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Urban knowledge exchange: devilish dichotomies and active intermediation

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Abstract: Knowledge exchange and innovation have a strong local dimension and require face-to-face relationships and collaborations between universities, industries and governments. Cities are turning to the knowledge base to enhance their own socio-economic development in the face of global competition and continuing gaps in prosperity. This paper examines the contexts, challenges and consequences of these shifts. First, the paper considers theoretical and policy rationales which create the conditions for the emergence of knowledge-based urban development (KBUD). Second, it highlights three dichotomies that produce tensions in the practice of knowledge exchange at an urban level. Finally, the paper considers the capacities and capabilities of different urban areas to respond to contemporary challenges through processes of active intermediation. In conclusion, this paper provides an agenda-setting provocation for the co-production of sustainable knowledge-based urban futures between academia, policy and practice.

Keywords: knowledge-based urban development; KBUD; urban knowledge exchange; science, technology and innovation policy; intermediaries; cities; universities.

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Tim May is the Co-Director of SURF. His empirical work and advisory roles have been conducted in a number of organisations in the public and private sectors. He has held research grants from a large number of sources and works for universities advising them on intellectual, organisational and strategic developments. He has written and edited 12 books that have been translated into 14 languages. With colleagues in SURF, he is continuing work on universities in the knowledge economy; innovation and socio-economic development; frameworks for holistic views of city-regional development and the role of 'active intermediaries' in effective knowledge exchange.

1 Introduction

The dynamics of the knowledge-based era have combined with those of a multi-scalar international political economy to produce the 'glocalisation' of science (Swyndegouw, 1992). Public policies at supra-national and sub-national scales have been repopulated through a new jargon of clusters, knowledge spill-overs, innovation and knowledge transfer, as science and technology are seen to be revolutionising approaches to urban and regional development. The emphasis is on reorienting economies to build science regions and enhance urban growth through alliances between universities, industries and policy-makers. Within this context universities are increasingly required to operate at a number of spatial scales, interweaving international, national and sub-national roles (Benneworth and Hospers, 2007).

The relationship between science and the economy is central to policy frameworks for growth and competitiveness at European, national and regional levels. Since the 1980s, processes of top-down regionalisation and devolution across Europe have been accompanied by bottom-up mobilisation (Borras-Alomar et al., 1994; Brenner, 1998). What is new is the attention being directed towards the public sector research base in 'supply-oriented' approaches and the emerging relationships between universities and their regions. Such is the transdisciplinary relevance of changes related to the role, value and economics of knowledge, that most accounts of transformation are incomplete if read in isolation. A number of studies examine the spatial dimensions to building innovation ecosystems (Cooke et al., 2004), the roles of universities in knowledge-based urban development (KBUD) (Charles, 2006), the development of sub-national 'science' as opposed to 'innovation' policies (Cooke, 2004), the development of 'creative cities' (Chapain et al., 2009) and new strategies for urban growth (Oatley, 1998). These interventions come from science and technology studies (STS), political science, economics, geography and regional and urban studies.

Efforts have gone into improving understandings of knowledge exchange rather than linear notions of transfer, along with the need for cross-sectoral partnerships (Abreu et al., 2008). There is an increasing consensus in academic and policy terms around the non-linearity, complexity and spatiality of innovation and knowledge exchange (Cope et al., 2009; Uyarra, 2009). Some of these studies provide critical insights into new modes of working between universities and industry and enhance our understanding of what works in bilateral knowledge exchange (Cosh and Hughes, 2009). Increasing recognition of the importance of place in building innovation ecosystems is central to contemporary understandings from both a science-based and urban perspective (Carillo, 2006; Simmie et al., 2008).

On one hand, science, innovation and higher education policies are becoming more sensitive to the role of regions and to lesser extent cities, in meeting key objectives relating to building knowledge economies and societies. A wide range of governmental policies across European and international contexts are based on multi-scalar interventions in which sub-national actors assume both 'active' and 'passive' roles (Perry and May, 2007). On the other hand, cities are increasingly viewed as key drivers of regional and national growth in the context of a knowledge-based economy (Parkinson, 2006). Science, knowledge and innovation are not only concerns for world cities or traditional centres of scientific excellence, but also for ordinary, industrial and peripheral regions as they seek to transform socio-economic and environmental futures (Ache, 2000; Hodson, 2008).

In this context, urban knowledge exchange plays a key function in the contemporary multi-scalar knowledge-based society in ensuring that relevant knowledges are harnessed to improve the conception, execution and outcomes of policy at the urban level. It is not only economic growth, but social inclusion, cultural vibrancy, sustainability and political empowerment that are at stake. Innovation and knowledge exchange are all more urgent in the context of the current financial crisis, as multiple governments proclaim that science, creativity and new ways of thinking are required to lead out of recession (Brown, 2009). Add to this is the need for cities to play a central role in addressing the challenges of climate change and reduced resource constraint, through building multi-sectoral, interdisciplinary partnerships (Hodson and Marvin, forthcoming) and there is a pressing need to take knowledge exchange at the urban level seriously (Roberts et al., 2009).

This paper seeks to examine the critical issues that inform urban knowledge exchange in the contemporary climate. The paper reviews the rationales for urban knowledge exchange across theory and practice; the critical challenges that cities face in building knowledge-based futures and the issues associated with the capacities and capabilities of different places to respond. A central contribution of the paper is to outline three dichotomies that produce tensions for urban places, as well as to suggest how active intermediation may provide a productive way forward. In doing so, it seeks to provide a basis for further critical reflection on the spaces of engagement for KBUD.

For this purpose, this paper draws upon recent research carried out in European regions and cities, with academics, policy-makers and businesses within supranational, national and sub-national organisations (see www.surf.salford.ac.uk). Work has been funded by the UK's Economic and Social Research Council under the Science in Society Programme (2003–2007) as well as organisations such as the Swedish Environmental Research Agency (MISTRA), Organization for Economic Cooperation and Development (OECD), UK Science Cities, British Chambers of Commerce and a range of local governance organisations in English city-regions. Case study work has been carried out in England, France, Germany and Spain, each of which has included semi-structured interviewing (over 250 since 2003), documentary analysis of primary and secondary materials and ethnographic methods, including participant observation and focus group activity. These methods have helped examine the relationship between written policy statements, collective and individual positions and dispositions and between expectations and capacities to deliver in relation to discourses around excellence/relevance, institutions/knowledge and economy/society.

2 Contexts for KBUD

KBUD is a term that encompasses a wide range of perspectives on the relationship between knowledge, space and place in the context of emerging global discourses around the knowledge economy and the relative importance of different factors for production. At its broadest level, KBUD embodies the idea that the realisation of the knowledge economy has a place-based, urban dimension. This gives rise to various permutations: knowledge-based development that has urban dimensions; urban development that may be knowledge-based; or strategies in which knowledge is alternatively seen as a symbol, product or process whose acquisition, harnessing or embedding has potential benefits at the city scale. The term is often used, yet is rarely defined and can refer, for instance, to

the roles of information and communication technology (ICT) and knowledge infrastructures in the development of cities; the ways in which new forms of knowledge, from multiple stakeholders, are incorporated into decision-making about urban places; or the role of creative industries and knowledge-intensive services within the urban realm (see for instance, Carillo, 2006; Yigitcanlar et al., 2008a; COST, 2009). It is particularly important to pay attention to the roles of universities in knowledge-based development, as institutions which have traditionally been central to scientific knowledge production and are increasingly involved in urban growth coalitions.

The plethora of competing interpretations of KBUD can in part be attributed to an apparent de-differentiation between fields of activity and the increasing porosity of boundaries between science, knowledge, culture, society, geography and economy (Lyotard, 1984; Gieryn, 1999). This has given rise to a range of inter- and multi-disciplinary writings from a number of perspectives. Theories of agglomeration, industrial districts, locational specific advantage, as well as increasing emphasis on innovative milieux, learning regions and economic advantage through systemic interactions have led to a shift from an emphasis on national to regional systems of innovation (see Uyarra, 2009). New modes of knowledge production (Gibbons et al., 1994) have strong local and regional dimensions. Drivers from within science and research include not only the changing nature of research problems/objects, such as in relation to biotechnology, synthetic biology etc. (Cooke, 2005), but also strengthened collaborations and forms of working and the need to demonstrate relevance. Others emphasise the relationship between science, knowledge and the cultural buzz of cities/regions, through considering the social, cultural and institutional conditions of growth necessary for economic development at local and regional levels (Archibugi and Lundvall, 2001). Human capital forms an important element as well as the relationship between science, creativity, skills and economic development (Florida, 2002). Such shifts are set against a backdrop of devolution and decentralisation to regional actors over the past 30 years across Europe which has led to greater formal competencies at the sub-national level, combined with new forms of network or associational governance and new public management (Ohmae, 1995; Bache and Flinders, 2004; Brenner, 2004; Crespy et al., 2007; Lyall, 2007).

Within these writings it is possible to identify four different dimensions as outlined in Table 1. A range of economic, scientific and socio-cultural factors in relation to the role of science in society are interacting with dynamic changes in political governance. Rationales for sub-national knowledge-based development may be economic, scientific, socio-cultural and political; they may be drawn from theoretical frameworks, or else have developed in policy and practice borne of experience or justified by necessity (Laranja et al., 2008). The use of the term 'dimension' is deliberate: in practice, rationales for KBUD are multiple and overlapping. Economic, scientific, socio-cultural and political dimensions are not exclusive, yet may be in tension or even contradictory in terms of their spatial implications. Linkages between science, technology and innovation (STI) and regional development policies render this apparent. Here strong differences in what 'regionalisation' means in practice is seen, as mediated through national economic and scientific systems (Fristch and Stephan, 2005). A common rationale behind the use of new instruments, such as clusters, technological districts and innovation poles, relates to the economic potential of science and technology. In many countries, an additional rationale shared between national and regional actors is a concern for balanced growth and the potential of STI to address regional disparities. In France, Germany and Italy,

examples can be seen of national policies with strong sub-national dimensions (Crespy et al., 2007; Koschatzky and Kroll, 2007). These include initiatives to target specific regions and cities to build capacity, such in East Germany or Southern Italy, as well as open competitions to build excellence, in which all regions can participate, but only some will benefit. These examples contrast strongly with the situation in the UK where regional economic development arguments are not accepted at national level as legitimate rationales for influencing the contours of national policy, requiring sub-national actors themselves (the devolved administrations, English regions and science cities) to link STI and socio-economic development goals (Charles and Benneworth, 2001; Perry, 2007).

Table 1 Dimensions of policy rationales for KBUD in theory and practice

	<i>Theory</i>	<i>Prevalence in practice</i>
Economic	<i>Regions need knowledge/science</i>	Economic rationales for regional involvement in STI predominate. These discourses populate strategic documents at national, regional and city-regional levels. Some policies are emerging that have a more systemic intent, but many instruments are still used in isolation and without a clear understanding of their coordinated impact.
Scientific	<i>Knowledge production needs regions</i>	Scientific rationales are less frequently articulated for sub-national interventions in the knowledge base. However, the objective of meeting the Lisbon targets and forging the European research area has led to a shift in instruments towards those that favour building scientific clusters and centres of excellence that have both global (distributed) and localised (embedded) dimensions. The need for increased scale and scope of scientific activities and infrastructures is most commonly articulated.
Socio-cultural	<i>Knowledge has socio-cultural value</i>	The socio-cultural rationales for sub-national interventions in STI policy tend to be of second order importance for policy-makers at multiple scales. Instruments that favour more immediate and tangible economic outputs are more common than those aimed more loosely at the socio-cultural milieu for innovation, skills, learning, creativity or public engagement activities.
Political	<i>Knowledge/science brings status</i>	Political rationales for sub-national involvement in STI are more often implicit than articulated, depending on country-specific contexts. Regions may articulate economic rationales for STI interventions, yet be motivated implicitly by the need to redress regional imbalances or achieve international/European status.

‘Cities’ and ‘knowledge’ have become targets for different levels of government, but also for different government departments and governance agencies. Critical strategic documents are signed jointly by those charged with science, research and higher education policy, economics, finance, trade and with balanced growth and regional development. Agencies responsible for health, sustainability and climate change are all part of the mix as targets are shared, cascaded down or, in some cases, imposed on urban partnerships. Transport has a critical role as mobility, in all its guises, is a central concern in providing the critical infrastructures for knowledge-based growth.

Institutional, governmental and departmental positions and attitudes vary. As our interviews with representatives in the European Commission in DG Research, Innovation, Enterprise and Regions revealed, acting as joint signatories on warmly worded policy documents masks a range of different perspectives regarding the relationship between knowledge, scale and place. In practice, across a range of national and regional contexts, there is little cross-departmental discussion on knowledge-based growth, despite the seemingly endless reorganisations and renaming of ministries for science, economics, business and higher education that have characterised government restructuring (Dresner, 2001).

The shift to a multi-scalar and multi-actor knowledge economy reflects changes both vertically in the division of responsibilities between territorial levels, as well as horizontally between actors implied in the governance of science policy (Kooiman, 1990; Stoker, 1998; Hooghe and Marks, 2003). This 'multi-level governance' system serves to both diversify and heighten the range of expectations upon sub-national actors, creating mixed messages in the international political economy of knowledge (May and Perry, forthcoming). Cities must act, they are told and they believe, supported by theoretical insights and practical evidence. However, there is a deafening silence about *how* diverse expectations are to be managed in practice, thereby leaving sub-national authorities with a series of dichotomies that raise questions over the aims, nature and effectiveness of contemporary knowledge-based interventions.

3 Devilish dichotomies for urban knowledge exchange

3.1 Global excellence and local relevance

The first of our devilish dichotomies concerns the relationship between excellence and relevance. Increasingly, policy discourses have sought to bring these together through emphasising the need for excellent basic, curiosity-driven research and application-oriented research, as well as the need for stronger relationships between science and innovation and research producers and users. Subtle differences can be seen in how different national politico-economic, research institutions and knowledge capitalisms mediate the excellence-relevance debate. Policy texts in Germany emphasise industrial competitiveness and growth as the driving concern, with excellence in basic research as a key mechanism to achieve this. In France, however, policies have tended to focus on the need to commercialise and exploit scientific research for competitive advantage to maximise investments made, for other reasons, in science and research. At a European level, the distinction between pure and applied work has been replaced by an understanding of 'frontier science': that is, basic research linked to application via a driving concern to reinforce excellence in scientific and technological competition (European Commission, 2005).

Despite evidence of heterogeneity in how knowledge-based discourses touchdown in different contexts, an overriding concern with justifying investments in science and research according to narrowly constituted economic criteria can be seen in policy statements, along with assumptions about how such investments should be assessed. To this extent, relevance would seem an equal partner in defining what knowledge should be produced, how and with what intended outcomes. Indeed, most often, it is aimed to have our cake and eat it, produce and consume knowledge as a commodity in equal measure.

A harmonious accommodation between excellence and relevance breaks down once issues of context and scale are introduced. The critical question is how changing multi-scalar contexts relate to science, through an emphasis on critical mass, clustering, scientific spill-overs and synergies on the one hand, and more distributed, disembedded ‘networks of excellence’ and global circuits of knowledge and power on the other. Not only universities, but also cities and regions, increasingly operate within diverse scales of action as well as specific spatial contexts. Many different actors seek to feature in league tables and rankings of world cities, world universities or knowledge-intensive places, creating dynamic tensions between the global and the local.

What we then see is a simplistic mapping of the excellence/relevance debate onto global/local dimensions (Perry and May, 2006). Disembedded understandings of excellence and relevance predominate, with local and regional interventions often equated with second-rate science. It is particularly evident in relation to dichotomous characterisations of universities in an increasingly competitive international higher education landscape, with a distinction between world-class research-intensive universities and local employer-engaged institutions. Universities, cities and their partners are urged to be excellent and relevant, global and local. What then emerge are sets of policies that sit alongside each other yet embody different spatial assumptions and might, in a single context, act to contradict each other. The challenge for cities and regions is to seek not excellence *and* relevance as two separate endeavours, but a new *modus operandi* of ‘excellent-relevance’ and ‘relevant-excellence’ in which the effective production and application of knowledge are brought together for the benefit of different places (see Table 2).

Table 2 Excellence, relevance and context

Disembedded excellence can be seen as traditionally non-spatial and amenable to global logics in which processes of knowledge production are divorced from the context in which they are produced. Distributive issues are secondary to quality as judged by peer-review.

The corollary to this is *competitive relevance*. A de-contextualised interpretation of relevance places emphasis upon application to specific economic or social issues and strategic priorities as a precondition for global success. The focus on biotechnology, nano-technology and genomics is symptomatic: research may be ‘applied’ but does not have a direct advantage to any particular community or group.

A *relevant excellence* discourse highlights the indirect benefits of science and technology to particular places and spaces. This does not relate to changes in processes of knowledge production, rather it seeks to exploit, extract and attract knowledge products and institutions for territorial benefit.

The partner to this discourse can be characterised as *excellent relevance*. Here, we see a concern with what is produced in scientific establishments in terms of the generation of co-produced research priorities and agendas through a linking of content with context.

A final discourse then appears as *contextual relevance* where scientific investments are seen to be driven by narrow political or economic regional objectives, giving rise to a fear on the part of the scientific establishment of an inward-looking parochialism and ‘second-rate’ science due to political interference.

3.2 *Places of expectation and spaces for reflection*

Linked to the above, there is an active debate on the implications for universities of knowledge-based discourses in a multi-scalar context. Academic literatures disagree on

how universities may feel global effects, with accounts varying in their consequences from a fundamental epistemological challenge to an emphasis on embracing the opportunities of the 'new' knowledge era through replicating business-models or engaging with local communities (Smith and Webster, 1997; May and Perry, 2006a). Whether 'crisis or opportunity' (Harloe and Perry, 2004), a consensus is apparent on two fronts: first, that taking the dynamics of the knowledge economy leads to profound consequences, negative or positive, for the university and second, that understanding implications requires consideration of the relationship between the external and the internal vis-à-vis the interpenetration of knowledge-based discourses within diverse institutional settings (Baker and May, 2002).

Examination of universities provides an object focus which spans the boundaries between literatures within STS and regional development studies. A process can be seen in which multi-scalar knowledge-based discourses create the circumstances for universities' sub-national links, but in which entrepreneurship and sub-national engagement are only one of many potential responses to the tensions and pressures then created (Goddard and Chatterton, 2001). Universities have varied roles to fulfil: to educate and train students; to produce excellent research according to peer-reviewed criteria; to innovate in order to enhance productivity through collaborative relations with external partners; to produce relevant research according to the needs of client organisations; to make socio-economic contributions to their localities and businesses in general and to enhance civic value in the public realm (Clark, 1998).

Mixed messages are apparent in the drives for international excellence and collaborations for regional benefit. It is held that research needs to be conducted at an international level in order to meet criteria of world class excellence. Yet, it also needs to be embedded in local and regional contexts if the kinds of benefits expected from knowledge for the economy are to be realised within a particular locality. The dynamics of the knowledge economy, with its league tables, knowledge hierarchies and linear output mentalities, may be said to orient universities everywhere but to their immediate localities (Greenwood, 2007) with the result that we see the intangible in a search for the unattainable (May and Perry, 2006b).

The role of universities as knowledge producers is increasingly valued in particular ways, with an emphasis upon their relationships with businesses, governments and society in general. We live in a world where 'quick hits' drive criteria of relevance. Universities are now seeing themselves as significant economic actors in their own right and their roles in the production of public goods – whose benefits are not reducible to narrow economic calculation – is diminishing. Indeed, universities are also spaces for reflection and need to establish their distinctiveness as sites of knowledge production in a super-speed age. The absence of a call for immediate application, combined with particular professional cultures, leads to a different – and unique – form of knowledge being produced within universities. Valuing this function is of central importance if the place and role of the university in society and the research that is conducted within it, is not to give way to a short-term instrumentalism.

Defining the legitimate boundaries between universities and wider social actors, whether at national or sub-national levels, is critical, through an open dialogue about the strengths and limitations of different kinds of institutions. Universities are multi-faceted and varied institutions. Nevertheless, like 'business', they tend to be treated as a homogenous mass when it comes to expectations around the knowledge economy. Greater understanding is needed not only of what universities should do, but also

what functions and expectations other kinds of organisations are best able to perform. Are universities purely strategic actors in urban growth coalitions, important in relation to their employment contributions, spending power and estates or is KBUD predicated on more fundamental shifts in modes of knowledge production (Gibbons et al., 1994)? In the absence of this debate, universities are often seen as assets, instruments or targets for national and regional policies, without an understanding of their distinctiveness or wider societal value, thus minimising the potential transformative effects of their interactions with urban areas. An emphasis upon acquisitions, rather than process-driven KBUD, then results (Perry, 2008). Building an open understanding of the balance between universities as places of expectation and spaces for reflection and how they should best engage with local actors is critical for the future of sustainable development.

3.3 Science economy and knowledge society

These sets of issues feed directly into the relationship between a narrow science-based economic view of the knowledge economy and a wider set of concerns with how society develops more inclusive knowledge-based futures. Most writers on the subject date the concept of the knowledge economy in the academic literature back to the influential work of Daniel Bell (1974) who has often been credited as being the first to recognise the key role of knowledge as a factor in the production and reproduction of economies and societies (Allen, 2000; Bryson et al., 2000). A number of key characteristics have been highlighted as evidence of the knowledge economy. For some, the most obvious of these are the proliferation of high-tech industries and the expansion of the scientific base; the move away from manufacturing to a service-based economy and the development of new information technologies and accelerated technological transformations (Neef, 1998). Others stress the growth of symbolic goods, demassification and the boundaryless firm (Burton-Jones, 1999). Information technologies, while important, are only one catalyst in the increasing role and importance of knowledge in the economy, with growing recognition of the economic value of tacit knowledges and extra-economic resources in creating competitiveness. More significant evidence of the fundamental shifts that have taken place in the economy can be seen in the increasing complexity and sophistication of processes of production and products; the necessity for and increasing reliance on specialist and idiosyncratic skills; the rising importance of the use and transfer of knowledge for economic activities and the application of knowledge to knowledge (Bryson et al., 2000).

A set of key assumptions underpin the 'new' – or, at the very least, strengthened – knowledge paradigm. Knowledge is viewed as a panacea to specific economic problems, with a strong instrumental and strategic role. We cannot simply see science as a practice being produced in the service of interest-free illumination, or even emancipation, but bound up with the very reproduction of the economy. Knowledge more generally now becomes a tool which can be appropriately wielded to produce competitive advantage. To achieve this aim, it is to be harnessed, codified, managed and stored. The commodification of knowledge and its translation into direct economic advantage becomes paramount, as does the ability to measure, define and demonstrate success in knowledge hierarchies through metrics and league tables of innovative output in the struggle for economic-symbolic advantage.

Accompanying a neo-liberal discourse is another, less popularised, debate concerning the 'knowledge society'. Here, similar assumptions are made about the potential solutions or fixes offered by knowledge to societal problems. Whilst seemingly offering a more civic or social view of the role of knowledge, popular conceptualisations of the knowledge society still trace an economic output logic in terms of more education = better skills = economic competitiveness. A second element to this debate, however, is less instrumentally driven, in terms of the changing role of knowledge, evidence and expertise in democracy and policy-making itself (Turner, 2003). A greater integration of 'experts' into governance systems across a range of policy-fields is apparent: whether this is the result of an increasing recognition of the importance of accurate evidence-based policy, or the result of processes of that attempt to de-politicise decision-making via technocracy, is varied.

The notion of 'engagement' thus offers itself to flexible interpretation, meaning different things in different contexts (Bjarnason and Coldstream, 2003). It is all too apparent, for instance, in the tensions between commercial and industrial-based engagements, aimed at profit and wealth creation and socially-driven engagements in which the university is better conceived as an instrument of social inclusion and participation. Interpretations of 'entrepreneurial' also remain variable, ranging from a neo-liberal market-driven conceptions of entrepreneurialism based on wealth creation, economic growth and an exceptional individualism, to a more socially-responsive, relational and stakeholder based approach. In practice, it is a neo-liberal market driven set of understandings that dominate knowledge economy discourses, as witnessed by the preponderance of enterprise and entrepreneurship courses springing up, particularly in the UK and the USA, with their emphasis on spinning-out, spinning-in, spinning-off and starting-up. Similarly, in relation to cities and the creative economy, we see the ascendance of econo-centric approaches (Smith and Warfield, 2007) that are seen to add to a neglect of deepening social divisions (Collinge and Musterd, 2009).

These issues point to greater emphasis not on the economic potentials of knowledge but its social effects. Therefore: "unless we succeed in broadly strengthening the cognitive capacities and resource base of citizens, the long term scenario might very well be a smattering of 'knowledge islands' in a great sea of marginalised outsiders. This poses the first order question of how to democratise skills [...] and it poses the second order challenge of how to redesign social policy" [Esping-Anderson (2001), p.134]. A solution is often sought in terms of a 'third way' whose advocates "believe that the population, via education, can be adapted to the market economy and the social problem will hence disappear. This is a dangerous fallacy" [Esping-Anderson (2001), p.134].

Institutional, regional and social inequalities, wrought by the dynamics of knowledge-based change, cannot be redressed without understanding the values attached to different forms of knowledge. Understanding, learning and development, empowerment and enlightenment, come through hard work and interaction, conversation and dialogue, more likely to be fostered by investing efforts in process than in the exploitation of products. The latter is important, but will not produce a knowledge economy for the many and not the few, as a former UK Prime Minister is oft-quoted as saying (Blair, 2000). It is to *knowledges*, therefore, rather than a narrowly constituted scientism, that we must look and to the contributions made from a range of academics, businesses, voluntary organisations, governmental departments and civic and social groups.

4 Urban knowledge exchange in practice

Looking across the above issues, a simple polarisation of ways of seeing practices in urban knowledge-based development is compelling. We could emphasise excellence, globalism, world-class institutions, economic outputs, products and buildings and science-driven growth. We could also stress relevance, localism, engagement, socially-defined outcomes, processes and people and a range of different knowledges. Yet, this also offers a false dichotomy. The devilish nature of the problem is in the ‘agonistic’ character of these issues (Laclau and Mouffe, 2001). There is no simple resolution or quick fix. Mixed messages float in the international political economy, culminating in a ‘missing middle’ between expectations, incentives, funding streams, scales of actions, contexts and capacities to deliver (SURF, 2009). While alternative articulations and discourses at the local level often favour exchange over transfer, interactivity over linearity, knowledges over scientism and outcomes over outputs, practices are limited by cultural, structural and institutional factors. Whilst space precludes a detailed discussion, what is important in the context of this provocation is to note the limitations on current practices.

Table 3 Ways of seeing interventions in KBUD

<i>Physical</i>	<i>Symbolic</i>
Knowledge or science is a physical agent to achieve other non-scientific goals, such as the redevelopment of deprived or industrial neighbourhoods. The focus tends to be on estate management, the reconfiguration of infrastructures and provision of ‘innovation’ spaces.	Science also has symbolic value. Investments are made in high profile areas as a crucial part of building a positive image and reinventing regional identities. Initiatives are not designed to lead directly to improvements in economic performance, but to enhance reputation, image and scientific credibility.
<i>Additive</i>	<i>Transformative</i>
A third type of intervention focuses on gaining additional resources through capacity-building and enabling regional institutions to better compete in national and European competitions. These additional resources may be stitched together from a variety of sources for city-regional/regional benefit. Interventions may also be aimed at attracting knowledge workers or knowledge-intensive businesses as a basis for competing globally.	KBUD can be transformative, with investments designed to direct the science base towards regionally important areas of research. This involves not only linking science with industry but determining scientific priorities and the reorientation of universities towards regional and local socio-economic needs.

KBUD, in practice, is more often about the physical redevelopment of places and spaces, or symbolic work in which excellence and relevance are pursued as independent activities (Table 3). Existing attempts to bring together researchers and stakeholders at the urban scale around, for instance, the environment agenda have tended to be ‘one-off processes’ rather than being systematic and inclusive in orientation. The development of more holistic, rather than piecemeal, frameworks for knowledge exchange at the urban level has been absent. Bilateral practices in knowledge exchange between universities and industry have been the subject of work, but little is known about how to upscale innovative practices to the level of urban governance. All too often, urban policies are

reduced to the translation of nationally-set priorities into local contexts, rather than attempts at the transformation of urban futures, with a clear gap in understanding the strategies that cities can pursue in their transitions to knowledge-based economies and societies and a need for greater social learning and ‘policy transfer’ (Evans, 2009). As a result, urban partnerships are often bystanders or passive facilitators, rather than active agents in the intermediation of knowledge economy dynamics for sustainable urban futures.

4.1 Towards active intermediation

Two issues need better understanding as precursors for effective urban knowledge exchange. Many accounts of contemporary changes fail to acknowledge the importance of context in mediating the ways in which global pressures for knowledge-based development touchdown in different places. Policy statements, as well as academic accounts, tend to offer hyperbole instead of a context-sensitive understanding of how different places, with their multi-layered political, economic and cultural identities, can develop knowledge-based futures. Spatial settings provide crucibles in which issues of politico-economic, institutional and disciplinary contexts react and collide. However, there is an increasing spatial polarisation between the ‘science haves and have nots’, as well as differences in the capacities and capabilities of cities in different contexts to act (Athey et al., 2007). This raises a critical question over the strategies that ‘ordinary places’ can employ to harness both indigenous and exogenous knowledges for socio-economic benefit (Perry and May, 2007; Hodson, 2008).

There are also differences in levels of national acknowledgement of and support for KBUD in cities, which are endowed with varying governance functions, responsibilities and structures (Yigitcanlar et al., 2008b). Even within a single national context, formal capacities to address contemporary issues differ, with asymmetrical governance structures in Spain or Italy, for example, creating sub-national specificities. History also matters and approaches to innovation in the context of the knowledge economy are path-dependent (Pickstone, 2005; Simmie et al., 2008).

If context-sensitivity is essential, it meets the tendency to look for ‘one-size-fits-all’ solutions that characterises many accounts. The widespread vaunting of ‘models’ and ‘success stories’ for importation to a variety of contexts is illustrative of an ‘exemplary politics’ in the face of which the distinctiveness of place evaporates with the result that the model of reality slips into the reality of the model (May and Perry, forthcoming). Through our work we have seen how paradigmatic examples are often held up as unrealistic yardsticks against which to judge the progress or failure of different places. There are no quick fixes to this process and models are moved across contexts as if they were a panacea for social and environmental problems, thereby relieving their recipients of the efforts needed to reach understanding, let alone coordinate their actions. A regurgitation occurs without due consideration to content, limits or contextual factors. There is also a need to avoid ‘fracosomania’, defined as “the belief that the existing system has so irredeemably failed that only its wholesale replacement by an imported model can bring about improvement” [Burtscher et al. (2006), p.252]. What often results is a layering of the old with the new, or the construction of new strategic frameworks around ‘old’ ways of seeing. Plus ça change, plus c’est la même chose.

Cities, as crucibles for science, research, economy, society, culture and politics, mediate external pressures for knowledge-based change. The same can be said of

universities as they respond to differential funding sources, expectations and internal incentive structures, or of local authorities and regional development agencies as they strive to meet the targets and incentives often set from on high. Such mediation is usually passive or accidental and occurs in ways that do not always accord with the notion of deliberate strategy. Organisational incentives, targets, structures and cultures act in unintended ways to protect, shelter, mediate or magnify external pressures. Mediation is then variable, leaning either towards translation or insulation, with potential positive, but more often than not, negative results. Far from seeking to actively manage external pressures, dichotomies or agonisms in terms of clear and confident values and the interpretation of consequences and adaptation to various pressures, we see a magnification of turbulence at the urban level.

Intermediary organisations emerge to populate such ambiguous environments, yet their efforts are limited to being translational, rather than transformational. They can act to keep cultures of enquiry and reception apart, reinforcing in the process the importance of their own function through allusion to universities or industries who never meet. They may have funding, but little, if any, effect on understanding and this is evident in the perpetuation of a project and grant mentality, with success being judged by narrow measures and indicators. These forms of working overwhelm innovative practice and learning. Allusions to ignorant and resistant publics or academic obfuscation are not helpful in this process. There is no substitute for continual efforts that are aimed at coherent, consistent, coordinated and well communicated understandings between parties. Such work is not an annoying distraction, but a necessary precondition for facing contemporary urban challenges. A license to think outside of the box is needed for all parties to learn, imagine and act. That means creating spaces in which it is acceptable to combine knowledge and imagination free from immediate consequence and also a preparedness to admit of and learn from failures.

The need for new ideas and the integration of what is already known is now greater than ever. In the search for the new, we must not forget the past. Disparate knowledges can be integrated, seen alongside each other and re-contextualised. Sharing individual understandings can generate new social learning. Only then, does it become possible to know when and how knowledge has had particular outcomes that are seen, by different parties, to have had benefits or contain potentials. Considerable effort is needed in order to learn from imaginative and effective processes and there are no quick routes towards this end. It implies a willingness to learn from the past and share an understanding of orientations according to working in different contexts and what is valuable and what are the limits of those places. Research needs to resonate with experiences and issues in order that they are intelligible. There is a need for more sustained and long-term programs of work that systematically and productively take the knowledge produced by universities for socio-economic and environmental reasons, without undermining their civic and social value.

Knowledge exchange, rather than transfer, concerns the exchange of knowledge between different bodies to facilitate and strengthen links and improve practices for all concerned. A 'hypodermic' model in which grateful recipients receive the latest pearls of wisdom from those who are positioned as experts must be avoided. Knowledge exchange does not have a clear start or end point or fixed boundaries between funders, users and producers of research. It is about the active translation of work from information to intelligence according to the needs, in context, of particular groups of policy-makers,

practitioners, researchers and the public at large. A continuous and interactive relationship between research participants and users is required, in which differences in divisions of labour are recognised, negotiated, tolerated and acted upon for mutual benefit according to changes in the environments we occupy.

Key to effective exchange is an understanding and recognition of different cultures of enquiry and reception, as well as the limitations to current understanding. Knowledge must be produced and communicated rather than simply transferred. Knowledge needs to be actively received, understood and interpreted and its processes of production informed by different groups. The reception of research requires more consideration than has been provided thus far. Without some understanding of use in context – which is not a one-way relation of research to practice, but also of practice informing research – exchange is an activity without substantial benefit. Knowledge exchange does not therefore take place between two separate spheres of activity, but is a space of communication where different cultures of enquiry and reception can engage through drawing upon different forms of knowledge exchange (Figure 1).

Figure 1 The SURF framework for context-sensitive knowledge exchange (see online version for colours)



Source: SURF (2009)

Such a space of communication is frequently absent and we have found knowledge, context and action existing in a dynamic tension that is often unconnected. Populating what we have called the ‘missing middle’ requires active intermediation between research and different social interests in order to mutually constitute a shared understanding of the need for knowledge exchange. Many organisations believe they are already performing the role of actively translating – or intermediating – between realms of activity. Yet, in practice they are often little more than storage facilities and so become accelerated conduits for pushing more and more information into organisations, rather than producing intelligence to aid capacity and capability to effect change. We need a mode of operation in which knowledge is produced by interaction between parties, allowing the *know-how of practice* to inform the production of *knowledge for practice*. This represents a challenge not only to research funders and performers, but to governments at multiple scales and to their policy-makers.

The concept of the ‘active intermediary’ chimes with contemporary academic understandings of knowledge exchange yet seeks to address the limitations of existing intermediaries that sit between, but often keep apart, actors in the research-practice interaction (SURF, 2009). An active intermediary extends and enhances existing understandings of ‘gatekeepers’ in research and practice, through reference to multi-partner organisations, as well as individuals (cf. Allen, 1977; Tushman and Katz, 1980). Active intermediaries seek to not only translate, but also transform, practices in cultures of knowledge production and reception and hence create the potential for more sustainable knowledge-based urban futures.

5 Conclusions

Issues discussed in this paper highlight a number of challenges for urban knowledge exchange. In implementing KBUD in different contexts, sensitivity to place-based dynamics is critical, as well as the need to actively intermediate between different parties to enable a productive relationship between knowledge and space to be forged. Yet these issues can only be addressed by breaking out of silo mentalities. Narrow ways of thinking and working not only reflect but also reinforce the ways in which organisations tend to operate, linked to incentive structures, cultures and promotion schemes. Interdisciplinary dialogue is critical, as well as inter-sectoral debate. It is all the more important if local actors are to harness and integrate the diverse set of insights needed to address contemporary challenges of sustainable urban development and building low carbon futures. Bilateral understandings of what works in knowledge exchange need to be upscaled to the urban level. We have seen a wide range of important experiments at the edge of the mainstream that work to foster innovation or sustainability *despite* not *because of* public sector or private sector constraints. Up-scaling requires new ways of funding and organising research to encourage the co-production and exploitation of knowledge in, for and with, local areas. Qualitative understandings, as well as quantitative studies that do not assume linearity, are needed if the target-driven, incentive-based cult of the measurable is to be overcome.

These issues point to the need to consider the pre-requisites for overcoming the ‘devilish dichotomies’ outlined earlier. Local authorities and their intermediary organisations need a better understanding of not only ‘what’ should be done at the urban scale to improve the effectiveness of knowledge exchange, but ‘how’. Three important

steps are then required: first, the consolidation, integration and sharing of existing knowledge for the benefit of urban areas; second, better learning between places and enhanced understanding of the strategies that cities can pursue in their transitions to knowledge-based economies and societies and third, the development of more holistic, rather than piecemeal, frameworks for knowledge exchange at the urban level, which transform as well as translate and enable the up-scaling of innovative practices. Communication, consensus and coordination are critical, built on ways of thinking that reject simplistic polarisations and established frameworks for understanding. What this highlights is the need to delineate an action-research agenda for those working between academia, policy and practice to form ‘urban knowledge arenas’ in which existing and new knowledges can be integrated, developed and enhanced for the benefit of cities and their populations.

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