondents were working and living. Once again, the motives which exhibited the greatest differences amongst the graduates were related to the wider range of jobs available and higher salaries. In particular, graduates that had located in the south east of England rated these motives as the strongest in influencing their decision to locate there. Over 60% of the graduates that were located in the South East rated 'wider job opportunities' as very important and nearly one half rated 'higher salaries' as very important. These factors appeared not to be as important to graduates working and living in Scotland or the north of England. The level of importance attached to the quality of life (in terms of entertainment and cultural venues) was lowest amongst the graduates located in the north of England and significantly higher amongst graduates working and living in Scotland and the South East. Finally, Social/family reasons appear to have had most influence amongst the graduates remaining in Scotland. Once again, this highlights the significance of economic factors over quality of life factors to graduates who are out-migrating, especially to core economic areas such as the South East. The graduates locating to the South East were distinctive in this sense. This finding conforms to most accounts of internal migration in the UK, which identify the South East as an 'escalator' region which attracts labour from the periphery, who then benefit (or hope to) economically/professionally from the agglomeration economies and higher salaries within the region (Audretsch, 1998; Fielding 1992). The findings for graduates locating to the South East also suggest that the quality of life is not as great an influence upon their decisions. Instead, the quality of life and social/family motives had a significant impact in encouraging people to stay in Scotland. Once again, this suggests that the softer characteristics such as the quality of life in the destination area are not overwhelmingly influential for out-migrating graduates. This tends to contradict the contemporary discourse relating to the primacy of quality of life/place attractiveness in bids to attract skilled labour, graduates, young 'talent', or the 'creative classes' (Florida 2002). The findings also highlight the much greater

Figure 7.2.2 Motives considered 'very important' by graduates located in different regions.

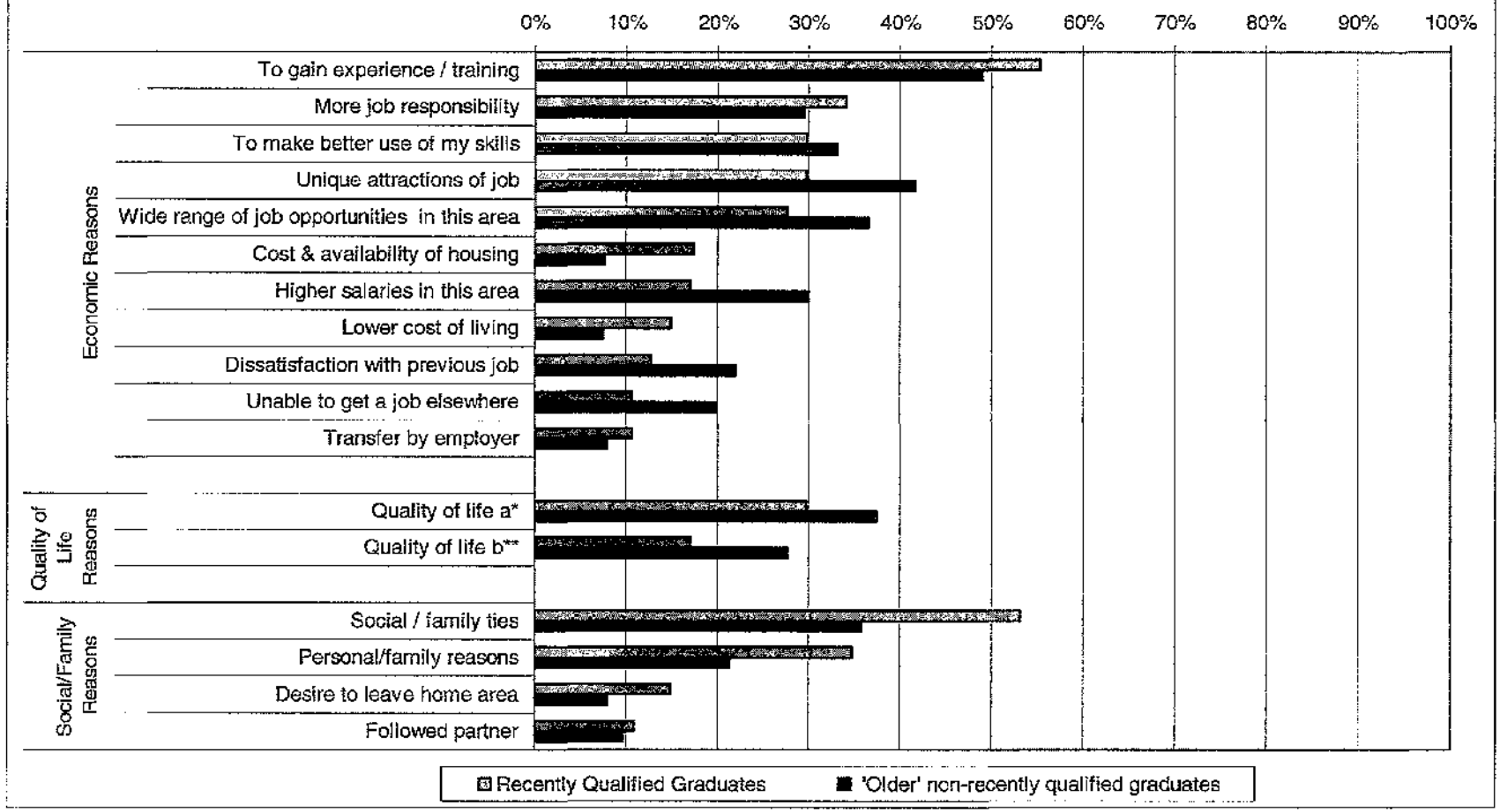


n.b. Quality of life a* : culture & entertainment venues; Quality of life b**: access to nature/outdoor activities

significance placed upon these softer factors by graduates choosing to remain in Scotland. This may simply reflect the social/family ties present amongst these individuals and/or a greater sense of place loyalty. In contrast it would appear that amongst the mobile, out-migrating graduates, economic reasons are still the most dominant motivation.

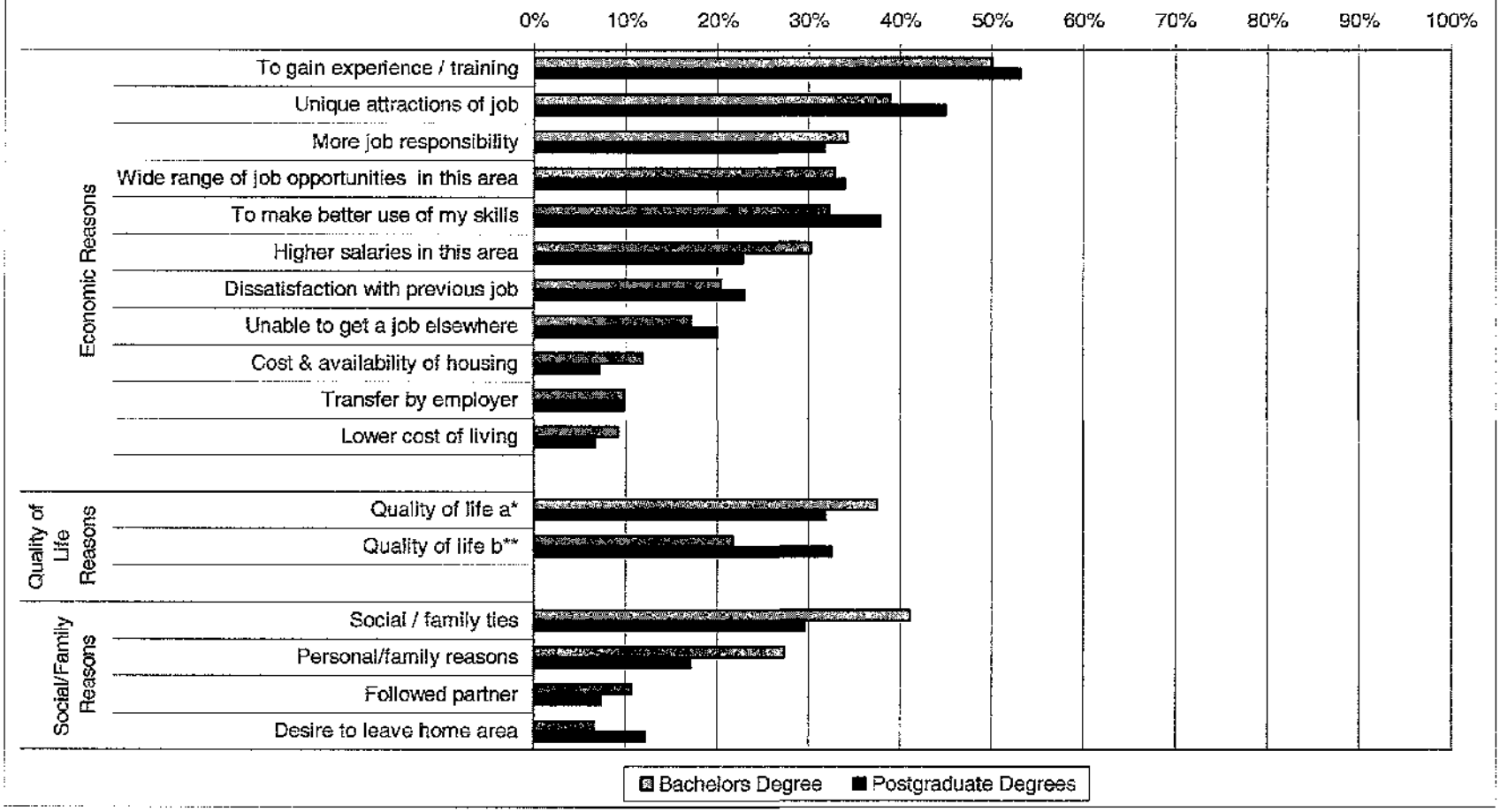
Figure 7.2.3 overleaf, presents the data for recently qualified graduates (graduated within the previous year) and older graduates (qualified for over one year). The level of importance placed upon each motive appears to change over time. In particular, as graduates become older, they appear to place significantly greater emphasis upon the unique attractions of a job; the wider job opportunities within an area and higher salaries. In addition, quality of life factors also gain in importance over time whereas social/family reasons decrease in importance reflecting a greater level of independence perhaps. Interestingly, the significance of the costs of living and housing appear to decrease in importance amongst older graduates. The indication is that as graduates gain more experience, there is an increasing level of importance placed upon specifically job-related factors as well as quality of life factors. From this, it is evident that both economic and quality of life factors have an increasing level of significance to graduates as they grow older. Social and family ties appear to have a decreasing influence. Thus, as graduates gain more experience and become more independent, it appears that career/economic factors as well as some aspects of quality of life increasingly have a greater bearing upon their migratory decisions. This emphasises the importance of opportunities for career development to this segment of the labour force. As such, core economic regions are more likely to be better placed to offer a wider range of employment opportunities and employers. However, it is notable that the significance of quality of life increases as graduates become older, suggesting that it may have a significant albeit secondary role.

Figure 7.2.3 Motives considered 'very important' by recent and non-recent graduates.



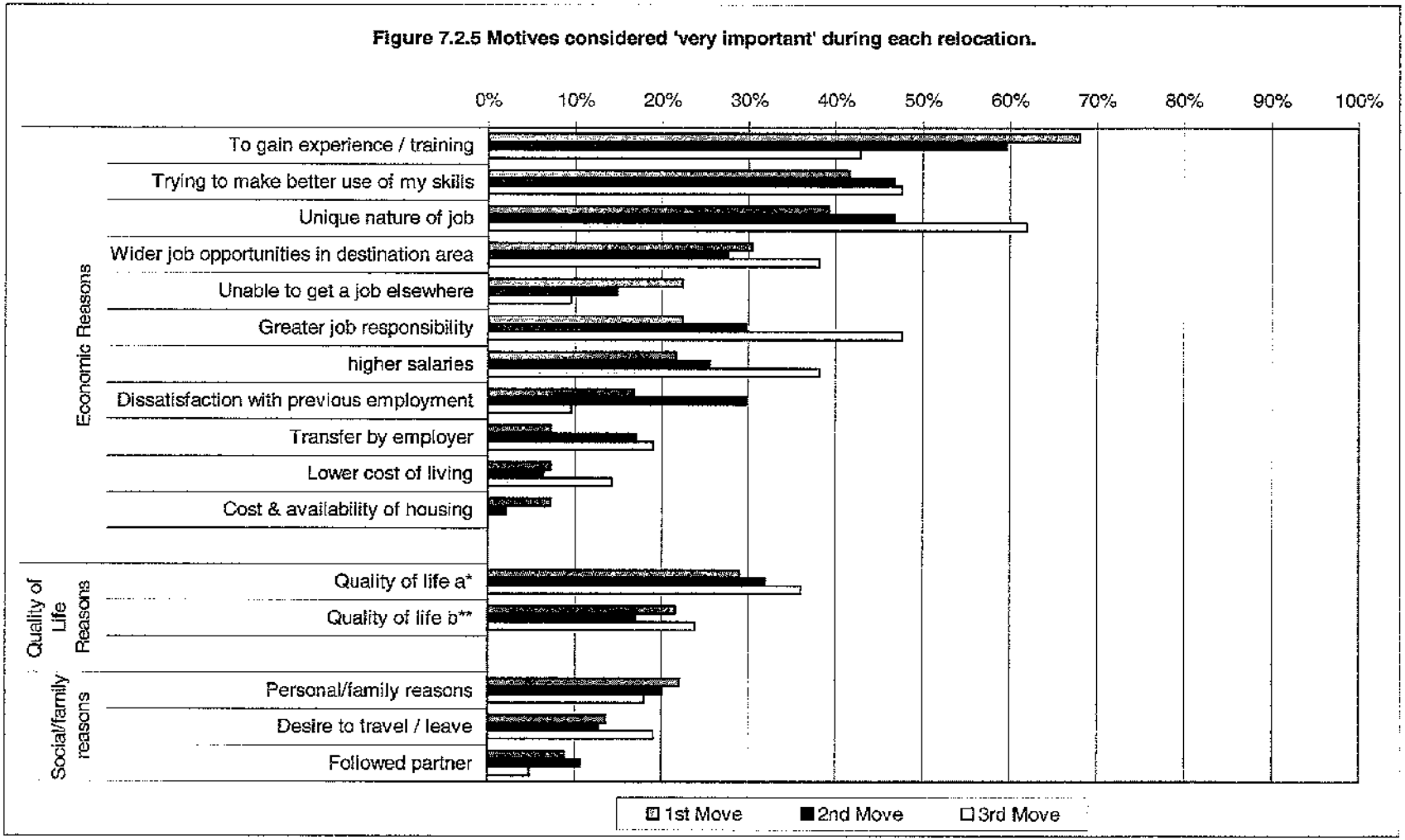
n.b. Quality of life a* : culture & entertainment venues; Quality of life b**: access to nature/outdoor activities

Figure 7.2.4 A Comparison of Motives by Level of Qualification



n.b. Quality of life a* : culture & entertainment venues; Quality of life b**: access to nature/outdoor activities

Figure 7.2.5 Motives considered 'very important' during each relocation.



n.b. Quality of life a* : culture & entertainment venues; Quality of life b**: access to nature/outdoor activities

Figure 7.2.4 (refer to page 139) presents the level of importance placed upon each motive by graduates with different qualifications. Graduates with second degrees appear to place more emphasis upon the unique attractions of a job and trying to make better use of their skills when considering where to live and work. Interestingly, higher salaries were less of a motivation to those with postgraduate qualifications. Quality of life in terms of outdoor/recreational activities also appeared to be more important for postgraduates. Social/family ties appear to decrease in importance for those with second degrees, perhaps because they tend to be older. Overall, economic reasons and professional development appear to be more of a priority to postgraduates. This also suggests that the more highly skilled are increasingly driven by employment considerations.

Figure 7.2.5 (previous page) presents the motives considered 'very important' for each consecutive relocation. As would be expected, the need to gain experience / training falls in importance with each move. This perhaps reflects the fulfilment of this motive over time. The unique nature of a job appears to have had increasing significance over consecutive relocations, as does the pursuit of greater job responsibility and higher salaries. Overall, most of the economic motives appear to increase in significance for each of the relocations. The quality of life in a destination area also increases in importance but not substantially. Social/family reasons appear not to have a great bearing upon consecutive relocations. Thus generally, in terms of their influence in decisions to relocate, both economic and quality of life factors appear to become more important over time although the former remains dominant.

7.3 A comparison of motives for graduates who remained in and who left the region where they had studied.

The following analysis considers motives influencing location decisions that were made by graduates who had studied in different cities. The purpose of this is to identify any variation in the response from graduates that had studied in different Scottish cities [13].

From figure 7.3 overleaf, it is clear that graduates who had studied at Edinburgh, Aberdeen and Dundee remained in their university towns for employment afterwards, mainly as a result of strong social and family ties. In contrast, for Glasgow graduates the motive for remaining was strongly economic. Figure 7.3.1(refer to page 145) presents the motives considered most important by graduates who had decided to leave their place of study. Clearly, the motive that had driven these graduates were economic. Interestingly, in both cases graduates that had studied in Glasgow were strongly motivated by economic reasons regardless of whether they had chosen to remain or to leave. In general, these initial findings suggest that graduates move away because of economic reasons. However, those who remain, do so mainly because of social and family ties. Once again this is broadly in keeping with earlier findings which indicate that social ties and quality of life are factors which have a retaining effect. In other words, the motivating factor influencing the decision to leave an area is still mainly economic whereas the motivating factor influencing the decision to stay is mainly social.

[13] The definition of the city in this case is the same as that contained in Appendix B. Therefore, each definition encapsulates the greater city area.

Fig. 7.3 The single 'most important' factor influencing graduates that had remained in the city in which they had attended university.

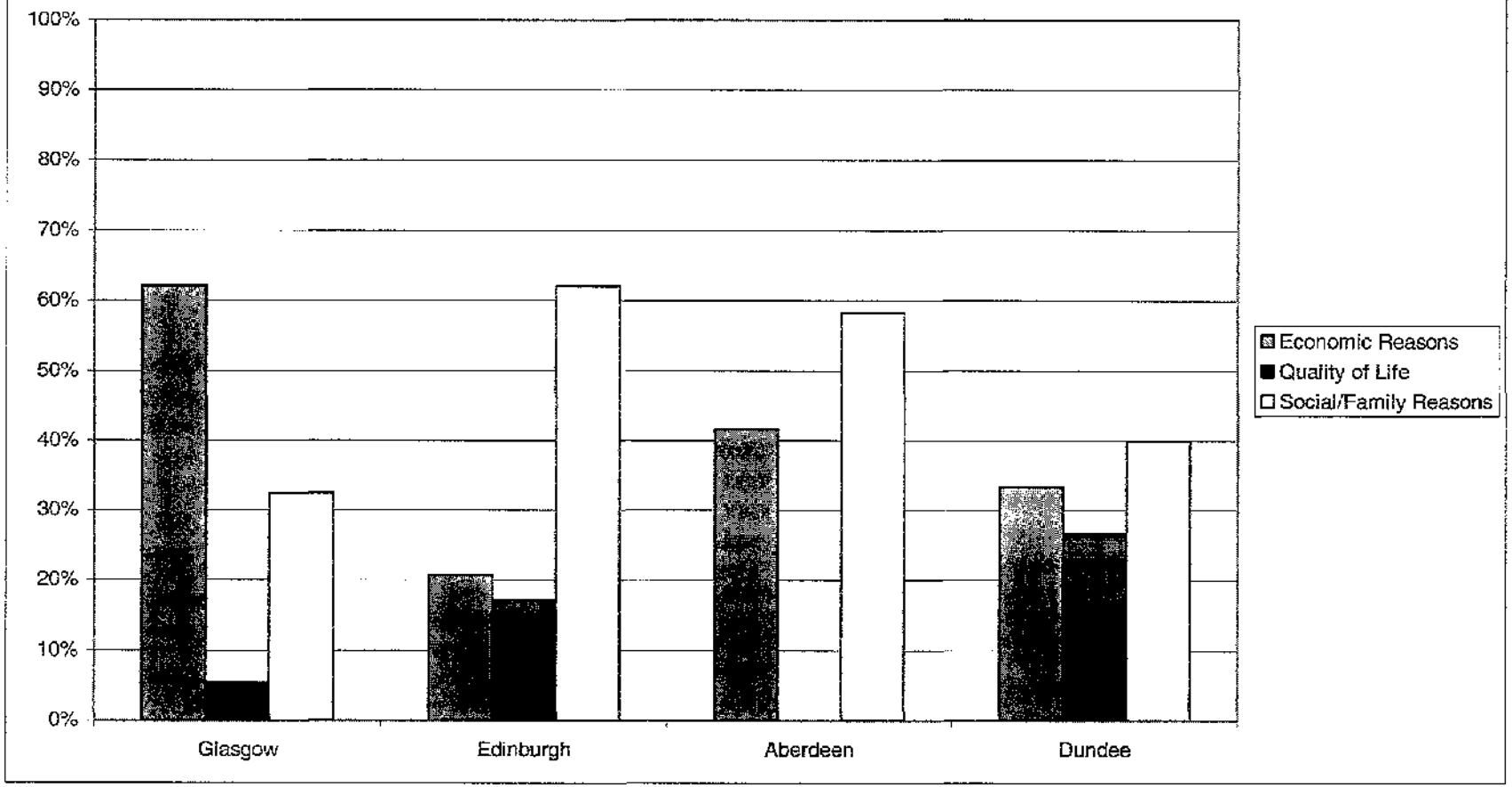
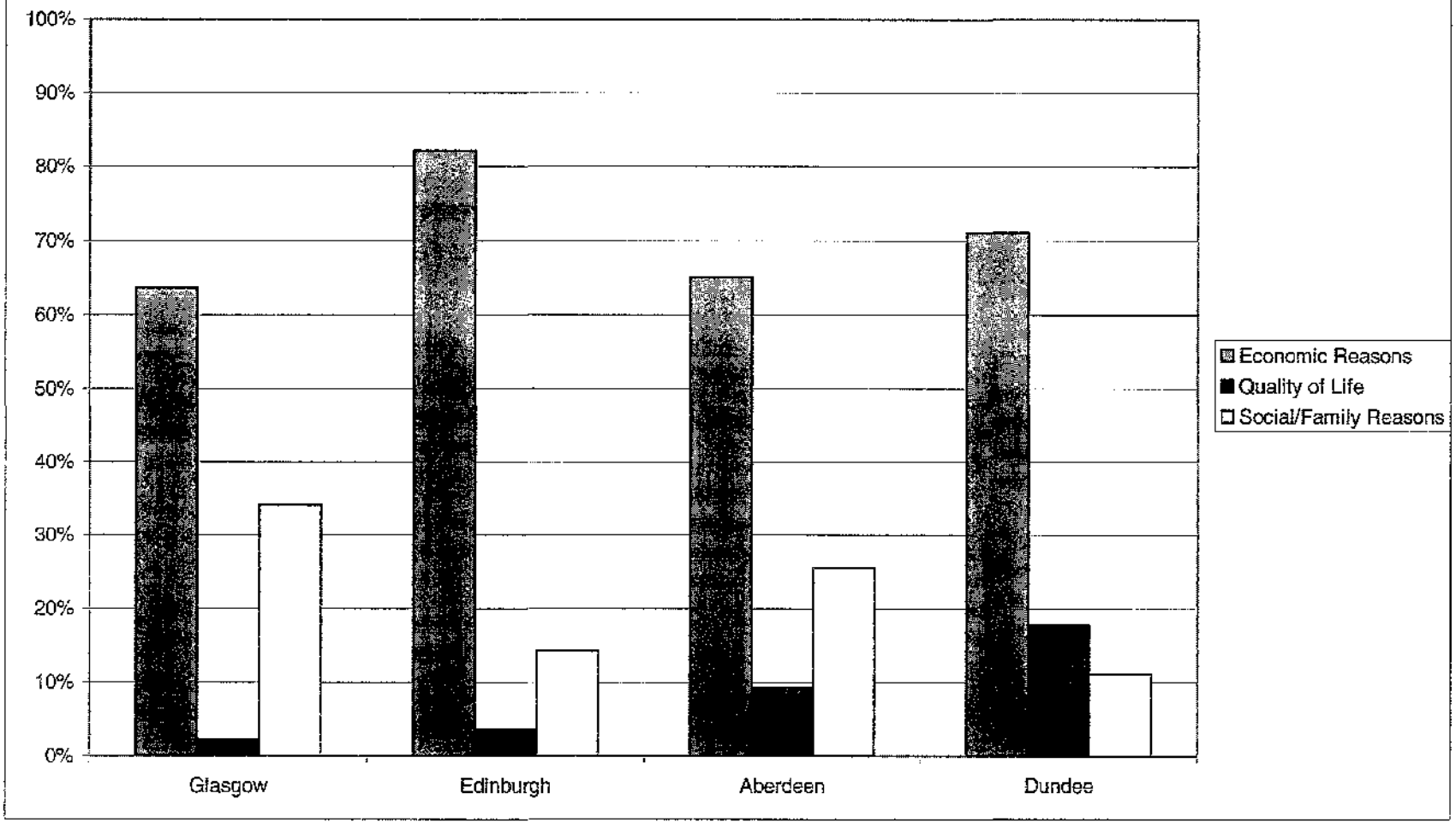


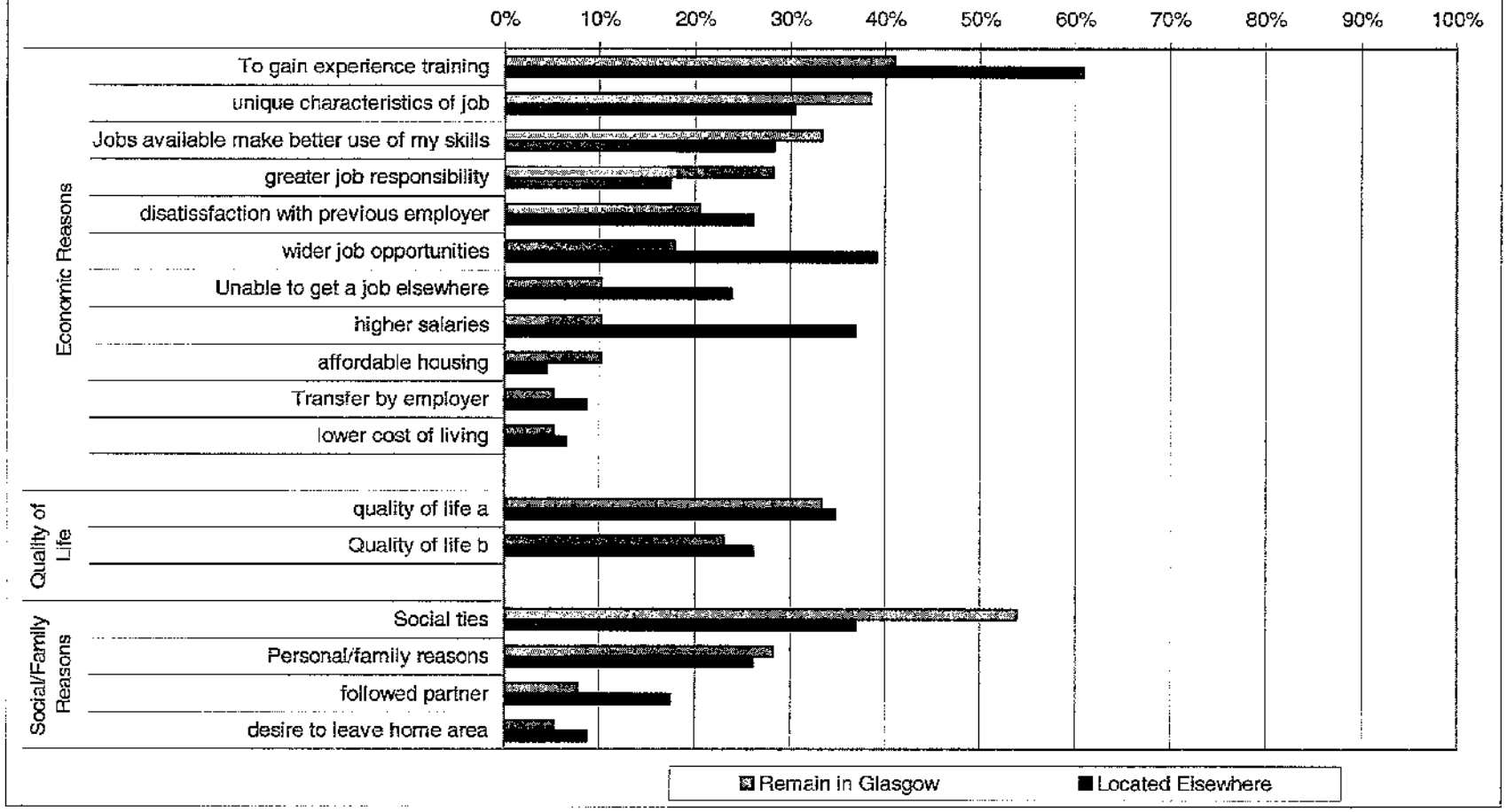
Fig. 7.3.1 The single 'most important' factor influencing graduates that left the city in which they had attended university.



Clearly, for graduates leaving Glasgow (Fig. 7.3.2, overleaf) the desire to gain experience, have access to wider job opportunities and higher salaries were the strongest motivation. At least 60% of graduates that had left Glasgow considered the need to gain experience as 'very important' in their decision to leave. Approximately 40% of the graduates that had left Glasgow considered wider job opportunities and higher salaries as 'very important'. In contrast, graduates that had remained in Glasgow were clearly driven by their social ties to the city. At least half of the graduates that had remained in Glasgow considered social ties as a very important reason. Interestingly, there was little variation in opinions about quality of life as a motivation. About one-third of both retained graduates and out-migrating graduates considered it as a very important motive in their decisions.

There were similar findings for Edinburgh city graduates (Fig. 7.3.3 on page 147). Overall, economic motives were more significant to graduates leaving the city and social ties were more important to those choosing to remain. In particular, for graduates leaving Edinburgh, the unique characteristics of their job was the strongest motivation, followed by access to wider job opportunities and higher salaries. The emphasis on the individual economic factors differed to those of Glasgow slightly. For example, the disparity between perceptions about wider job opportunities and higher salaries amongst retained and out-migrating graduates was not as great as it was for Glasgow graduates. In addition, graduates qualifying from Edinburgh HEIs appear to place much greater emphasis upon quality of life factors than any other group. 60% of the graduates that had remained in the city considered the quality of life (in terms of entertainment and cultural venues) as a 'very important' motivation. Finally, like all the other cities, social ties were clearly the driving motives amongst graduates remaining in Edinburgh.

Fig. 7.3.2 Glasgow city graduates and the motives that were considered 'very important' in their decisions to remain or to leave the city.



n.b. Quality of life a : culture & entertainment venues; Quality of life b: access to nature/outdoor activities

Fig. 7.3.3 Edinburgh city graduates and the motives considered 'very Important' in their decisions to remain or to leave the city.

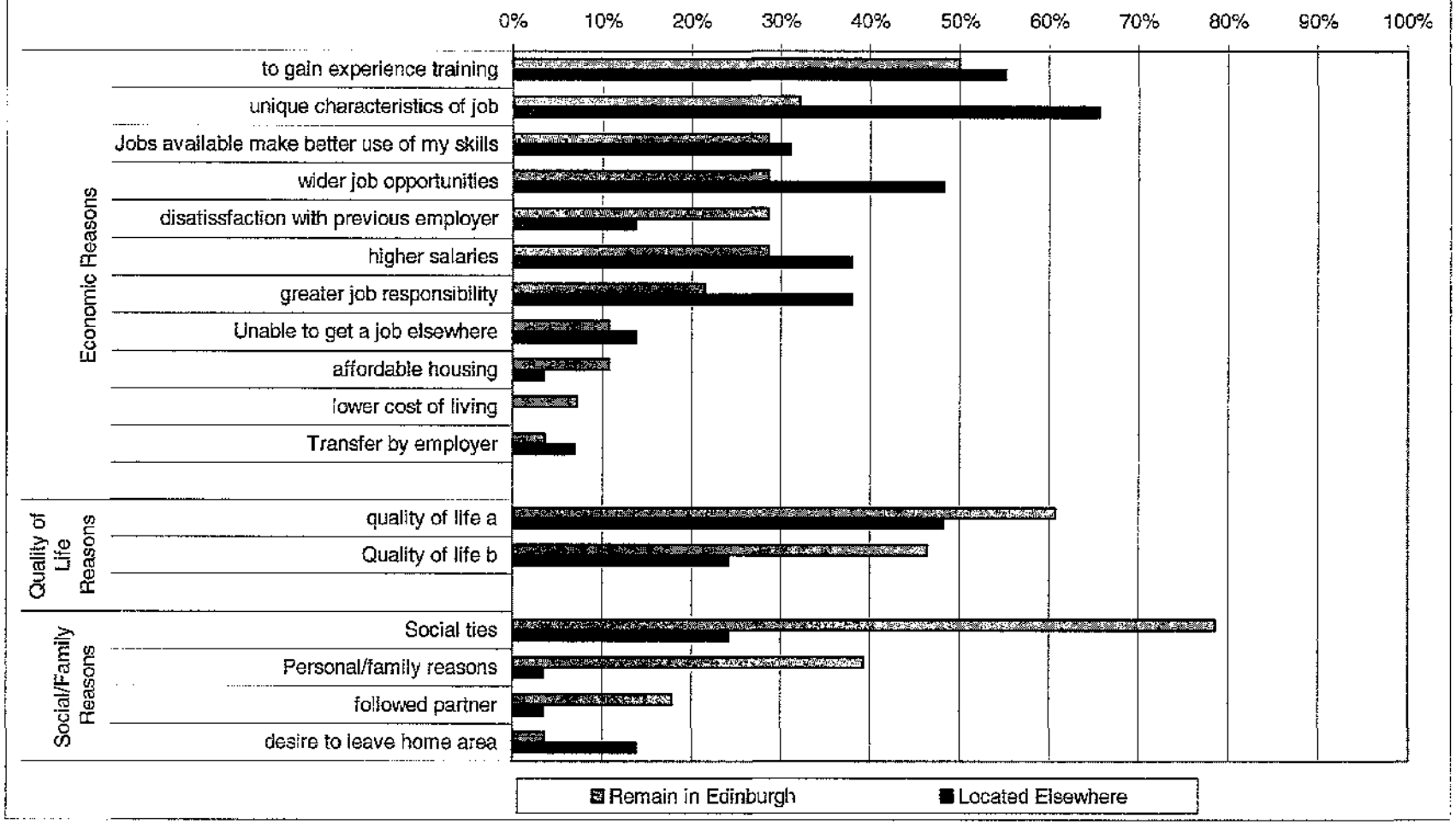


Fig 7.3.4 overleaf, presents the results for graduates from universities in Aberdeen. The strongest motivation for graduates leaving the city was the need to gain experience/training and increasing their access to wider job opportunities. Interestingly, unlike Glasgow and Edinburgh, higher salaries were not a significant motivation for graduates leaving Aberdeen HEIs. Once again, social ties were the strongest motivation amongst graduates remaining in the city.

The results for Dundee are presented in Fig 7.3.5 (refer to page 150). These results appear to differ from the other cities in that there aren't any clear differences in the economic motivations between graduates that remain and those who left the city. Economic factors appear to be equally important to both groups of graduates with the exception of higher salaries which are once again, more important to the graduates that had left the city. For, those who remained, social ties appear to have been the most important driving force.

The relative importance of the motives amongst graduates that left their university towns is presented in Fig 7.3.6 (on page 151). This presents a comparative picture for the reasons which influenced graduates to leave their university town. For example, higher salaries appear to be a strong motive amongst graduates that left Glasgow and Edinburgh. The unique characteristics of a job, appears to be particularly important to Edinburgh and Dundee graduates. On the other hand, the inability of finding a job was highly significant for graduates leaving Glasgow and Dundee. Once again, this may reflect the labour market conditions within each city.

Fig. 7.3.4 Aberdeen city graduates and the motives considered 'very important' in their decision to remain or to leave the city.

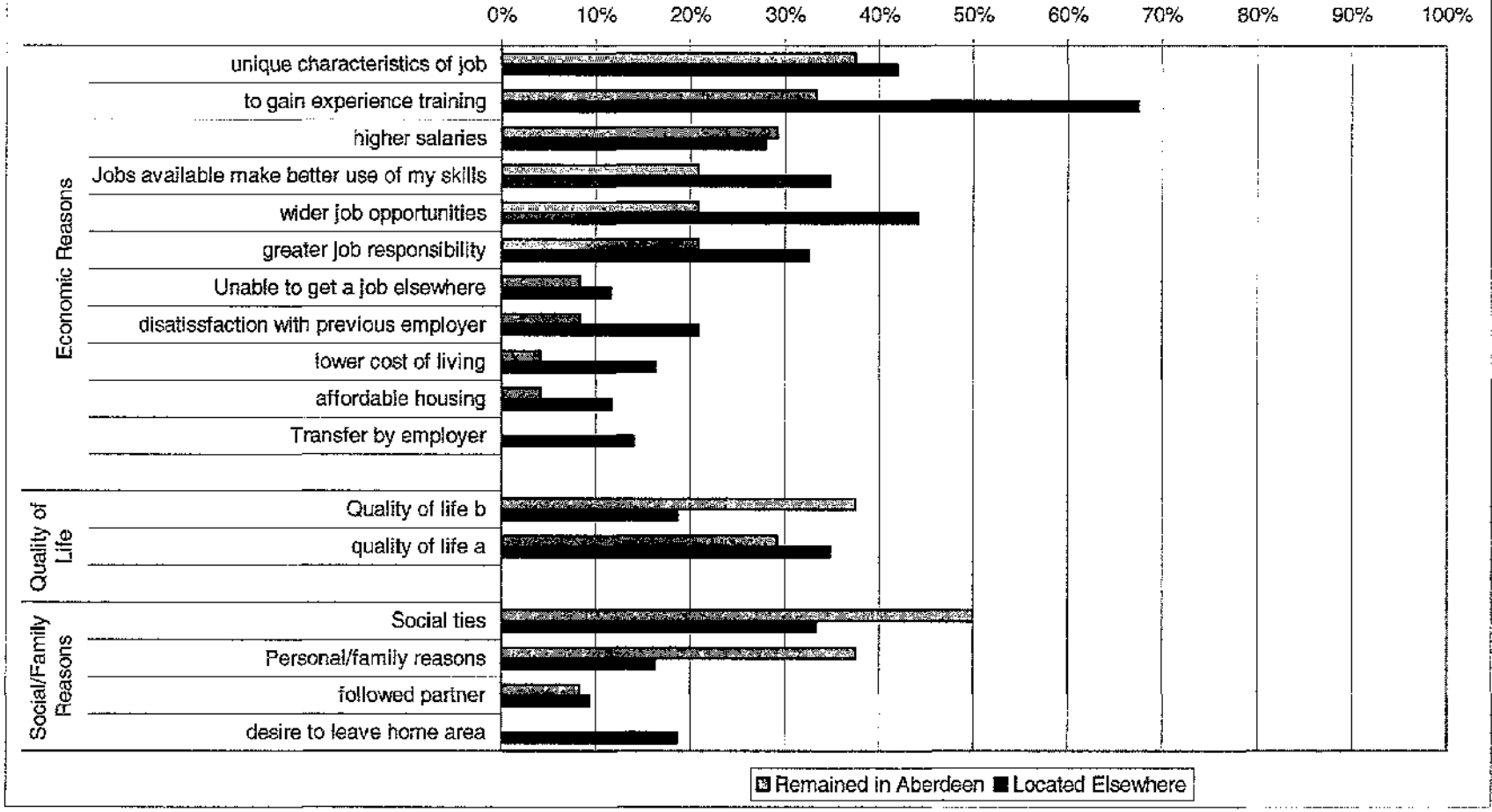


Fig. 7.3.5 Dundee city graduates and the motives considered 'very important' in their decision to remain or to leave the city.

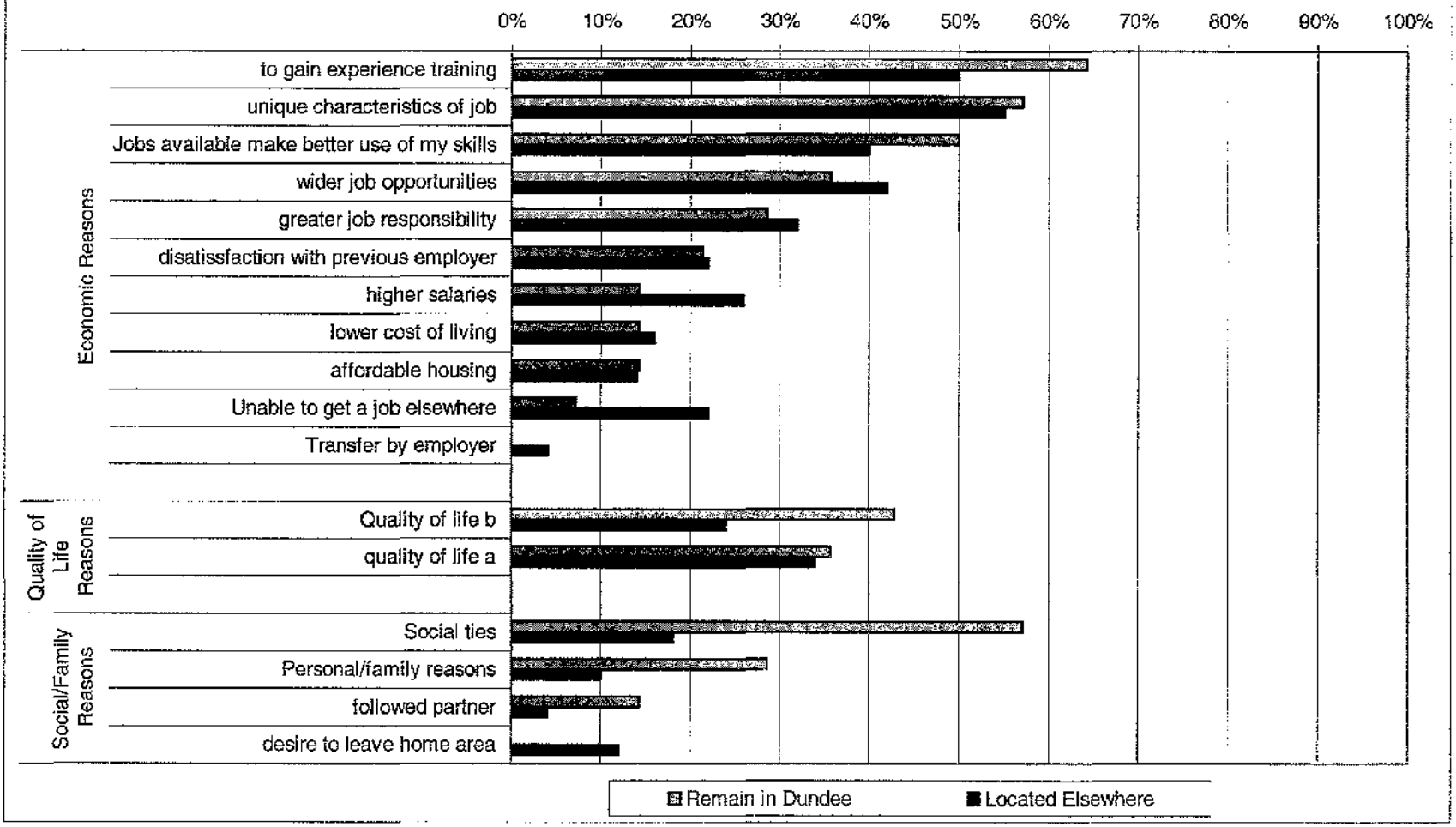
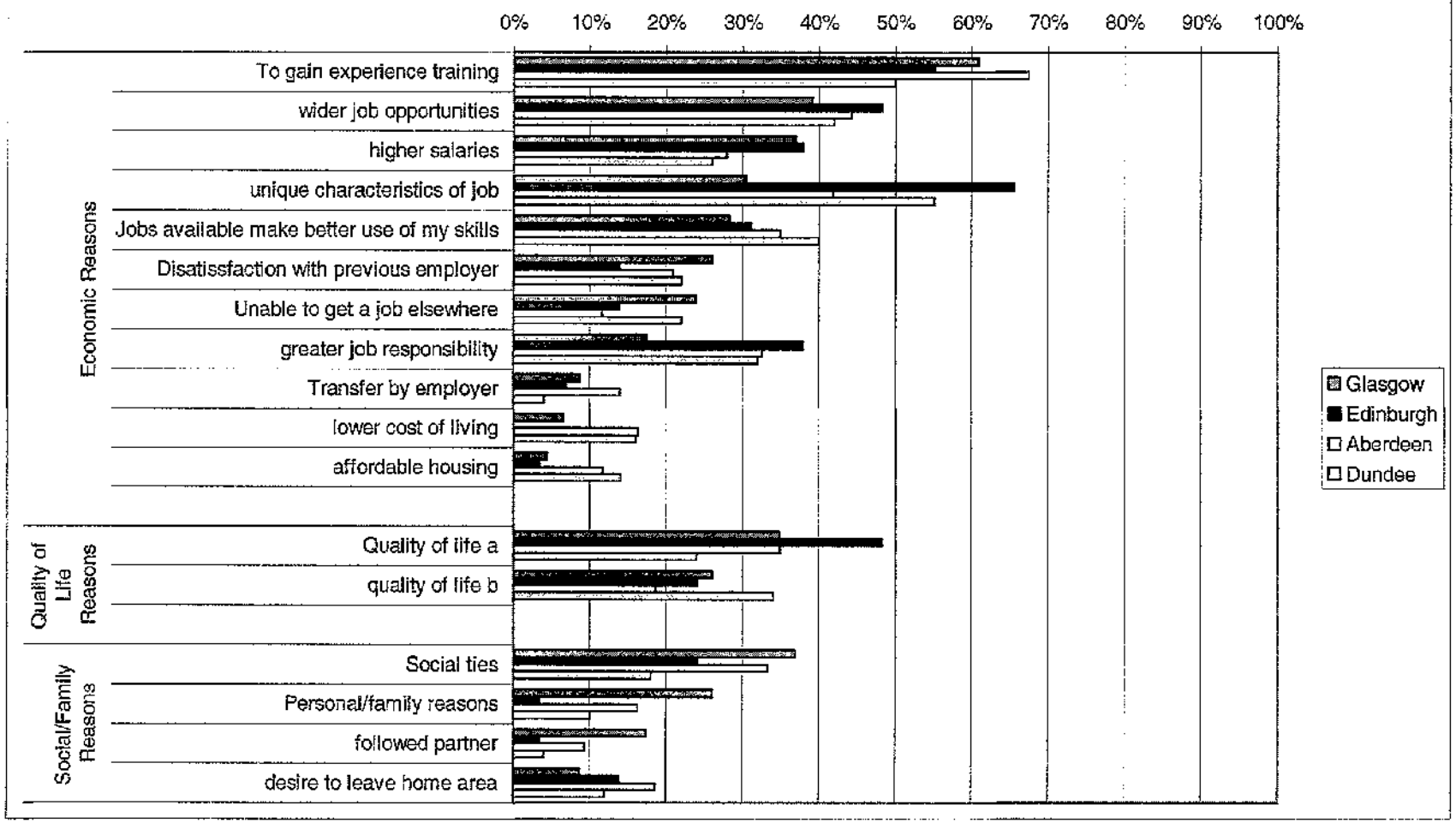


Fig. 7.3.6 A comparison of motives relating to why graduates left their university town.



The findings from the survey suggest that 'opportunities to gain training / experience' remain the most important consideration for all graduates, driving much of their decisions about where to live and work. However, the findings also highlighted some interesting differences amongst graduates who located in different parts of the UK and amongst the recently qualified and older graduates. These typically reinforce the common perception that graduates are attracted to the south east of England because of the associated higher salaries and wider job opportunities. Distinctively and in contrast, social/family ties and 'quality of life' were just as important as economic reasons for graduates who remained in Scotland. This runs analogously with the findings in chapters 5 and 6 which highlighted the high proportion of 'local' graduates who remained within their university town for employment. The findings also suggest that the level of importance placed upon economic motives (particularly those related to career development) and some aspects of quality of life increased amongst the older graduates and those who were more highly qualified as well as over each consecutive relocation. Thus, softer factors such as social/family ties appear to be of greater significance to recently qualified graduates and those who were not out-migrating.

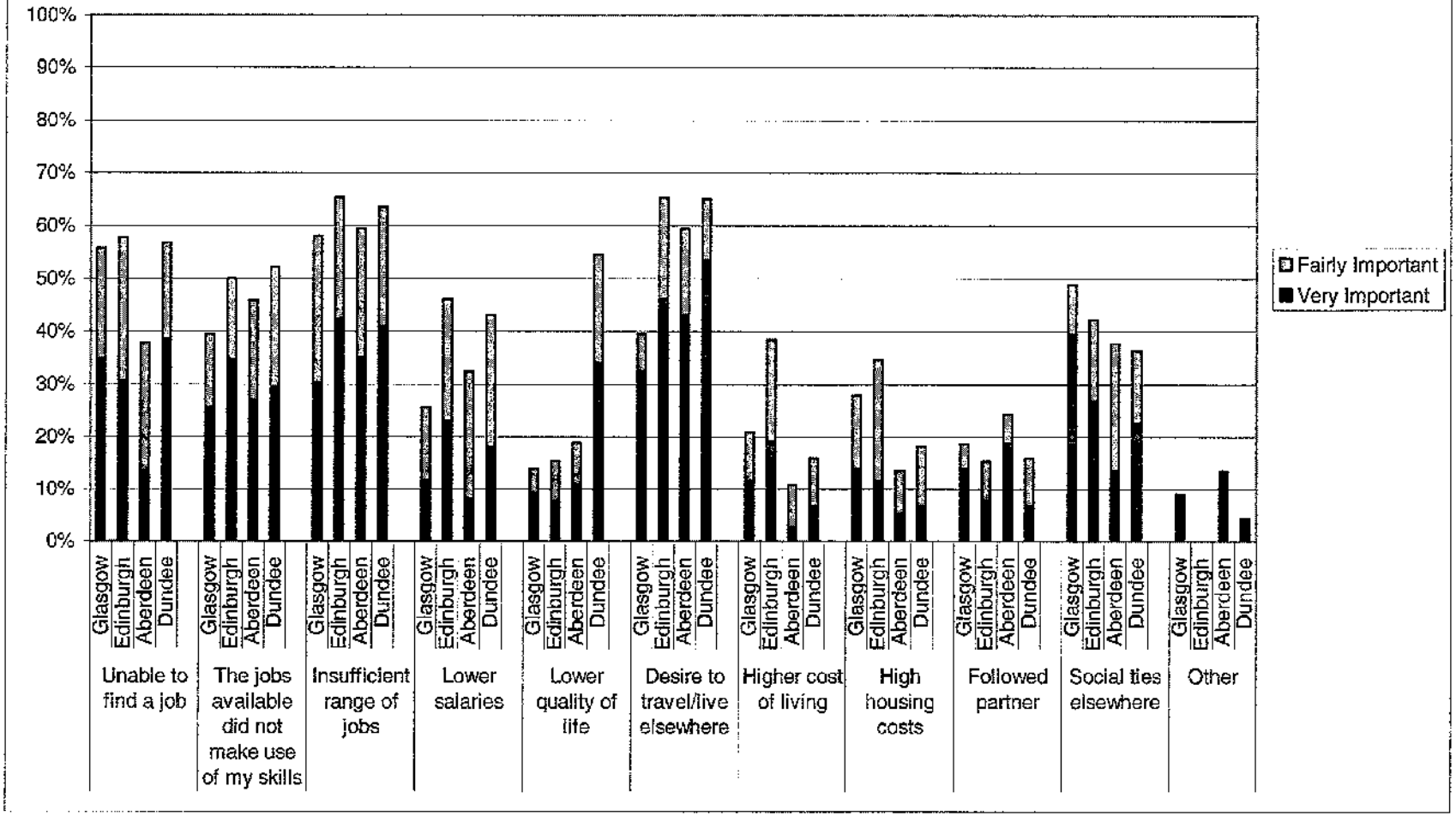
In overall terms, the graduate survey has shown that people move away from an area mainly in pursuit of economic objectives. Softer social and quality of life factors had a greater influence upon graduates who had chosen to remain within their university towns. This appears to confirm the strong effect of *origin* upon graduate retention. The conclusion which can be tentatively drawn is that the 'brain-drain' process is largely driven by economic factors. As such, the desire to reverse the process requires fundamental *economic* development policies rather than policies which focus on quality of life and place marketing as a means to attract 'talent'. Tentatively speaking, this is somewhat contradictory to Florida's influential thesis on the motivations driving the migration decisions amongst the highly skilled 'creative classes' (Florida, 2001).

However, closer examination of the findings from the survey do indicate the presence of subtle 'city effects' which appear to differentiate the motivations amongst graduates from different cities. This is perhaps best exemplified by the

responses from Edinburgh graduates. Clearly, the responses from the Edinburgh graduates indicated a much higher emphasis upon quality of life than from any other group. As such, this is an indication of the existence of a distinctive 'city-effect' upon relocation decisions that may be related to factors that are non-economic. For example amongst graduates that did not consider working in their university towns, Dundee respondents were distinctive in that they rated the quality of life in their university town particularly poorly, citing it as a significant reason which contributed to their decision not to remain for employment there (see Figure 7.3.7 overleaf). As such, the tentative conclusion is that economic factors are the primary drivers in the decision to relocate. Social and family ties clearly have a very strong *retention* effect upon graduates. The quality of life factors played a secondary role albeit to a greater extent in some cities. It is worth noting again that economic factors also appear to have a greater influence in some cities and less so in others. For example, the inability of finding suitable employment was particularly emphasised by the graduates leaving Glasgow and Dundee. Additionally, of the four Scottish cities, the difference in emphasis placed upon economic factors by those who left and those who remained, was the least amongst Edinburgh graduates. In all the other cities, it is clear that those who left placed significantly more emphasis upon the pursuit of higher salaries and wider opportunities. Once again, these subtle differences may reflect the buoyancy of labour markets in different places, the culture and reputation of universities, and as such, the employment outcomes for graduates.

In overall terms, the survey would indicate that economic factors remain the primary reason contributing to any incidence of *brain-drain*. In other words, the survey response from graduates who left Scottish cities indicated that higher salaries and wider job opportunities were the motivational factors. In addition, the extent to which graduates placed emphasis upon these factors differed across respondents from different cities. For example, Edinburgh was distinctive in that graduate respondents placed greater emphasis upon quality of life factors and less emphasis upon higher salaries/access to wider opportunities. In contrast, cities such as Glasgow and Dundee had a much stronger emphasis upon economic factors. This is likely to reflect the labour market conditions in

Figure 7.3.7 Graduates who never considered working in their university-town: reasons why.



different places, as well as the more subtle effects relating to university traditions and reputations and the extent of geographic isolation. The survey results for graduates who located to the south east of England support the findings in chapters 5 and 6, which identified the southern region and Greater London as an exceptionally powerful employment magnet upon the entire graduate population. The responses from graduates who had left Scotland for the South East clearly indicated the pursuit of higher salaries and wider opportunities as the driving force. In contrast, family and social ties had the strongest effect upon those who *remained* in Scotland. Once again, this supports and may explain the strong *local ladder* effect for universities in their localities (as found in chapter 5 and 6).

Chapter 8. Conclusions.

The point of departure for this thesis was the contention that there now exists a new conventional wisdom stating that highly skilled labour are a, if not *the*, key driver of growth in the contemporary knowledge-based economy. This concept is often articulated in terms of the importance of the *knowledge-worker* or *talent* to the competitiveness of firms and even *place* (e.g. Cortada, 2001; Reich, 1991; Florida, 1999 & 2001; Michaels et al, 2001). Leadbeater (1999, pp. 228-229) observes that: 'one of the most powerful groups created are the knowledge workers: mobile, skilled, affluent, independent …who can trade on their expertise and intellectual capital'. As such, in the contemporary period there is a heightened emphasis upon the role of human capital in fostering growth. Current theories of growth often stress the role played by educational investments in increasing the pace of economic growth (see for example NCIHE, 1997). At an organisational level, competitiveness is felt to rest upon finding the right 'talent' for the right job (Michaels et al, 2001). Within the context of place, cities and regions are encouraged to compete on the basis of labour quality and as a result, place-marketing is often targeted at attracting highly-skilled, mobile knowledge workers (Knight 1996). The KE thesis is also noted for an optimistic interpretation for employment expansion in which the demand for skilled labour is set to rise (DTI/DfEE, 2001; DfES, 2003; SHEFC, 2004). Earlier, chapter 2 demonstrated how the higher education sector has been adopted within this narrative. This has brought about a change in the way in which universities are expected to function. They are now under increasing pressure to meet various economic and social objectives in relation to their immediately surrounding region i.e. the third-role agenda (OECD 1999a). The increasing emphasis upon the need to regionalise university activity has also been extended to include the employment outcomes for graduates: 'graduate retention is an important mechanism through which a region can retain people with innovative, entrepreneurial and management capabilities' (OECD, 1999a pp. 62). In turn, this reasoning appears to compliment as well as exploit, the emphasis within the KE thesis for increasing skill levels amongst the workforce and (more recently) their *employability* in a bid to capture an expected expansion in knowledge-occupations (DTI / DfEE, 2001). Additionally, a

number of studies (such as Anselin et al 1997, 2000; Lindholm Dahlstrand and Jacobsson, 2003) have popularised the view that graduates are important for new-firm start ups and the success of hi-tech industries (see also Acs and Armington, 2004; Audretsch and Fritsch 1994; Keeble and Walker 1994; Sutaria 2001).

Chapter 2 contextualised the way in which universities have been adopted as important adjuncts within the KE debate i.e. the third-role agenda. The chapter went on to argue that as the limitations for third-role activity have become clearer (e.g. Boucher et al, 2003) emphasis instead, has shifted towards embodied knowledge-transfer in the form of the graduate population. Universities are now often characterised as a means to attract, develop and retain 'talent' for the benefit of local businesses and regional economies. As such, it would appear that universities across the UK are well placed to meet these objectives. However, at the time of writing, the evidence for this reasoning was limited (see for example Thanki, 1999). Very little is known about the way in which graduates are absorbed into labour markets, especially at a regional level and their impact upon them. The existing studies tend to be limited to examples taken from growth regions and industries (Charles & Benneworth, 1999; Doutriaux, 2003). This represents a significant shortcoming given the contemporary period's emphasis upon attracting and retaining *talent* for the development of a KE (e.g. Scottish Executive, 2001b & 2000a). As such, the broad objective of this thesis is to go some way towards addressing this paucity of research. The preceding chapters have assembled evidence about the trends in patterns of graduate origin, retention, brain-drain/gain and labour market outcomes across broadly defined UK regions as well as the cities within them. In addition, the final analysis (in chapter 7) pertains to the factors which most influenced graduates when making decisions to relocate. A particular distinction was made between *economic* and *quality of life* factors in order to asses the extent to which the findings reflect the contemporary period's prioritisation of the latter (for the most influential proclamation on place differentiation / attractiveness as a means to attract knowledge workers see Florida 2001).

This chapter summarises the main findings from the analysis. It is divided into three sections, in keeping with the form of the research throughout: Regions, Cities and Motives. For each section, the five research questions are considered and some significant (if somewhat tentative) conclusions are drawn. As a timely reminder, the research questions are:

1. What are the patterns for graduate retention across different parts of the UK?
2. What are the characteristics of graduates retained within each region / city and their labour market outcomes?
3. Do regions and cities experience a net loss in graduates with specific skills?
4. What role do the universities in each city play in their local labour market?
5. What factors influence graduates when deciding where to work?

The research questions above are raised within the context of development towards a KE (as discussed in the literature review) and the contemporary period's emphasis upon the importance of skills, especially graduate skills, within this agenda. Considering the first research question, this thesis indicates that the system of higher education in the UK is already highly regionalised. In other words, graduate origin and final destination were very much *self contained* within the regions themselves. This is a positive outcome indicating that there is a large pool of educated labour from which to engender processes of endogenous growth as emphasised within the KE rhetoric. For example, the OECD (1999a, pp. 62) has stated that 'graduate retention is an important mechanism through which a region can retain people with innovative, entrepreneurial and management capabilities' (see also Scottish Executive 1999, 2000a, 2001b). On this basis, the regional return to public & private investments into HE is surprisingly high. On first inspection, this finding appears to contradict the widespread concerns over the loss of graduates from peripheral to core economic areas e.g. the OECD (1999a, pp 65) states:

> 'There is a strong tendency ....for graduates to be pulled towards core economic regions and cities...It is vital that HEIs in peripheral regions retain a fair share of skilled graduates in the region otherwise they risk becoming net importers of students

and also net exporters of graduates and as a result function as regionally disembedded educational providers' (see also DTI, 2001).

The research findings also identified universities as having a strong reinforcing labour market role within their immediate localities. This finding is relevant to research question 4 which seeks to ascertain the labour market role for universities within their city and wider region, thereby presenting a new way in which to conceive of their contribution to the third role agenda. The discovery of the strong reinforcing labour market role was dubbed as the *local-ladder* effect wherein the dominating function for universities was to train a largely local population for employment within local labour markets. This, in a sense, presents the positive labour market effect of universities upon their regions highlighting their influence in the functioning of local labour markets in a way which has not previously been documented. Cities too benefited greatly from the reinforcing labour market effect of the universities located within them. The cities included in the analysis all benefited from a net gain in graduates remaining for work. Although, it can be considered axiomatic that universities have a role in contributing towards the needs of the labour market, this research focuses attention upon the urban & regional dimension of this process, which extends the analysis beyond *national* skills requirements. As such, the discovery of a strong *local-ladder* effect is a positive outcome which emphasises the importance of the regional market place for universities, in terms of student origin and graduate recruitment. This is suggestive of the increasing diversity in graduate employment which in turn, validates the inevitability of increasing employer and regional relevance in the system of higher education (e.g. Goddard in the OECD (1999a) advocates the targeted regionalisation of academic curricula in order to ensure local employer relevance and graduate employment).

Although the analysis confirmed a net loss (brain-drain) in graduates from northern Britain towards the south east of England, it also highlighted the marginal nature of this phenomenon. Hence the response to research question 3 is a mixed one. The findings indicate a lack of awareness about the extent of regionalisation within the higher education system and resultantly, a somewhat

exaggerated picture for graduate loss (as in DTI, 2001; Scottish Executive, 2000a; OECD, 1999a). Nonetheless, this research did confirm a net loss in graduates with 'key' skills from Scotland and the north of England. These were the applied science graduates considered most important to the development of a high-tech knowledge based economy (as emphasised in Scottish Executive, 2000a & 2000b). However, it remains a moot point as to whether this net loss is a rational response to employment conditions at the point of departure and destination. In other words the extent to which these graduates can be retained is likely to depend upon the robustness, diversity and size of the regional economic base[14]. Once again, this corroborates criticisms targeted at the way in which skills are handled within the KE debate, especially the continued emphasis upon the need to increase the supply of skills to meet an expected expansion in knowledge-occupations (e.g. DFES, 2003). Thus, the findings from this research confirm that the *demand* for skills in an economy remains the most critical factor in development towards a KE. This confirms the short-sightedness within much of the KE rhetoric thereby substantiating critiques (such as to be found in Brynin, 2002; Battu & Sloane, 2000) of the view that the demand for skills in the UK is booming. Clearly, the interpretation for employment expansion within the concept of the KE continues to pose difficulties and contradictions despite the concept's wide spread adoption into mainstream thinking.

Within the context of the consensus view for a knowledge-based economy, these initial findings point to an overall positive outcome for regions and cities indicating that the UK system of higher education is well placed to meet the predicted expansion in jobs requiring at least a university degree (DFES, 2003) and that 'peripheral' areas are not experiencing an exodus in graduate numbers. In other words, the regional return to private & public investments into HE are surprisingly high as would not be expected given the heightened emphasis upon the need to stem graduate loss from regions (as suggested by DTI, 2001; Scottish Executive, 2000a). However, closer examination of the data highlighted some important differences between the north and south as well as between the cities that were included in the analysis.

[14] Admittedly, the analysis was not extended to include these aspects and therefore, this remains an area for further research.

Firstly, it is important to bear in mind that Greater London and the south east continued to exhibit the most favourable outcomes under all categories, confirming the distinctiveness and size of the region's economy as would be expected (Turok & Edge, 1999). Greater London and the Southeast were the only locations which experienced a brain-gain in graduates and which functioned as employment magnets, confirming the *escalator* role of the region (Fielding, 1992). On the other hand, there was significant evidence for graduate *underemployment* in some northern cities[15], with up to 40 % of graduates in non-graduate employment (this is discussed in more detail within the cities section of this chapter). Once again this represents a mixed response to the second research question which aims to consider the labour market outcomes for graduates in different places. For these cities, the findings from this research raises the possibility that the increase in graduate numbers has not filtered across the industrial and occupational structure in ways that would be expected if the KE thesis were correct. As such, claims about an increase in the demand for knowledge workers and the political rhetoric calling for more graduates to remain within regional labour markets appear to require further clarification (this refers in particular to the assertions about labour market expansion as posited by DTI/DfEE (2001)). It appears that labour market outcomes for graduates in some places are poorer and / or the range of employment is limited (especially an over-reliance on public sector and non-traded sector employment). Tentatively speaking these results can be interpreted as confirming the non-pervasiveness of the KE and the mistaken view for employment expansion as some authors have already commented upon (Battu & Sloane, 2000; Brown, 2003; Markusen, 1999). The fact that underemployment appears to be worse for some cities rather than others, highlights the importance of considering the demand for skills as well as incorporating wider factors such as the size, diversity and robustness of urban / regional economies and even the social construction of graduate labour markets. Thus, the evidence for underemployment corroborates the calls for more emphasis to be placed upon demand side issues rather than supply when considering development towards a KE (Keep, 2004; Pryor & Shaffer, 2000). This research has provided evidence for this while highlighting the place-

[15] In particular Greater Glasgow and Tyne & Wear.

specificity of under-employment. Therefore, for graduates, the decision to leave an area may be a rational response to labour market conditions at the point of departure as well as destination. This calls into question the logic behind attempts to increase graduate retention within peripheral areas (OECD, 1999; Scottish Executive 2000a).

The tentative conclusion from the analysis is that there is little to indicate a major problem with the loss of graduates from peripheral regions (in the short term at least) but rather, that there are variations in the labour market experience for graduates in different places. Labour markets in some parts of the UK have not absorbed the increase in graduate numbers in ways that would be expected if the KE thesis were correct and all pervasive. As such there is a tendency towards under-employment and over-qualification especially in some northern cities. The evidence collected from this research supports the counter-arguments which criticise the KE thesis for the lack of attention paid to demand side issues when considering the role of skills. This is made more noteworthy by the findings from the graduate survey which indicated that graduates are strongly influenced by complex career aspirations and economic motives during their transition into the workforce. This in itself is interesting given that the evidently high career aspirations amongst graduates sits uncomfortably with their labour market experience in some parts of the UK. This finding challenges the assumptions that are made within the KE rhetoric and adds to a growing body of work which argues that the concept of a KE does not offer a new solution in the race to maintain competitive advantage, but rather, throws into sharp relief the problems inherent within the discourse (e.g. Brown, 2003; Keep, 2004). Furthermore, the findings from this research would suggest that any policies which aim to attract and retain 'talent' will have to encompass fundamental economic issues which go well beyond increasing job numbers alone or the quality of life in an area. The findings from this thesis also challenge the notion that 'talent' can be primarily attracted by quality of life factors (as is increasingly prevalent in contemporary reasoning e.g. Florida, 2001). The remaining part of this chapter considers the conclusions as highlighted above in greater depth and at each level of geographic analysis.

Differences between regions.

In chapter five the analysis for each UK region (Scotland, the north of England and the south of England), highlighted the 'self-contained' nature of student recruitment and final employment destination. In overall terms, for each region, at least three quarters of all graduates were originally from within the region itself and at least 70% of all graduates remained within the region for employment. The extent of the 'self-containment' was especially strong for the south of England. This initial finding highlights the significance of the *local* population of students for each region and confirms the trend towards an already regionalised system of higher education. The initial finding also serves to highlight the sheer volume of graduates remaining within regional labour markets after a period in higher education. Given the concerns over a *brain-drain* to the south, this is a highly positive finding for Scotland and the north of England. In fact it would appear that the universities in these regions are not strictly a route through which graduates are lost but rather, that the universities in these 'peripheral' regions performed a reinforcing labour market role by training a large proportion of locals, the majority of whom remained for employment afterwards. This is a somewhat unexpected characteristic as it appears to have been largely ignored within the literature which so far has proselytised over the need to regionalise the system of higher education and to increase graduate retention especially in more peripheral areas (DTI, 2001; OECD, 1999a).

Although the intake and destination of graduates for each region has been shown to be highly 'self contained', gross retention was found to differ according to the origin of the graduates themselves. Expectedly, 'local' graduates (those from within the region itself) were the most likely to remain for employment after their studies. The gross retention of graduates within each respective region was very high for 'local' graduates (over 80% in all cases). This highlights the very significant and positive *local ladder* effect of the HE sector across all three regions. However the retention of 'external' graduates (graduates originally from areas outside the region of study), was particularly low for Scotland and the north of England. Only one – third of external graduates remained for

employment in northern Britain. In contrast, the gross retention of external graduates in the south of England was exceptionally high, with over two-thirds having remained there for employment. These findings confirm the existence of a 'temporary training ground' effect amongst non-local graduates in areas of northern Britain and the 'employment magnet' effect in the south. This finding highlights the distinctiveness of the south of England in comparison to the north. The former appears to be able to incorporate non-local graduates into its labour market with ease. This is most likely to reflect the buoyancy of the labour markets in the south-east of England. Although this finding emphasises a key difference between the north and south, it still remains that the highly regional ('local') intake and subsequent retention of students in Scotland and the north was of greater magnitude than the loss of graduates from these regions. Overall, only southern England had functioned as an 'employment magnet' for graduates regardless of origin and therefore experienced an entirely 'positive' outcome. However, the findings for the north are mixed and therefore not entirely negative since their dominant function was to function as 'local ladders' for the majority of graduates and as a 'temporary training ground' for a minority of external graduates.

The next stage of the analysis considered the characteristics of graduates retained and employed within each region. This enables the labour market experience for graduates in each region to be considered in light of the consensus view regarding employment expansion within the context of a KE (as discussed in the literature review). The investigation into the characteristics of graduates retained within each region revealed minor variations in the overall employment rate. Between 75% and 80% of the graduates retained within each region were in employment and the remainder were continuing into further study. Therefore the overall rate of employment amongst graduates retained across all three regions was similar. However, many variables suggested a higher incidence of *underemployment* in the north of Britain. Scotland had the highest proportion of graduates in part-time employment (10% of graduates in Scotland compared to 5% in the north and south of England respectively). In addition, up to one-third of graduates retained in Scotland and the north of England were in non-professional occupations, compared to about one-fifth of

graduates retained in the south. The analysis points to a regional variation in employment outcomes amongst graduates retained in different places. The experience of employment appears to be somewhat 'poorer' for a significant proportion of graduates retained in the north of Britain. In light of this, the emphasis placed upon the continued need to increase levels of graduate retention, especially in peripheral areas, in the expectation of an increase in knowledge-based occupations is questionable. It would appear that there is a pressing need to address issues that go beyond graduate retention and/or the expansion in job numbers alone. That is to say, the *quality* of projected employment expansion in the regions in relation to the expansion in graduate numbers emerges as a key issue. Otherwise the drive to expand, and to regionalise HE even further is unlikely to complement the skill requirements within regional labour markets as they currently stand.

The next stage of the analysis considered the industrial sector in which graduates were employed. There was some variation in the industrial composition for graduate employment across the three regions. For example, the public sector was responsible for employing around two-fifths of the graduates retained in Scotland and the south of England respectively. This figure was higher for graduates retained in the north of England where nearly half were employed by the public sector. This indicates that, of all the three regions, the north of England is especially reliant on public sector employment, although the proportional differences amongst the three regions is not as accentuated as may have been expected.

Finally, the subjects studied by graduates retained across all three regions did not exhibit a significant amount of variation. However, the analysis of qualifications highlighted a much higher proportion of post-graduates amongst those retained in the south than anywhere else. Nearly three in every ten of the graduates remaining in the south for employment had a second degree compared to only one in ten for the north. This may reflect a greater level of employment opportunities in southern regions for those with higher levels of skill. Once again, this is an indicator which may be considered to reflect negatively upon the stock of high-level skills in the north and Scotland.

The analysis of brain-drain /gain confirmed an overall brain-drain from Scotland and the north of England. The brain drain from the north of England was equivalent to a net loss of 5% of the local graduate population. The figure for Scottish brain drain was a loss equivalent to 4% of local graduates. The relatively low levels of 'brain-drain' from the north and Scotland serves to highlight the over-exaggeration in accounts of graduate loss from peripheral regions which, so far have failed to consider the *net* effect of graduate inflows and outflows (see for example DTI, 2001). However, it remains important to bear in mind that the net losses may have significant cumulative effects over time. In contrast, the south of England was the only region to have retained a high proportion of non-local graduates. Therefore, the south of England had experienced a brain-*gain* equivalent to a 9% expansion in graduate numbers. The quantifying of graduate brain-drain in this way has taken into consideration graduate origin and provides a more accurate picture of graduate loss from the north of Britain which consequently has been shown to be relatively small in comparison to the graduate population overall.

The next stage of the analysis into brain-drain was to identify the net loss in graduates according to their specific characteristics. The aim of this was to identify the subjects and qualifications in which each region had experienced particular problems. The first graduate characteristic to be analysed, in terms of brain-drain/gain, was the subject studied. The findings from this analysis highlighted a number of interesting points. Firstly, the origin profile for graduates from each subject group and in each region was largely dominated by a 'local' (i.e. from within the region) population. This suggests an already regionalised system of higher education across most subject areas. In terms of overall brain-drain/gain, Scotland and the north of England had experienced a brain-drain in all subject areas (the only exception was Medicine, in which the system of hospital placements appears to limit out-migration). In both cases, the brain drain was strongest amongst Applied Science graduates. The brain-drain in Applied Science graduates from Scotland and the north of England amounted to approximately 15% of local Applied Science graduates in each case. This group also appeared to be amongst the most 'mobile' i.e. most likely to leave the

region in which they had studied. These findings confirm the concerns over the loss of 'key' graduates from the periphery. Given the emphasis placed upon the significance of graduates in the Applied Sciences for the development of a high-tech/high-skills economy in much of the KE literature and in regional policy rhetoric; the loss of these graduates indeed appears to have potentially negative consequences. However, the extent to which this is realistically detrimental to regional economies can be considered a moot point. The greater incidence of Applied Science graduates leaving the northern UK regions may simply be a rational response to the existing labour-market and employment conditions at the point of departure and/or destination. This point raises the question as to whether capital follows labour or visa versa. Thus the findings confirm a significant brain-drain in Applied Science graduates from Scotland and the north of England. In contrast, southern England was distinctive in that the region had experienced a brain-*gain* across all subject areas confirming the magnetic pull of this region across all categories of graduates.

Although, Scotland and the north of England had experienced a graduate brain-drain in a number of 'key' subjects; the HEIs in each region still performed a very important role as 'local ladders'. In other words, the HE sector in each region had retained the majority of *local* origin graduates in each discipline for employment within *local* labour markets. This function cannot be overlooked since it is a dominant feature of the HE sector in the north of Britain. Therefore, local-labour markets in peripheral regions benefited from a large proportion of trained local graduates remaining to take up local jobs. In contrast both Scotland and the north have been confirmed to function as 'temporary training grounds' for external graduates in all subject areas. Thus, the local labour markets in Scotland and the north of England did not benefit from a large proportion of additional non-local graduates remaining for employment. In complete contrast to northern Britain, the south of England was the only region to have experienced a strong 'employment magnet' effect across all categories of graduates including all subject areas and levels of qualifications. For example, over two-thirds of all external first-degree and postgraduates remained in the south for employment. In contrast, less than two-fifths of external first-degree and postgraduates remained in the north of Britain. Thus, the north of Britain

functioned as a temporary training ground for external graduates with first degrees and for those with higher levels of qualification. However, the positive finding was that HEIs in all regions had functioned as strong 'local ladders' across different levels of qualifications. The effect was considerably stronger in the south (over 95% of locals were retained) and largely uniform across Scotland and the north of England (just over 80% of locals were retained). The net effect of the outflow in locals and the retention of external graduates resulted in marginal brain drains for Scotland and the north of England. In Scotland the brain drain was slightly larger amongst first-degree graduates whereas in the north of England it was slightly larger amongst the post-graduates. In contrast in southern England, there were brain-gains in both categories of graduates. If this trend is repeated cumulatively over a number of years, the larger brain-drain of postgraduates from the north can also be interpreted as potentially detrimental to the stock of high level skills in the region. Once again, the south of England was the only region to have functioned as a strong 'employment magnet' for external graduates across all subjects and qualifications. In Scotland and the north of England, universities had functioned as significant 'local ladders' having retained at least three-quarters of local graduates in each subject area; but for external graduates they fulfilled a role as 'temporary training grounds'.

The analysis into the effect of university 'type' on regional graduate inflows and outflows highlighted some important, if only expected, trends. In all cases, both old and new universities functioned as strong 'local ladders', retaining the bulk of local graduates for employment within the region. However, it appears that the older universities were more significant conduits through which local graduates were lost. This was especially the case for Scotland and the north of England, where local graduates that had attended an older HEI were twice as likely to leave the region, than if they had attended a modern, post 1992 university. Once again, only the universities in the south had functioned uniformly as employment magnets regardless of the type of institution.

In overall terms the initial analysis into the characteristics of graduate origin, destination and brain-drain/gain at the level of the region has confirmed a small net loss of local graduates from northern Britain and a net gain to the south.

More significantly, it appears that the net loss was particularly prevalent across 'key' groups, such as Applied Science graduates and postgraduates. In addition, the analysis also uncovered variations in the employment outcomes amongst graduates retained in different regions. The north of Britain appeared to have a greater diversity in the pattern of graduate employment reflected by the higher proportions in part-time and non-professional occupations. This may be regarded as a higher incidence of underemployment. In addition the north of England was shown to have been particularly reliant upon the public sector for graduate employment. Nonetheless, the initial analysis highlights the substantial 'local-ladder' effect of HEIs in Scotland and the north of England which resulted in a strong gross retention of graduates within these regions. This presents a highly positive and significantly different picture to that which is often portrayed. It appears that the system of higher education is already highly regionalised and that the peripheral regions of northern Britain did not experience a large scale graduate exodus. Rather, the local HEIs had very positive and reinforcing labour market roles especially amongst the local graduate population which represented a far larger population than external graduates. However, this finding may be limited since the data only captures the destination for graduates at an early stage and does not reflect later migration patterns which may begin to be influenced by the desire for career progression and higher financial rewards (as suggested by the findings from the postal survey of graduates). This is a point returned to in the latter part of this chapter.

Differences between Cities.

Chapter six repeated the analysis for graduate origin, destination and brain-drain/gain, but at city level rather than broad region. The analysis highlighted significant differences amongst cities in the UK particularly in employment trends. The most positive outcome from the city analysis was the important labour market role that universities in each city had performed. In overall terms, they functioned as strong 'local ladders' training a significant proportion of local graduates who subsequently remained for employment in the city. This was reflected by the strong levels of brain-gain experienced in all cities.

Cities displayed highly individual characteristics in terms of their graduate-origin profiles. At one extreme, Glasgow and London were characterised by a highly localised population of graduates. In contrast Edinburgh, Dundee, Aberdeen and the northern English cities were dominated by a non-local population of graduates who came from areas beyond the greater city area. This reflects the different recruitment traditions at HEIs in different cities as well as the population within the cities themselves. In terms of *gross* retention, the cities in the north of England, Aberdeen and Dundee retained less than half of all their graduates. Under these terms London, Glasgow and Edinburgh were the most effective at absorbing graduates from their local universities for employment. However, this can be considered to be an over-simplification of the processes involved. Limiting the analysis to gross retention in this way fails to take into account (amongst other things) the nature of student intake at universities in each city as described earlier. Since local graduates are more likely than non-locals to remain in the city of origin, those cities with a high proportion of local graduates are likely to have benefited from a high level of gross retention subsequently. Similarly, those cities with a high intake of non-local students are likely to have experienced low levels of gross retention, having functioned more strongly as temporary training grounds. For this reason, before coming to any conclusions, the characteristics of the student intake in each city had some bearing upon the outcome for graduate retention.

Universities in each city had the important function of acting as *local ladders*, training and retaining the majority of local-origin graduates for employment within the city. This was a defining trait for all the universities in each city. However, the extent to which universities functioned in this way was influenced by their student profiles. Therefore, cities with a predominantly non-local student population were predominantly *temporary training grounds* although they still acted as strong *local ladders* for a small local student population. Thus, Glasgow and London, with their very high local population of students, were exceptionally strong local ladders, training and retaining a large proportion of local young people. Over half of the students originated from within the cities themselves and less than one-fifth of these students actually left Glasgow or

London after graduating. The northern English cities, Aberdeen, Dundee and Edinburgh also functioned as strong local ladders, retaining the majority of their local students (less than one-third of the locals left these cities for employment elsewhere). However, given the high proportion of students from outside the city boundary, their dominant feature was as temporary training grounds.

Thus in terms of the retention of external graduates, the northern English cities, Aberdeen and Dundee performed particularly weakly. These cities were clearly *temporary training grounds* for all non-local graduates, with less than one-third having remained there for employment. Therefore, the *temporary training ground* effect in these cities was significantly greater and more pronounced.

In fact London was the only city to have had any significant *employment magnet* effect upon external graduates with approximately half remaining for employment there. Glasgow and Edinburgh followed London with around two-fifths of external graduates having remained for employment. Thus in terms of retaining external graduates for incorporation into local labour markets, London was the only city to have exhibited this magnet effect; the northern English cities, Aberdeen and Dundee were the weakest under this category and Glasgow and Edinburgh occupied a middle ground. The findings for Edinburgh deserve further comment given that the city's student profile was amongst the least self-contained i.e. nearly three quarters of the students at Edinburgh were from beyond the city whereas in London and Glasgow, less than half were from areas beyond the city. Therefore, Edinburgh appears to have been unique in having been the only city to have had a high population of external graduates and to have experienced a relatively strong gross retention amongst them. In other words, the relatively high gross retention of graduates in Edinburgh was the least dependent upon the size of the existing local population of students (as in Glasgow and London). This would indicate that there are factors related to the characteristics of cities, other than graduate origin, which may have an effect upon levels of retention.

Finally, in terms of graduate brain-gain, all cities benefited from a net gain in graduates. This highlights the positive nature of the HE sector in all cities

particularly as a source of skilled labour for local labour markets. West Yorkshire and Edinburgh experienced the strongest brain-gains, nearly doubling their population of local graduates through the retention of external graduates. This highlights the significance of non-local graduates to the labour markets in these cities. Aberdeen had the lowest figure for brain-gain followed by Glasgow and Manchester. This highlights the greater significance of the local graduate population to the labour markets in these cities.

Overall, the ability of cities to retain graduates appears to have been strongly determined by graduate origin. The majority of students in most cities seem to have returned to their place of origin after graduating. Consequently, the cities which attracted a lot of 'external' students tended to have lost a lot of them after they had graduated. The only exceptions to this were Edinburgh and West Yorkshire, perhaps reflecting the recent buoyancy of the labour markets in each. Therefore, this implies that attracting more students from beyond the conurbation does not necessarily lead to more staying on afterwards. Having said this, cities such as Edinburgh (which had a large non-local student population) retained a significantly large proportion of external students for employment after graduation, thereby experiencing a sizeable brain-gain. Compared to Edinburgh, the *employment magnet* effect was not as strong in other cities with a similar proportional intake of external students (e.g. Manchester, Merseyside and Tyne & Wear). This strongly suggests that there may be a 'city effect' incorporating factors, other than origin, which may have a bearing upon graduate retention.

The rates of graduate retention in cities also varied slightly according to graduate qualifications and the type of university attended. It appears that local graduates with postgraduate qualifications were more likely to have left their origins. This is important given that most discourses about the need to reverse skills shortages are directed towards what is clearly a more mobile group of individuals. In addition, the data identified the 'older' pre 1992 universities as having had a greater 'spring-board' effect for local-origin graduates. In other words, local graduates were more likely to have left their hometowns if they had attended an older university rather than a modern HEI. This may reflect different

university traditions, reputations and recruitment traditions with nationally-based companies.

Overall, universities in each city had performed positive labour market roles. They trained locals, the majority of whom remained for employment within the local labour market. Additionally, each city experienced a brain-*gain* in graduate numbers. However, closer examination of the employment trends amongst graduates retained in different cities revealed some significant variations. Graduates are absorbed into the local labour market in each city in a variety of ways. Most graduates continued into employment, with a sizeable proportion continuing into further study as well. Nearly two-fifths of graduates retained in Aberdeen, Dundee, Greater Manchester and Greater Glasgow were continuing into further study. London and Edinburgh had the lowest proportion of retained graduates continuing into further study (just over 20%). If continuing into further study is considered to be a response to the unavailability of suitable employment as some would suggest, then the high proportion of graduates continuing into further study in Glasgow, Aberdeen, Dundee and Greater Manchester may have somewhat negative implications.

In addition, for some cities a sizeable proportion of retained graduates went into jobs which would not conventionally have been considered part of the economic base. For example, over two thirds of all graduates retained in Dundee and the northern English cities were employed either in local public services or in non-tradable services. Employment in public services was particularly prevalent amongst graduates retained in Merseyside where nearly 60% were employed by this sector. Glasgow, Aberdeen and Edinburgh had the lowest proportion of graduates employed in local public services (approximately one-third). However, Glasgow had the highest proportion of graduates employed in non-tradable services (around 25%). In contrast, the results for Edinburgh and Aberdeen indicated that nearly half of all retained graduates were employed in the externally traded sectors. This was followed by London and Glasgow, where approximately one-third of all retained graduates were employed in the externally traded sectors. The most evident trend which emerged from the analysis of employment by sector was the dominance of the public sector for

graduate employment in the northern English cities and Dundee. This indicates a weak private sector and possibly narrow employment choices for graduates retained there. Therefore, if the increased regionalisation of HEIs and improved graduate retention is to be an objective, issues such as these are likely to require closer scrutiny. The employment outcomes for graduates, quite clearly, differ across cities.

There is further evidence for graduate underemployment from the proportion of graduates working in non-professional, part-time and unpaid employment. Glasgow in particular had the highest proportion of graduates in non-professional jobs. Nearly two-fifths of the employed graduates retained in Glasgow were in non-professional occupations. Glasgow also had amongst the highest proportion of graduates going on to further study. Approximately one-third of the graduates retained in West Yorkshire and Tyne & Wear were in non-professional employment. In the remaining cities, employment in non-professional occupations was between 25% and 30%. Thus, the employment outcome for graduates across the UK appears to differ significantly, with cities such as Glasgow continuing to exhibit the most variable outcomes. Overall, it would appear that a sizeable proportion of graduates are not employed in jobs that typically require 'graduate skills' and this trend appears to be more evident in northern Britain.

The factors affecting graduate retention in cities are not easily identifiable. The cities included in the analysis were clearly different under a number of variables examined. From the distinctive 'employment magnet' results for Greater London, it appears that the sheer scale and diversity of the economy is an additional and significant factor. The trend in employment growth is also a likely factor affecting the extent of graduate retention within cities. Amongst the northern English cities, West Yorkshire has been the only city to have experienced a sustained expansion in employment. Compared to other northern cities, West Yorkshire had amongst the highest retention figures amongst both local and non-local graduates. A study by Turok and Edge (1999) also identified many of the smaller free-standing cities including West Yorkshire and Edinburgh, as having performed more favourably than the larger

conurbations in terms of employment expansion. Between 1981 and 1996 Leeds experienced an 11% increase in jobs and in total, the surrounding conurbation of West Yorkshire experienced an approximate 5% increase in employment during the same period. Similarly, Edinburgh experienced a 10% increase in employment. In contrast, Merseyside experienced a sustained downward trend during the same period.

The positive labour market trends in West Yorkshire and Edinburgh appear to run analogously to the trends for graduate employment and retention in these cities. Amongst the northern English cities, West Yorkshire had the highest rate of retention for non-local graduates. Edinburgh also had a high rate of retention under this category. The proportion of local graduates that left these cities was amongst the lowest. In contrast, Merseyside and Dundee had the highest proportion of locals that left (approximately one-third) for employment elsewhere. These cities also had the highest proportion of retained graduates employed in local public services. This is indicative of the weakness of the private sector in these cities. Overall, the analysis into graduate retention in cities has shown that London, Edinburgh and West Yorkshire had amongst the highest levels of employment amongst retained graduates. In contrast, Aberdeen, Dundee, Glasgow, Manchester and Merseyside had amongst the lowest levels of employment amongst their retained graduates. Thus, the findings from the analysis into graduate retention are broadly reflective of the trends in employment expansion for many of these cities.

The Turok & Edge study (1999) also indicated somewhat weaker levels of expansion in professional/managerial employment in Glasgow, Newcastle and Manchester as well as zero expansion in this category for Liverpool (although this was for the period 1981 to 1991). In contrast, the growth in professional / managerial employment was particularly strong in Leeds as well as in Edinburgh (there was a 30% increase in professional/managerial employment in these cities over the period 1981 to 1991 in approximate terms). These trends are broadly in keeping with some of the trends for graduate occupations. For example, this research has shown that graduates retained in Glasgow and Tyne & Wear were among the least likely to be in professional employment. This may

reflect a lower rate of expansion in this category as documented by the Turok & Edge study. In contrast, Edinburgh and London exhibited a high proportion of graduates in professional employment. These cities were also shown to have had a stronger expansion in professional jobs between 1981 and 1991.

Although the performance of employment growth in cities is likely to have had some bearing on the levels of graduate retention in cites, this can be best illustrated by Edinburgh and Leeds, it is likely that other factors may be relevant in explaining retention such as cultural factors typified by the traditional pattern of local recruitment, university reputations and possibly quality of life factors in cities. Chapter seven addressed the effect of some of these factors on graduate retention and loss.

Motives influencing decisions about where to live and work.

Chapter seven investigated the motives which had influenced the employment-location choices made by graduates who had studied at Scottish universities. The aim of this was to provide a qualitative and complementary explanation for the earlier, largely quantitative analysis into graduate migration. The overall tentative conclusion from chapter seven is that economic factors remain the most influential motives especially amongst out-migrating graduates. In contrast, social and family ties were more important amongst graduates choosing to remain within Scotland. Issues related to 'quality of life' were secondary in the decision about where to live and work.

For all graduates, irrespective of destination, the desire to gain experience/training was the primary motivation influencing decisions about where to live and work. The most striking variation had occurred between graduates who had remained in Scotland and those who had located to the south-east of England. As would be expected, 'wider job opportunities' and 'higher salaries' were key influences upon the latter group. In contrast, social/family ties and quality of life were amongst the most important influences upon the graduates that had remained in Scotland. This initial finding gives some insight into why graduates may choose to leave the north of Britain and confirms the

dominance of economic factors over 'softer' factors (such as quality of life). Closer examination of the survey responses indicated that perceptions about 'wider job opportunities' and 'higher salaries' were the most influential factors motivating graduates who had located to the south east of England in particular. In addition, the findings from the questionnaire suggest that the importance placed upon economic motives (especially motives related to career progression) became more important over time. Greater emphasis was also placed upon career development amongst the more highly-skilled group of postgraduates. Once again this has important policy implications if graduate retention and the regionalisation of the HE sector is to be a long-term objective. In other words, based upon the responses to the survey, graduates may initially remain within Scotland because of social/family ties and the pursuit of initial opportunities for employment, experience and training. This is reflected in the strong gross retention figures for Scotland in chapter 5. However, the graduate survey suggests that over time these motives diminish in importance and issues related to career progression, higher salaries and wider opportunities become much more important to graduates as they mature. This is also true of graduates with higher levels of skills i.e. those with postgraduate qualifications. The tentative conclusion which may be drawn from these findings would suggest that issues related to the *quality* and *range* of employment opportunities require the utmost attention if the peripheral regions (such as Scotland and the north of England) are to ensure graduate retention beyond the initial short time period following graduation.

Closer examination of the response from graduates that had attended universities situated in Glasgow, Edinburgh, Dundee and Aberdeen revealed some interesting variations. It remained, however, that the desire to gain experience/training was the primary influence upon locational decisions made by all graduates. Graduates that had remained in their 'university towns' appear to have been particularly motivated by social/family ties. However, graduates that had remained in Edinburgh appear to have been additionally influenced by the 'quality of life' available in the city. Less positively, a perceived lower quality of life (in terms of entertainment/ culture) appeared to have been particularly prevalent amongst the graduates who left Dundee. This was the only

occasion when 'quality of life' appeared to have had a significant bearing upon decisions to relocate. In this sense, city image or perception may have some influence upon decisions about where to live and work.

Graduates that left each of the Scottish cities appear to have placed greatest emphasis upon economic factors such as access to wider opportunities and higher salaries. Graduates departing Glasgow, in particular, placed the most emphasis upon the pursuit of higher salaries. Graduates leaving the more peripheral cities of Aberdeen and Dundee expressed the greatest desire to increase their access to wider job opportunities and appeared to be the least concerned with higher salaries. This serves to highlight the different perceptions/experiences of graduates in different cities across Scotland, which may in turn, reflect the existing labour market conditions, geographic isolation and in some cases, the quality of life. In other words, the pursuit of wider job opportunities, higher salaries and career development amongst the out-migrating graduates can be considered to run analogously to the earlier findings in chapters 5 and 6 which identified the higher incidence of graduate underemployment in peripheral regions such as Scotland and the north of England as well as many cities within them.

As has been pointed out earlier, social/family reasons and 'quality of life' were amongst the main reasons why graduates *remained* in Scotland. In fact, they proved to be more influential than many economic reasons for this group. In direct contrast, economic motives were dominant amongst the graduates who had left Scotland. This was especially the case for graduates locating to the south east of England. These findings highlight some interesting points. Not least among them is the confirmation that the south-east had a particularly strong economic attraction for graduates. It would also appear that quality of life is only of particular importance amongst graduates that *remained* in Scotland. On the other hand, for graduates who are out-migrating, quality of life proved little more than secondary to economic motives. This highlights the continuing importance of economic motives over quality of life in the decision to relocate. In particular, economic motives related to career improvement increased in significance amongst the more mobile, older and more highly qualified

graduates. In general, softer factors such as 'quality of life' in the destination area appear to be secondary considerations. Furthermore, quality of life issues related to entertainment venues and cultural activity appear to be more important to graduates than access to nature and outdoor activities. In addition, the findings also suggest that issues relating to the cost of living & housing had very little impact upon the relocation decisions made by the graduate survey respondents.

It appears that both the *quality* and *range* of employment are significant factors influencing out-migrating graduates in their decisions about where to live and work. In other words given that economic factors (many related to career development) remain the primary motive amongst this group; core economic regions remain better placed particularly in terms of attracting the highly skilled. Cities in core regions are more likely to benefit from agglomeration effects which benefit both employer and employee needs. Putting it another way, the concentration of industries, businesses and major graduate employers in core-regions is more likely to provide wider employment choices and greater opportunities for career development. The survey results suggest that wider employment opportunities and higher salaries were a significant influence upon the decisions made by graduates leaving Scotland and locating to core economic regions such as the south east of England. Therefore, these findings may go some way towards explaining the motives behind the incidence of marginal brain-drain from peripheral areas to core economic regions. Given that out-migrating graduates appear to have a demanding set of motivations, the extent to which peripheral regions can increase graduate retention will depend upon more than a simple expansion in job numbers alone. Instead, the survey indicates that economic returns and the quality of employment in an area, are important to graduates.

Once again, the survey results have emphasised the south east of England as exhibiting some of the classical characteristics of agglomeration economies. The strong graduate retention figures and employment magnet effect present in the south east, as exhibited in chapters 5 and 6, along with the survey findings in chapter 7 suggest that agglomeration economies and thick labour markets are

still highly significant in the migratory decisions made by those in the 'creative class'. This is a significant finding given that it contradicts the contemporary discourse which places primary emphasis upon 'quality of life', rather than economic factors, in contributing to the *attractiveness* of any given area to highly skilled and mobile *knowledge workers* (under which graduates are often categorised (see Florida 2002)). The findings from the graduate survey suggest the opposite, whereby economic reasons remain more important than quality of life amongst mobile graduates.

The survey results also clearly identified graduates as a group with a complex and demanding set of economic motives. It would appear that (particularly amongst the highly mobile and highly qualified graduates), economic and professional development are paramount factors influencing decisions to relocate. Therefore, attempts to retain more graduates in the regions especially from beyond the immediate region (a widely publicised intention of devolved government in the UK) would have to consider these economic factors seriously. This is likely to prove a difficult task since, unlike the softer values such as 'quality of life', economic factors such as the quality and range of graduate employment are unlikely to be amenable to change in the short term resulting in, amongst other things, continued and widespread graduate underemployment. In light of this, it would appear to be a rational choice for graduates to move elsewhere in order to maximise their career options.

The main observations from the study have confirmed the existence of a marginal level of graduate brain-drain from Scotland and the north of England, and a brain-*gain* to southern England. This is consistent with the characterisation of Greater London and the south east as a distinctive 'escalator' region (Fielding 1992). However, the study also highlighted the significant and positive 'local ladder' function of the HEIs in northern Britain, an aspect that is often neglected. The high proportion of *local* graduates that remained within the northern regions for employment more than compensated for the marginal outflow in graduate numbers. As such, a major finding is that the UK system of higher education is already highly regionalised. As such the regional returns to public investment into higher education can be considered to

be high given that the dominant function for universities was to train a local labour force. This represents a highly positive outcome for areas of northern Britain, which so far, have often been depicted as undergoing a substantial brain-drain in graduates. Surprisingly, cities within each of the three UK regions were also found to have benefited considerably from a net-gain in graduates remaining for employment. This is especially significant for the more peripheral cities in the north of Britain given their history of economic and population decline. Thus, the patterns of graduate migration suggest that universities had an overall positive and reinforcing labour market effect within UK regions and cities.

Approached from the perspective of the consensus view for development towards a knowledge-based economy; it would appear that UK regions and cities are well placed to benefit from what appears to be an already highly 'self-contained' system of higher education which trains a significant proportion of the local labour force. Under these terms, the regional returns and benefits from the *massification* of HE are high. Furthermore, given the KE's emphasis upon the key role for skills, education and graduate 'talent' in generating organisational and place competitiveness; the initial findings which show a high proportion of graduates being absorbed into local labour markets, suggest that employers across all parts of the UK benefited from the increased stock of human capital. This would appear to be a highly positive outcome and largely in keeping with the dominant discourse on the role of skills in the development towards a high-skills, high value-added economy. However, closer examination relating to the employment experiences amongst graduates in different regions and cities identified a number of important variations. It would appear that the incidence of *underemployment* was highest for graduates that were employed in Scotland and the north of England. With the exception of Greater London and Edinburgh, there appeared to have been a high level of graduate under - employment amongst some of the cities that were analysed. For example, up to one-third of graduates retained in Glasgow, Aberdeen, Dundee, Manchester and Merseyside had continued into further education; approximately one-fifth of the graduates retained in Glasgow and Dundee were not in paid, full-time employment and most significantly, nearly 40% of graduates retained in

Glasgow were in non-professional employment. These findings have serious policy implications in the context of the current debate over the need to regionalise HE even further and the need for targeted graduate retention. It would appear that the labour market consequences for graduates in different parts of the UK vary considerably and in ways that are inconsistent with employment expansion as espoused within the KE thesis. The continued emphasis upon the need to retain graduates within the regions would suggest that there is insufficient acknowledgement of the current extent of regionalisation in the HE sector, as well as a lack of awareness about real variations in the employment outcomes for graduates in different parts of the UK. The latter point is made all the more poignant when considering the findings from the graduate postal survey which suggest that career and economic reasons are key factors for graduates when making employment-location decisions. Tentatively speaking, graduates appear to have a complex set of career and economic aspirations which may not match the labour market realities in some parts of the UK. As such, the demand for graduate skills and the *quality* of employment expansion within local labour markets remains the main point of contention within the KE debate. Clearly the higher education sector is well placed to meet the skill requirements of the KE thesis as discussed in the literature review. However, this research highlights some unexpected variation in the employment outcomes for graduates in different parts of the UK. Clearly, for many parts of northern Britain, graduates have not been absorbed into labour markets in ways that would be expected if the consensus view of the KE thesis were correct.

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