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**Universities as anchor institutions in cities in a turbulent funding environment:
vulnerable institutions and vulnerable places in England**

Abstract

The paper examines universities as anchor institutions in the context of a major upheaval in the funding of English higher education. The various components of these changes are combined into a multivariate indicator of institutional vulnerability for universities in England. This is then linked to a classification of university cities to identify the most vulnerable institutions in the most vulnerable places with the greatest dependence on higher education. The paper concludes with a discussion of the need for sensitivity to issues of place in any forthcoming restructuring of English higher education arising from the funding changes.

Keywords: Universities; anchor institutions; vulnerable institutions; vulnerable places; English universities; English cities

JEL Codes: H52; I23; R12; C38

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Introduction

In the past few years the concept of local 'anchor institutions' has grown beyond its origin in U.S. urban policy and started to gain a wider currency. The concept lacks a precise or consistent definition but generally refers to large locally-embedded institutions, typically non-governmental public sector, cultural or other civic organisations, that are of significant importance to the economy and wider community life of the cities in which they are based'. The presence of these institutions is understood to generate positive externalities and relationships that can support or 'anchor' wider economic activity within the locality. A recent report from a British research consultancy and think tank summarises the key idea:

anchor institutions do not have a democratic mandate and their primary missions do not involve regeneration or local economic development. Nonetheless their scale, local rootedness and community links are such that they are acknowledged to play a key role in local development and economic growth, representing the 'sticky capital' around which economic growth strategies can be built.
(The Work Foundation, 2010, p.3).

Universities are, often with hospitals and medical centres (see Adams, 2003), perhaps the most commonly cited form of anchor institution. The 'anchor' metaphor fits with the tendency for the main location of universities, in comparison to that of private firms, to be fixed within their current home city (notwithstanding possible expansion to other nearby or far-away campuses) where they have considerable investment in physical buildings and facilities as well as a strong historical identification with the place (exemplified by often being named after the place). On past experience universities may also be assumed to be relatively immune to institutional failure or sudden contractions in size, which means they are potentially a source of stability in local economies and can help buffer against the worst effects of periodic downturns. The fledgling literature on anchor institutions has, however, yet to consider the alternative possibility that universities and similar organisations may be vulnerable to radical public expenditure cuts in response to the kind of fiscal crises currently faced by many national or regional/municipal governments in Europe and North America. A potentially unprecedented reduction of government spending on higher education and replacement with more market-based systems of funding will, according to the anchor institution argument, have a negative knock-on effect on the local economies housing the affected institutions, particularly in places with a higher dependency on the presence of a university.

This paper investigates this scenario in the context of England. Publically funded higher education in England (as distinct from other parts of the UK) underwent a radical shift in 2012 through the introduction of a higher education market place with the introduction of significantly enhanced fees for all home and European Union students and a drastic programme of reduction in direct public expenditure in higher education. For example, in an article entitled 'Beware! Hazards Ahead' the former chair of the association of UK universities (UUK) warns of the consequences of an anticipated 27% real terms reduction in the 'unprotected' part of the budget of the ministry that funds Higher Education for the period 2016/18 (Smith, 2013). This has subsequently been confirmed by the Institute of Fiscal Studies which predicts a 30% reduction of the Department's total budget over the period 2010/11 to 2015/16 (Higher education currently accounts for 39% of the Department's total budget) (Crawford *et al.*, 2013). The full implications of this marketisation and funding reduction have, at the time of preparing this paper, yet to be worked out. But it could leave certain institutions vulnerable, possibly leading to forced mergers and complete closures, or at least very significant staff redundancies and departmental closures, all with significant local impacts. At the same time the reduction and re-ordering of public support for economic development with a new focus on localism is raising expectations that universities might play a greater role as anchor institutions in local economies. It is within this context that this paper

presents a provisional empirical investigation using secondary data of the geography of English higher education. It does not, however, examine the dynamic aspects of 'anchoring' because this is investigated intensively elsewhere (e.g. Goddard and Vallance, 2013). Whereas earlier studies of higher education in England tended to conduct regional analyses and focus on the role of universities in regional innovation systems, the notion of anchoring shifts attention towards the urban scale and the wider role of universities in territorial development in the round. In terms of public policy, cities are an increasingly important focus although questions of definition remain. For this paper we use the spatial framework adopted for a major study of the "State of the English Cities" (Parkinson *et al.*, 2006). For that study the largest English cities were defined as continuously built-up areas, producing a set of 56 Primary Urban Areas that are included in the analyses below, along with other urban areas which house at least one of the set of 116 universities with relevant data available (see the Annex). Although the resulting list of places extends across a wide population size range, they are all referred to as "cities" from here onward for simplicity.

The paper starts from recognition that the geography of changes in the funding of English higher education has hitherto not been examined in any detail. It has six further sections. The next section briefly discusses the local anchoring role of universities, particularly focusing on how this varies with characteristics of the institution and place in question, and the significance of the relationships between multiple higher education institutions in larger cities. The third section gives an overview of the historical development and inherited geography of higher education in England to highlight key intersecting patterns of institutional type and location on which the funding changes are being superimposed. It complements the broader overview of Scott (2013). The fourth section explains the changing higher education funding regime in England. The fifth section outlines the different components of change in the university funding regime and seeks to capture the impact of these changes in a single multivariate indicator of institutional vulnerability. This is then linked in the sixth section to a classification of places according to their dependence on higher education as a source of employment and their economic health measured by the employment rate in order to identify the most vulnerable institutions in the most economically vulnerable places with the highest dependence on higher education. The paper concludes with a discussion of the need for greater sensitivity to issues of place in the on-going restructuring of English higher education.

Universities as anchor institutions

Universities have a number of well-documented forms of positive (as well as negative) economic, cultural and social impact on their home cities, exemplifying their status as anchor institutions. Many larger universities are now major employers in their city and significant purchasers of local goods and services which, magnified by multiplier effects, have considerable direct and indirect impacts on their wider local economy (Felsenstein, 1996; Glasson, 2003; Siegfried *et al.*, 2007). Universities can also draw domestic and international students to live in a city who contribute to the local economy through spending (perhaps most significantly on rented housing) and provide flexible part-time labour (Munro *et al.*, 2009). Others have emphasised their positive effect upon creative economies through attracting and retaining talented students and academic staff (Gertler and Vinodrai, 2005). Research and development links with local firms, the creation of academic spin-off firms, and generation of 'knowledge spillovers' more generally, can also enable strong public research universities to become the nucleus of what Markusen (1996) refers to as 'state-anchored industrial districts' in science or technology based sectors.

The anchoring role of a university should also be seen to extend beyond their economic impacts (Breznitz and Feldman, 2012). The current political climate in the UK and elsewhere increasingly encourages universities to be actively 'engaged' with as well as unavoidably 'embedded' in their home region (Cochrane and Williams, 2013). This requires relationships that successfully balance the interests of the university's academic-related communities such as students and staff with those of various city-based residential and business communities (Russo *et al.*, 2007). The physical development of university campuses can, with good urban planning and partnerships, be one vehicle through which these relationships can be formed (Perry *et al.*, 2009). O'Mara (2012) shows that, in the USA, relationships between city-based research universities and surrounding communities have become of greater mutual importance in the context of urban economic decline. Another clear way that universities can form strong social links with surrounding communities is by providing higher education services for local residents. However, the extent to which this occurs (particularly if those students are from less privileged backgrounds) varies considerably between different types of higher education institution, with more prestigious universities typically able to recruit students from further afield as well as local areas (Gibbons and Vignoles, 2012). In terms of regional engagement more generally, on the basis of a series of European case studies Boucher *et al.* (2003) conclude that "older and traditional universities tend to be less involved in the development of their regions than newer and technical universities" (p.891). As Power and Malmberg (2008) argue, counter to an emerging "policy-led discourse" around local innovation systems, higher education institutions that achieve 'excellence' in research, teaching, and collaboration with external organisations should not necessarily be seen as those that prioritise active relationships with their home region; although these same institutions may still have a significant impact on their place through the kind of indirect economic links identified above and the more symbolic positive association of a city with a renowned university. Indeed, Huggins and Johnston (2009) show that leading research-intensive universities in the UK generate the greatest overall wealth from their high levels of income and employment.

The forms of anchoring role fulfilled by a university do not just vary with the type and size of the institution, but also the context of the place in which it is located (Glasson, 2003). Goldstein and Drucker (2006) show that universities in smaller and medium sized U.S. metropolitan areas have a more marked effect on economic activity in their home region than those in larger metropolitan areas. However, Felsenstein (1996) points out that a smaller proportion of the economic impacts of universities in large metropolitan areas will leak out of these regions, because a higher proportion of students and staff will live there and more of the goods and services needed by the university can be provided locally in the bigger economy. Larger cities are also more likely to have multiple universities or other forms of higher education institution, which means that the local anchoring role of higher education potentially combines the effects of these different institutions. This point is often missed in economic multiplier studies that typically focus on a single university in isolation (Drucker and Goldstein, 2007). If a university in multi-institution city ceases to be present, some of its local impacts could be retained if, for instance, many of its local students simply switched to attend alternative institutions in the same area (Siegfried *et al.*, 2007)ⁱⁱ.

The strength of the local economy in which an institution is based is another important consideration. Research universities located in peripheral regions often assume a more prominent role in the local economic development agenda as a key indigenous innovation presence, particularly if there are relatively few other higher education institutions in the same vicinity (Boucher *et al.*, 2003). Specifically in the UK, Huggins and Johnston (2009)

show that less competitive regions are more dependent on their universities for employment and innovation, but these universities generate less wealth per employee and perform worse in knowledge commercialisation than their counterparts in the more competitive regions of southern England where there is more demand for knowledge inputs and also the capacity to absorb it.

This paper aims to extend this current picture of universities as local anchor institutions by exploring whether the extra factor of vulnerability to changes in the funding regime of higher education will also vary by type of university and geographical context. More specifically we explore the possibility of a relationship between the vulnerability of institutions, the dependence of cities on higher education employment, and a measure of economic urban economic health. The next section outlines the context for this analysis by giving an overview of the historical development of different types of higher education institution in England and their geographical distribution across urban areas.

Historical and geographical development of the English higher education sector

The English higher education sector has developed over the previous 150 years through several phases of new university foundation. In contrast to countries such as Finland and Sweden, where regional policy has in the past prompted the creation of universities in peripheral areas (Andersson *et al.*, 2004; Saarivirta, 2010), the expansion of the UK system has not in general been guided by explicit territorial development concerns. Nevertheless, different phases of new university formation have had relatively distinct geographical manifestations in terms of the size of city in which the institutions were located and, to a lesser extent, their regional distribution. The period from which a university originates in the UK also tends to have a strong correlation with the type of institution it has grown to become in the present day (Anderson, 2006). Here we will briefly outline the main phases of institutional formation that have shaped the inherited geography of higher education in England in terms of this intersection between institutional type and location (also see Tight, 2007). At the end of the section we will summarise the current geography of the English sector and refer to the distinction between older and newer universities which (for reasons outlined below) are commonly referred to in the UK as either pre- or post-1992 universities.

The oldest universities in England were founded in Oxford and Cambridge, and later in Durham, but the majority of the other institutions founded before the mid-twentieth century are located in larger cities. The University of London was set up by the government in 1836 as an administrative body with the authority to award degrees to the two university colleges (forerunners to the current University College London and King's College London) that had been founded in the preceding ten years (Rothblatt, 1988; Anderson, 2006). This developed into the federal University of London that today encompasses 18 colleges and institutes, including comprehensive research universities, but also more specialist smaller institutions in areas such as the arts, medicine, and social sciences. During the second half of the nineteenth century, university colleges were also founded in the major English provincial cities of Manchester, Newcastle, Bristol, Leeds, Sheffield, Birmingham, Liverpool, and Nottingham, although most did not receive charters to become independent universities until the twentieth century (Anderson, 2006). All of them apart from Bristol are in the industrial north or midlands, and most were founded through support from local wealthy benefactors, with a stronger focus on scientific and technical subjects (including medicine) that were of practical relevance to the emerging urban economy and population (Walsh, 2009). The distinctive 'civic' mission of these institutions was, however, largely lost as they moved into the twentieth century and attempted to more closely follow the Oxbridge academic 'ideal' as

part of a national higher education system (see Barnes, 1996). Later civic colleges which became full universities in the mid-twentieth century were mostly founded in smaller provincial cities such as Reading, Leicester and Hull (Tight, 2007). These 'redbrick' universities now collectively form the bulk of England's representation in the Russell group of leading UK research-intensive universities, with domestic student intake, from across the country.

The 1960s was a period of expansion of the sector in terms of both student numbers and institutions, as the UK began a transition to a mass higher education system (Mayhew *et al.*, 2004). Between 1958 and 1961 seven completely new universities were established in England that, in comparison to the civic universities of the late nineteenth and early twentieth century, were located in smaller cities (e.g. Norwich, Lancaster and Canterbury). The availability of a large green-field site for a single residential campus was a key criterion in determining where these new universities would be based (Anderson, 2006, p.137). However, as Jöns and Heffernan (2012) have shown, the precise location was more of an ad-hoc response to lobbying from local actors than a product of central government planning. A direct recommendation of the landmark 'Robbins Report' of 1963 promoted the further widening of access to higher education with eight English Colleges of Advanced Technology promoted to university status. Two were based in London and one in Birmingham, but the rest were in places previously without universities such as Bath, Bradford, and Loughborough. Universities established in this era have typically combined teaching with a healthy research profile.

Further higher education reforms in the wake of The Robbins Report also led to the establishment of a system of 33 polytechnics in England following 1965 (Pratt, 1997). In 1992, the 'binary system' this had introduced was abolished by the government and all the former polytechnics (plus several other higher education colleges) became new universities, mostly with a predominantly teaching focus and a high student intake from local areas. Many of these former polytechnics were in places that already had an old university, including the eight larger cities with 'civic' universities from the nineteenth century. Other former polytechnics, however, became the first universities in cities or towns such as Portsmouth, Stoke and Middlesbrough. New teaching-focused universities continued to be created into the 21st century, mostly through upgrading existing colleges, to meet the ever expanding higher education participation rate which the 1997-2010 New Labour government promoted. This further extended the geographical reach of the university sector to towns such as Bolton and Northampton, as well as turning small cities including Bath, Norwich and Plymouth into multi-university locations.

The legacy of these successive phases of new university formation is that the English higher education system today comprises a number of fairly distinct institutional groupings that reflect the persistent influences of strong institutional 'path dependency' (Krücken, 2003). The widely understood informal hierarchy of institutions crystallizes along the lines of the binary divide nominally abolished in 1992. The older or 'pre-1992' universities in England, including those established or upgraded to university status in the 1950s and 1960s, are recognised as 'research intensive' with considerable physical assets, such as research laboratories that have been accumulated over a long period. Many have medical schools attracting large research grants for biomedical and clinical research and guaranteed student numbers in medical education (which provides some degree of local anchoring). In contrast the 'post-1992' institutions have a less established research tradition and generally more vocationally orientated teaching programmes in subjects meeting local needs like nursing.

These historical processes have also given form to the geography of the higher education sector in England. English cities can therefore be classified according to the number and type of university located there: see Table 1 (nb. see the Notes therein for the definitions

involved here, and also the Annex for further information including the way of dealing with universities with dispersed campuses).

[Table 1 about here]

Table 1 shows that one key feature of the geographical pattern of English university location is that the larger the city, the more universities are likely to be found there. London in fact hosts 40 institutionsⁱⁱⁱ while the next biggest cities Birmingham and Manchester have six and four respectively. This pattern is all the clearer when it is emphasised that – with the exception of just four cities – cities that are classified as “pre-1992/post-1992 only” have only one university each. Thus the vast majority of multi-university cities are among the 56 PUAs which are the largest cities in England. By the same token, the vast majority of these cities can be seen to host universities from both ‘sides’ of the binary divide (Table 1).

The types of institutions spread across individual cities vary significantly. Setting aside the distinct case of London, all the ‘second tier’ cities such as Manchester, Newcastle and Bristol have at least one large research intensive university with a medical school linked to a teaching hospital, and a large former polytechnic. Due to clear differences in history and inherited mission these two types of university have relatively distinct anchoring roles (Goddard and Vallance, 2013). They may also have different levels of vulnerability to the changes in higher education funding described in the next section of this paper. If so then their locational pattern could become important. For example if there were a failing institution in or near a large city with multiple institutions then a merger could be possible without too much disruption. By contrast a merger of universities some distance apart could leave one city with no autonomous institution able to pursue an anchoring role, replacing it with a mere branch campus with little local allegiance.

Table 1 presents one perhaps surprising finding in its broad regional breakdown of cities. The more prosperous south and east of England, which includes London and its hinterland, has a distribution of universities that is very similar to that of the traditionally more industrial and economically disadvantaged north and west of the country. The two broad regions have equal numbers of PUAs and a virtually identical pattern of university presence across them. There are more small cities overall in the south and east, but the patterning across these places of both the pre-1992 and the post-1992 universities is again similar to that across the smaller cities of the north and west. This very strong regional similarity is one reason why this paper has adopted an urban focus to its analysis of variation in vulnerability, with the other key reason being that the potential for anchoring of universities varies not by region but according to the specific urban context in which the institution finds itself.

The changing funding regime

The evolving geography of universities described in the previous section was underpinned by growing public investment in the sector. Although there was no *explicit* territorial dimension to this expansion, the 1997-2010 Labour Government’s commitment to raising the participation in HE to 50% of the 18-21 cohort of young people *implied* increasing the supply of university places in locations previously without a university; these were principally smaller cities in less urbanised parts of the country (e.g. peripherally-located Carlisle and Falmouth). This geographical spreading could be justified on the grounds that potential students from more disadvantaged socio-economic groups where participation in higher education was lowest would not be able to live away from home. This argument applied most acutely to part-time students in employment. These new institutions were allocated publically funded

student numbers and made eligible for other national funding streams for capital investment, to support widening participation and interaction with business and the community; few of these new institutions had a significant research base. The widening participation agenda was also supported by additional funding to regional consortia of universities to work with schools in disadvantaged areas through the Aim Higher Programme^{iv}. Much of this expansion and collaborative endeavour was supported by the new Regional Development Agencies, with those in the less prosperous parts of the country having significantly more funding at their disposal to support the expansion of higher education. They were also able to match their own resources with those from the European Union's regional cohesion fund to support projects that linked universities to the regional economy.

In the period since 2010 higher education has entered uncharted waters in the way teaching is funded, with uncertain consequences for individual universities. An independent review of HE funding commissioned by the Labour Government in the run up to the 2010 election and published shortly after the formation of a new coalition government signalled a fundamental shift away from public funding to universities for teaching, and towards a higher education market-place driven by *full-time* home and EU undergraduates paying fees underwritten by state-backed income-contingent loans (Browne, 2010). The fees of part-time students, who are generally locally recruited, were not expected to be supported in this way, although this changed subsequently.

In seeking to implement these recommendations in a time of overall austerity in the public finances, while meeting political imperatives within the coalition to not to be seen to be favouring more wealthy students and limiting the complexity involved, the Government chose to constrain how the market would operate. Universities were allowed to charge annual fees to home and EU students of up to £9,000 (Thompson and Bekhradnia, 2012), and most opted for this maximum, but in return they had to formulate an access agreement with a Government agency, the Office for Fair Access (OFFA), thereby committing a significant proportion of the fee income to initiatives designed to attract students from disadvantaged backgrounds. To limit the scale of the student loan book, the Government also placed a cap on the number of students each university could recruit. It also provided top-up support for science and engineering teaching where the cost exceeded £9,000, while medical student numbers remained centrally planned and so outside the market. Unfortunately for the newer universities, their concentration on the lower cost arts, humanities, social sciences and business studies courses made them more exposed to the new market.

To reinforce the market the Government has allowed universities able to recruit the best qualified students in terms of grades in the final school examination to do so. (Initially grades AAB for three subjects in the final school examination known as A-Levels and subsequently lowered to grades ABB). With a fixed number of student places this has inevitably been at the expense of those universities that are less attractive. As the Higher Education Funding Council for England (HEFCE) has observed:

The Minister for Universities and Science asked us to consider 'increasing recruitment flexibility further in 2014-2015 for those institutions that show strong recruitment patterns, and to treat those enjoying less demand less favourably. ... As we have not been asked by the Government to increase the number of places to the sector, increasing places to others can only be achieved by reducing the allocation to institutions who recruit significantly below their student number control allocation (HEFCE, 2013a, p.3).

In the Autumn 2013 Budget Statement the Chancellor of the Exchequer announced the abolition of the cap on student numbers in 2015/16 and allowed universities to admit 30,000 extra students in 2014/15 (HM Treasury, 2013)^v. Whether there will continue to be unmet demand for higher education in all types of institution remains to be seen. To date the differential impact of the changes on student demand in *aggregate* has been significant. (We emphasise *in aggregate* because applications data for individual institutions is no longer publically available as it is commercially sensitive in the student market place). Published analysis for the sector as whole by the Universities and Colleges Admission Service (UCAS) through which students apply to universities has revealed that when fees were introduced in 2012 demand from 18 year olds for university places fell but more in those institutions requiring lower grades than those (generally the elite institutions) requiring higher grades (UCAS, 2013). When demand picked up again for the 2013 entry the increase was greatest for those institutions requiring higher grades.

In contrast to the home and EU market universities have been able to recruit freely in the separate market place for non-EU students but some have been more successful than others. However stricter immigration controls has recently heightened uncertainties over this income from the international market place, adding to the unpredictability resulting from the changing national funding regime.

The resultant potential volatility of university funding has been recognised by the Funding Council in its assessment of the financial health of individual institutions where it notes:

there is a wide variation in financial performance and financial health across the sector, and some institutions will face challenges if they experience repeated falls in student recruitment. ... It is important to recognise that past performance does not guarantee future success.

(HEFCE, 2013b).

In the forthcoming public expenditure review, remaining public funding such as direct support to underpin widening participation which is linked to recruitment of students from poor neighbourhoods may not be maintained. While such recruitment is not necessarily local this in practise is the case with university widening participation programmes targeting local schools and recruits unable to afford to live away from home.

In comparison to this volatility, funding for research has remained relatively stable and has been **protected in cash if not real terms** in the national budget. This generally benefits the longer-established and larger universities which received the bulk of funding for research. Moreover the Government has indicated its desire to further concentrate funding for 'excellent' research identified through peer review. This has a clear geographical dimension insofar as just four institutions in London and the Greater South East of England (**Imperial College and University College in London and Oxford and Cambridge**) receive a quarter of all this funding (Hughes *et al.*, 2013, p.9). Whilst these funding streams have been protected, research funding from other sectors will have been more difficult to win in the recession. Thus as Thompson and Bekhradnia point out:

Both high entry qualification recruitment and success in research exhibit the 'Matthew effect', or positive feedback loops: advantage leads to further advantage. High entry qualifications enhance an institution's reputation, which further attracts entrants with high entry qualifications. Success in research leads to increased research funding, which leads to more success in research. The result is a large degree of stability in the ranking of universities by reputation and prestige.

(Thompson and Bekhradnia, 2011, p.30).

These manifold changes are impacting on an already highly differentiated university system. The next section of the paper seeks to map and measure these changes in funding to derive a single index of the *potential* vulnerability of individual institutions using data available for 116 universities (see the Annex Table A). We adopt a multivariate approach because there are many potentially contradictory influences that can impact on institutions in different ways.

Institutional vulnerability

In our discussion of the evolution of the English higher education system from a geographical perspective we saw the emergence of a recognised hierarchy of institutions with the largest and longest established universities as the most advantaged. We hypothesise that larger institutions are the most likely to have the reserves and capacity to adjust to the changing funding environment. As detailed in the Annex, we use the total recurrent grant received from HEFCE to measure size and this places Oxford, University College London, Cambridge, Manchester and Imperial College London at the top of the list (Variable 1). Equally important is the resource per academic member of staff (Variable 2), and this places one of the London specialist institutions, the Royal College of Art at the top of the list because of its high cost subjects. Leading institutions are the most 'research intensive' in that they undertake the most 'globally excellent' basic research rewarded via the Funding Council's peer assessment of research quality. Research at newer universities tends to be more applied and arguably locally relevant, and is not rewarded in the same way. The Government is committed to ring-fencing research funding in cash terms, which will buffer the research intensive universities, at least in the short term. We therefore use the proportion of the HEFCE grant that is for research as our measure of research intensity (Variable 3). Oxford and Cambridge are at the top of this list where they are joined by two specialist London institutions, the School of Hygiene and Tropical Medicine and the London School of Economics.

Turning to teaching, this is the area that is most clearly in the market place. We measure teaching intensity in terms of the proportion of HEFCE funding earmarked for this purpose (Variable 4). This is in part a transitional measure, because fees will in due course replace teaching grants when students under the old regime graduate. However top up grants will continue to be paid for negotiated numbers of students in expensive science and technology subjects where £9,000 fees do not cover the full cost. Not surprisingly a number of newly designated universities which are funded solely for teaching, like University College Birmingham, head the rankings on this measure. Such universities can play a key role in widening the participation in higher education of students from disadvantaged backgrounds, and especially those from their local area. HEFCE recognises the potentially higher cost of teaching students who might be less well equipped for higher education, with a special formulaic fund to support universities teaching students from disadvantaged backgrounds, a

fund that is vulnerable to pressures on the HEFCE budget. We use the proportion of funding for teaching that is to support widening participation as our next Variable (Variable 5). For the elite universities which recruit very few students in this category, this funding stream is insignificant while for others like Teesside University in the North East it accounts for nearly a third of total teaching funding. To indicate the spatial nature of this activity we include as Variable 6 the proportion of students recruited from the (generally deprived) neighbourhoods which HEFCE has defined as having the lowest levels of participation. It is one of the measures used by HFECE to monitor progress in widening participation. Because such students often go to their nearest university, it is also a measure of the local embeddedness of an institution. Universities such as Sunderland and Bolton recruit nearly a quarter of their students from such neighbourhoods, compared with 1.2% in the case of Cambridge.

These recruitment patterns impact on the financial vulnerability of institutions. Students from deprived backgrounds are more liable to drop out of universities which thereby lose income. We measure this in Variable 7 by the proportion of undergraduates remaining at the institutions which they entered, with a high percentage indicating a low drop-out rate. Most of the elite institution who select the best qualified students have completion rates approaching 100% while in some less favoured universities nearly a fifth of their entrants fail to complete. High drop-out rates also occur amongst mature or part-time students and the latter have been particularly affected by the introduction of fees, with numbers of entrants falling dramatically. We measure this aspect of vulnerability by the proportion of the undergraduate intake under the age of 21 (Variable 8).

Our final two indicators of vulnerability in the market place relate to the ability to recruit the additional home and overseas students outwith government control. As noted earlier, institutions are free to recruit any number of students who achieve grades ABB in the school leaving examination. This cap was lowered from AAB between 2012 and 2013 and this generated significant expansion in the most attractive universities. We measure this freedom as the percentage change in student number control limits over the two years (Variable 9). Last but not least is a focus on universities seeking to thrive in the unfettered but highly volatile global market place, for which we measure the proportion of students recruited from overseas (Variable 10). This clearly demonstrates a London effect with all the highest ranking institutions being located in the capital, where the London School of Economics recruits two thirds of its students from overseas. By contrast the University of Cumbria in the rural north west has only 2.5% of its students from outside the country. **The ability to recruit international students will be a key factor in determining the future financial health of institutions. The impact of these students on local economies is an issue requiring further research and is beyond the scope of this paper.**

To complete our analysis of *potential* vulnerability we include three measures of change, recognising the need to capture how revised funding schemes may be impacting on individual institutions. These are the change in research and teaching funding from 2012/13 to 2013/14 (Variables 11 and 12), and in recognition of the finite 'pot' of funding from central government, change in share of total teaching funding (Variable 13). Finally we include a composite index of *current* institutional financial security that is calculated by university directors of finance. (Universities UK, 2012). This index reflects the scale of an institution's reserves that might enable it to cope in an increasingly volatile market place, as well as the degree of its indebtedness linked to past investment, and its ability to invest now in new facilities to remain competitive in the future. It was not clear whether this index would be strongly correlated with those we have used to measure the potential *future* vulnerability of institutions.

The 14 variables for 116 institutions were subjected to a principal components analysis, because this served both to remove redundancy in the dataset – resulting from some variables which, despite being conceptually distinct, rank the 116 universities very similarly – and to pull out underlying patterns that are reflected in the values of several variables. Four components were extracted which together accounted for approaching 70% of the total variance in the dataset (Table 2). The first component accounted for 41% of the variance and convincingly captures different facets of vulnerability, both positive and negative. As was hypothesised above, vulnerability is strongly negatively related to such factors as institution size, research intensity, growth in share of national teaching funding and proportion of overseas students. Also as was hypothesised, vulnerability is positively related to drop-out rate, funding for widening participation, and higher proportions of the overall block grant being for teaching generally. Indeed for every one of the variables with a hypothesised link to vulnerability, the sign (the positive/negative loading) on component 1 conforms to the hypothesis outlined above (Table 2). As a result, this component is reasonably interpreted here as an index of vulnerability.

[Table 2 about here]

It is important to recognise the inevitable limitations of a single index. A first possible concern is that the sector's own measure of short-term comparative financial security of institutions proves to be almost completely unrelated to this index of vulnerability, with a loading of only 0.08 (Table 2). The explanation seems to be that the sector's measure is essentially reflecting performance under the old funding regime, whereas the index calculated here focuses on indicators of potential vulnerability to the funding changes now underway. Another potential concern could be that the analysis found three other principal components which might each draw attention to a rather different but important aspects of university robustness to the current changes to their funding environment. Table 2 in fact shows that the variables loading strongly on the second component were also contributing substantially to component 1 scores and so their influence is largely captured here by the use of those scores as a single index of vulnerability. The third component highlights the different pattern to the values of the sector's own measure of financial security (as noted above), while the fourth component mainly highlights the fact that the values on variable 11 are unrelated to those of the other variables. Thus it seems reasonable to interpret the component 1 values as at the very least a first approximation to an index of university vulnerability.

The index finds that the elite universities are less vulnerable, with the 20 least vulnerable institutions featuring the English research-intensive universities in the elite Russell Group^{vi}. Bearing in mind that the index aims to measure vulnerability to key on-going funding regime changes, this suggests that marketisation tends to benefit those institutions that are already strong. At the other end of the scale, the most vulnerable institutions are either small institutions very recently accorded university status or former polytechnics made universities in 1992. Table 3 dramatises this contrast between the vulnerability scores of pre-1992 universities and those of institutions on the other side of the binary divide. In fact all but one of the 29 universities in the quartile of the most vulnerable institutions are post-1992 universities (the single exception is one of the 9 universities not allocable to either side of the binary divide). The pattern is equally stark at the other end of the spectrum of vulnerability, with not one post-1992 university among the quartile with the lowest vulnerability scores, despite these newer institutions comprising well over half the 116 universities analysed here.

Overall the results can be summarised by combining pairs of quartiles to simply look at the membership of the upper and lower halves of the distribution of vulnerability index values. Table 3 then reveals that over 80% of all the post-1992 institutions have vulnerability scores which place them among the more vulnerable half of all universities, whereas just two (5%) of the pre-1992 universities give similar cause for concern about their prospects under the newly emerging funding regime.

[Table 3 about here]

Vulnerable institutions and vulnerable places

The final empirical question we now address relates to the distribution of the most vulnerable institutions across more or less vulnerable cities. Having just obtained very clear results from a simple division of universities into two groups (those with higher and those with lower vulnerability scores), the following analyses offer a similarly simple approach to the classification of university cities. The first step is to classify the 57 cities that house the 116 universities by their level of work deprivation, with the key indicator here being the employment rate (i.e. the proportion of all aged^{vii} 16-74 in 2001 who were in full-time equivalent employment). The employment rate rather than unemployment rate was used partly because of the unreliability of the latter measure – especially due to changes to the UK benefits system – but also because employment rate is a leading Europe 2020 indicator. Among the university cities the mid-point for the employment rate variable is 54% and so all cities falling below this level are classified as ‘work poor’ (nb. the cities thus identified are predominantly in the poorer north and west parts of England, as would have been expected). Of the 116 universities, 61 are located in work poor cities while 55 are in cities with higher employment rates.

The second step in identifying the cities which are more vulnerable to turbulence in the university sector is to take account of the level of dependence of a city on the university sector as a source of jobs. Thus a key second measure here is the proportion of all full-time equivalent jobs found in the city that are in the higher education sector. **On this indicator the mid-way split of the cities with universities yields a cut-off point of 2.87% and there are 75 universities located in cities where a higher proportion of all local jobs are in the sector. Table 4 shows that 57 of these cities that are relatively more dependent on higher education for work are also work poor cities.** Indeed the two measures set out here prove to be linked in a way that was far from inevitable: over three quarters of all cities which are more dependent on higher education for jobs are generally work poor, whereas less than one in ten (4 out of a total of 41) cities with low dependence on the sector for jobs is work poor in general terms. Put the other way around: all but four of the work poor cities show above average dependence on higher education to provide local jobs (Table 4).

[Table 4 about here]

The remaining step here is to set the index of potential vulnerability of individual universities in the context of the above four-way classification of their cities. Table 5 shows the results. This reassuringly reveals that 29 of the least vulnerable institutions in the bottom half of the ranking according to our vulnerability index should be able to continue to play an anchoring role in work poor places more dependent on higher education. Taken as a whole the table suggests that in aggregate university vulnerability does *not* seem to be either more or less likely to be found in vulnerable cities. Nevertheless the fact remains that 17 of the most

vulnerable institutions in the top quartile of scores on the index can be found in work poor places more dependent on higher education – the top left hand corner of table 5 – with all of the possible negative consequences in terms of the loss of an anchor institution. These cases are discussed below in terms of type of institution and geography.

[Table 5 about here]

Given the previous evidence we have provided, it will be no surprise that all the 17 universities identified by the above analysis are on the post-1992 side of the binary divide. The criteria that identified the 17 excluded any university in a relatively work rich city, resulting in none of them being located close to London where employment rates are higher. Even so seven of the 17 are in the south and east of England, once again suggesting that location by broad regional scale is not a strong influence on the issues of interest here. Similarly the fact that four of these 17 vulnerable universities in vulnerable cities are located in cities that are too small to be PUAs is also not a very notable result, because this is similar to the proportion of all universities to be found in smaller cities. A final way in which these 17 universities are not very geographically distinctive is that 12 are located in multi-university cities and this is a very similar proportion to that of all 116 universities that are in such cities.

The main conclusion which follows from these findings is that university vulnerability is a risk that does not result from its location but is due to its particular characteristics, and most especially to which side of the binary divide it belongs. Such vulnerable universities are located in cities of which the proportion that are themselves vulnerable is similar to that of all university cities. Equally to be expected, it is mostly multi-university cities which house the 17 vulnerable universities in vulnerable cities. Yet these superficially ‘null’ findings are not without policy implications. They demonstrate that to introduce a geographical awareness into higher education policy will require a more nuanced approach than a simple north/south differentiation or a targeting of support to universities in poorer cities. Policy implementation instead may need to reflect the distinctiveness of particular cities and the institutions they house. This may mean one approach for vulnerable cities which not only have robust long established universities but also one or more vulnerable institution, whilst another very different approach is needed to a vulnerable university that is the only university in its city. In developing such a context-sensitive policy to vulnerable universities, one key concern could be fostering the anchoring role of each university in its city’s economy and society.

Discussion

What kind of policy intervention would be needed to foster the anchoring of institutions in cities in a way that takes account of their potential vulnerability and their institutional and geographical distinctiveness? We noted in the opening of this paper that the geography of the funding of the English higher education system has hitherto not been examined in any detail. This may be because what higher education is provided where is not an explicit duty of those responsible for the health of the sector, a position that sits comfortably with principles of institutional autonomy. And as also noted in the definition of anchor institutions that we quote, the primary objective of universities does not involve regeneration or local economic development. While the Government did commission an independent review of ‘Universities in their Local Communities: Enabling Economic Growth’, the terms of reference of the review made no explicit reference to the geographical dimension in terms of the needs of the local economy or the capacity of different types of higher education institution to

contribute to local economic development (BIS, 2013a). Moreover, the title of the final report of the review was changed to 'Encouraging a British Invention Revolution'. It explicitly eschews a territorial perspective stating that funding for university links with business should be structured "by technology/industry opportunity, not by postcode. ... [And] should embrace the country's density of population and institutions". By implication this will favour the greater South East of England where the supply of HE research and private sector demand is concentrated. There are certainly no specific incentives within this review for universities to play an anchoring role in their local economies (Goddard, 2013)

What might this territorial blindness of national higher education and national innovation policy mean under the new funding regime that we have described? Our research suggests that the higher education market place is likely to further emphasise the hierarchy of institutions. But if this happens should the state intervene to support as many providers as possible, however small and vulnerable, maximising local provision across the country. Or should it let the best get bigger regardless of the consequences for weaker institutions and places?

In the event of impending institutional failure, with all of the negative consequences in terms of students on courses as well as local impacts, what could or should HEFCE do? Mergers are one possibility. In the past HEFCE have supported institutions wishing to merge and has produced guidance on best practice (HEFCE, 2012). Indeed as Ramsden (2012) has pointed out, 40 institutional mergers took place in the sixteen years up to 2009/10. Significantly the majority of these were in London and the South East where the density of institutions is high; this does not augur well for those parts of the country with a low density of institutions and therefore less opportunity for joining up neighbouring universities. In its guidance on institutional collaborations, alliances and mergers, HEFCE notes:

Institutions are being challenged as never before to reconsider their fundamental role, market position, structures, relationships, partnerships, policies and processes. They will need to continue questioning how they operate internally, engage externally with other institutions and organisations, and interact with the wider society. This raises the profile and potential relevance of collaborations, alliances and mergers [CAM] as part of institutions' response to the drivers for change. ... A clear case based on the core purposes of HEIs – teaching, research and knowledge exchange – should be at the heart of all CAM projects. This implies a strong focus on students, the academic community and the wider society. Publicly funded institutions should consider the 'public good' as well as business needs.

(HEFCE, 2012, pp.4-5).

HEFCE clearly regards mergers as a voluntary matter for individual autonomous institutions. It does not have the powers nor is it likely going forward to have the resources to ensure the collective public good in terms of the anchoring role of institutions in different places. It is not a planning body and can only be operate at the margins of the challenge ahead. For example, through its recently announced Catalyst Fund it has invited institutions to bid for resources for 'managing transition' to:

address vulnerabilities and bring about change necessary to protect and sustain activities in the public and student interest; ... and [related to] other strategically

important provision ... that is distinctive in terms of accessibility (place, type and mode) ... [and of] national or local importance.

(HEFCE, 2013c, pp.1-2).

The fund will however “work with the grain of established success, rather than duplicating capacity or mitigating the impacts of selective allocations” (HEFCE, 2013c, pp.3-4). However linking our finding that some of the potentially most vulnerable institutions can be found amongst those more recently established and the suggestion in the literature that such institutions are more likely to be strongly anchored in places, suggests that a more proactive stance may be required. A case could therefore be made for the protection of certain institutions in particular places on the grounds of their role as vehicles for local economic, social and cultural development, a role that is more important given the reduced capacity of other public institutions, particularly local authorities, to perform such functions. There may also be a case for selective support for older and less vulnerable institutions particularly in the larger cities that have been re-discovering their civic role but may now be considering retrenchment given the uncertain contribution of such activities to the ‘bottom-line’ and their position in the global HE market place (c.f. Goddard,2009). A reference in the budget allocated to HEFCE for the forthcoming year suggests that the Government is aware of the dangers of disengagement by suggesting that “we want HEFCE to further support universities engagement with Local Enterprise Partnerships and Local Authorities particularly taking account the smart specialisation priorities [of the European regional funds] where the universities can make a distinctive contribution” (BIS, 2014).

Such interventions might at the margin mitigate some of the most unwanted impacts of the introduction of a higher education market. But to what extent is the English case unique? Following the UK experiment, many countries with publically funded higher education systems and pressure in the public finances have been exploring the possibility of getting students to bear more of the costs of their education but with no general recognition of the possible regional implications of the introduction of a higher education market place. Significantly Germany which has experimented with fees (low by English standards) has now abandoned them. Hotson (2014) suggests that geographical considerations around the desire within the individual *Länder* responsible for funding higher education to maintain a long established decentralised and non-hierarchical system lies behind this decision. The contrast with England could not be starker where competitive forces in a highly centralised state have reinforced the position of a few world class universities concentrated in the South East corner of the country. As we have indicated in our review further marketisation is likely to reinforce this hierarchy at the expense of building a world class higher education system catering for a diversity of objectives, including access, social mobility, and capacity and commitment to act as anchor institutions in different cities (Hazelkorn, 2011). If there is a political will to build such a system on the present structure it will need a high degree of sensitivity to the strengths and weaknesses of individual institutions and their specific locational context.

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Table 1: English cities by broad region, size and number of universities

		cities by number and type of university			
		both pre- & post-1992	pre-1992 only	post-1992 only	none
England		18	11	27	430
south & east	PUAs	8	2	7	11
	smaller cities	2	4	9	263
north & west	PUAs	8	2	6	12
	smaller cities	0	3	5	144
<p>Notes</p> <p>"city" here means any official urban area (>10,000 residents in 2001); PUAs were defined (as cities with over 165,000 residents) for the research on the State of the English Cities (Parkinson <i>et al.</i> 2006), which also identified the regional groupings used here.</p> <p>"university" here means one of the 116 institutions covered by the available data as defined in the Annex; 9 of the 116 are not readily allocated to the pre-/post-1992 typology due of their special status</p>					

Table 2: Loadings on the 4 Principal Components

(loadings shown in bold are strong (viz. above .333 or below -.333))		Component			
		1	2	3	4
v1	£ total recurrent grant	-0.719	0.211	-0.006	0.162
v2	£ total grant / FTE academic staff	-0.315	-0.684	0.325	-0.084
v3	% recurrent grant that from research funding	-0.857	0.413	0.058	0.154
v4	% recurrent grant that from teaching funding	0.840	-0.443	-0.087	-0.164
v5	% total teaching funding that student opportunity funding	0.907	0.135	-0.186	0.001
v6	% students that from low participation neighbourhoods	0.738	-0.009	-0.241	0.080
v7	% students continuing to the second year at same university	-0.658	-0.117	-0.229	-0.314
v8	% students aged under 21 on admission	-0.643	-0.006	-0.228	-0.274
v9	% change in student control limits	-0.337	0.058	-0.474	-0.361
v10	% students that non UK	-0.694	0.222	-0.083	0.180
v11	% change total research funding	-0.050	0.215	0.150	-0.808
v12	% change total teaching funding	-0.637	-0.629	-0.085	0.083
v13	% point change in share of national total teaching funding	-0.685	-0.376	-0.103	0.116
v14	UUK Security Index	0.080	-0.096	-0.817	0.154
% of total variance accounted for		41.05	11.12	8.95	8.03

Table 3: Index of vulnerability scores by quartile, for universities of different types

row %s may not sum to 100 due to rounding	vulnerability index (quartiles)				all
	1=most	2	3	4	
pre-1992	0 (0%)	2 (5%)	15 (38%)	23 (58%)	40
post-1992	28 (42%)	26 (39%)	13 (19%)	0 (0%)	67
Specialist	1 (11%)	1 (11%)	1 (11%)	6 (67%)	9
all	29	29	29	29	116

Table 4: Distribution of universities across cities classified by employment rate and dependency

number of universities (sample city)	more dependent on higher education jobs	less dependent on higher education jobs
work poor	57 (<i>Liverpool</i>)	4 (<i>Stoke-on-Trent</i>)
work rich	18 (<i>Bristol</i>)	37 (<i>London</i>)

Table 5: University vulnerability within cities classified by employment rate and dependency

number of universities		vulnerability index (quartiles)				All
		1=most	2	3	4	
more dependent on higher education	work poor	17	11	12	17	57
	work rich	4	4	8	2	18
less dependent on higher education	work poor	4	0	0	0	4
	work rich	4	14	9	10	37
all		29	29	29	29	116

ⁱ The different but in some respects similar concept of large private firms as the ‘anchor tenants’ within industrial districts (see Agrawal and Cockburn, 2003) is not covered in this paper.

ⁱⁱ As discussed later in this paper, the distinction between places with single and multiple institutions is also relevant to the possibility of financially struggling institutions merging with stronger institutions in the same place which is discussed in the analysis below.

ⁱⁱⁱ London houses fully 7 of the 9 specialised cases that do not fit into the pre-/post-1992 typology here.

^{iv} See <http://www.heacademy.ac.uk/aimhigher> [Accessed 24th February 2014].

^v The extra student loans will be financed by selling the ‘old’ student loan book of £890m (covering the period 1990-1998) to a debt management consortium for £160m. This leaves unresolved to the next Parliament the question of funding the ongoing loans.

^{vi} See <http://www.russellgroup.ac.uk> [Accessed 24th February 2014].

^{vii} This is the standard Population Census definition of the potential working age group.