

The London School of Economics and Political Science

**The Economics of Cultural Diversity: Lessons
from British Cities**

Max Nathan

London School of Economics, Spatial Economics Research
Centre and LSE Cities

A thesis submitted to the Department of Geography and Environment of the London
School of Economics for the degree of Doctor of Philosophy. September 2011

Declaration

I certify that the thesis I have presented for examination for the PhD degree of the London School of Economics and Political Science is solely my own work other than where I have clearly indicated it is the work of others. In the case of the paper 'Does Cultural Diversity Help Innovation in Firms?', the paper is joint work with Neil Lee. My own contribution comprises 60% of the whole.

The copyright of this summary chapter, and the thesis, rests with the author. Quotation from it is permitted, provided that full acknowledgement is made. Reproduction is not permitted without the prior written consent of the author.

I warrant that this authorization does not, to the best of my belief, infringe the rights of any third party.

Max Nathan

Abstract

This thesis examines the economic effects of cultural diversity; it focuses on recent experience in British cities, and on links between migrant and minority communities, diversity and innovation. Like many western societies Britain is becoming more culturally diverse, a largely urban process driven by net immigration and growing minority communities. Despite significant public interest we know little about the economic impacts. This PhD aims to fill these major gaps.

First, I explore connections between diversity, immigration and urban outcomes. I ask: does diversity help or hinder urban economic performance? Initial cross-sectional analysis finds positive associations between ‘super-diversity’ and urban wages. Using panel data and instruments to establish causality, I find that net immigration helps raise native productivity, especially for high-skilled workers, but may help exclude lower-skill natives from employment opportunities. De-industrialisation and casualisation of entry-level occupations partly explain the employment results.

Next I investigate links between co-ethnic groups, cultural diversity and innovation. I explore effects of co-ethnic and diverse inventor groups on individual members’ patenting rates, using patents microdata and a novel name classification system. Controlling for individuals’ human capital, I find small positive effects of South Asian and Southern European co-ethnic membership. Overall group diversity also helps raise individual inventors’ productivity. I find mixed evidence of effects on majority patenting.

I then explore the case of London in detail, using a unique survey of the capital’s firms. I ask: does organisational diversity or migrant/ethnic ownership influence firms’ product and process innovation? Results show small positive effects of diverse managements on ideas generation. Diverse firms are more likely than homogenous firms to sell into London’s large, cosmopolitan home markets as well as into international markets. Migrant entrepreneurship helps explain the main result.

Together, these papers make important contributions to a small but growing literature on diversity, innovation and economic development.

Acknowledgements

Many thanks to Henry Overman and Ian Gordon for outstanding supervision, to Malo Hutson for hosting me at UC Berkeley, and to Lou and my family for love and support.

Thanks to Philippe Bracke, Maria Carvalho, Tony Champion, Riccardo Crescenzi, Ted Egan, Giulia Faggio, Tommaso Frattini, Steve Gibbons, Ben Gidley, Harvey Goldstein, Christian Hilber, Jennifer Hunt, Simona Iammarino, Kath Jones, William Kerr, Mark Kleinman, Jed Kolko, Neil Lee, Carlo Menon, Max Neiman, Ceren Ozgen, Andrés Rodríguez-Pose, Rosa Sanchis-Guarner, Allen Scott, Will Somerville, Madeleine Sumption, Carlos Vargas-Silva, Vivek Wadhwa, Kim Walesh, Niels Westergaard and Peter Wood for advice, comments and ideas along the way.

I am grateful to Pablo Mateos at University College London's Centre for Advanced Spatial Analysis, Gianluca Tarasconi and Francesco Lissoni at Università Bocconi, Matthew Waite at the Greater London Authority, and the Office of National Statistics Virtual Microdata Lab, without whose data these papers could not have been written.

Previous versions of the papers were presented at the following conferences: the Association of American Geographers (2010 and 2011); the North American Regional Science Council-Urban Economics Association (2009); the Regional Studies Association Early Careers group (2010); the Regional Studies Association (2011); the Spatial Economics Research Centre (2010) and University College London/NORFACE (2011). In addition papers were discussed in seminars at SERC/LSE, COMPAS/Oxford University, the Institute of Urban and Regional Development/UC Berkeley and at the universities of Liverpool and Manchester. Thanks to all participants for helpful feedback.

The Economic and Social Research Council (ESRC) and the Department of Communities and Local Government provided generous financial support. The views expressed in this thesis do not necessarily represent those of the Department or the ESRC. This work also contains statistical data from the Office of National Statistics (ONS), which is Crown copyright and reproduced with the permission of the controller of Her Majesty's Stationery Office and Queen's Printer for Scotland. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets that may not exactly reproduce National Statistics aggregates. All errors and omissions remain my own.

Introduction, critical discussion and conclusion

1. Introduction

This thesis explores the economic impacts of cultural diversity: it focuses on recent experience in British cities, and on links between migrant and minority communities, diversity and innovation. Like many Western societies Britain is becoming more culturally diverse, a largely urban process driven by net immigration and growing minority communities. These are issues of great importance for the public, business and policymakers. However, we know little about the real economic impacts of immigration and diversity, and little about which policy choices maximise welfare in these areas. The thesis aims to fill these important gaps; it comprises four papers, which form the subsequent chapters of the document.

This introductory chapter provides an overview and synthesis. I begin with a brief discussion of some basic concepts and the UK policy context. Next, I survey academic perspectives on cities and cultural diversity, before introducing economic frameworks in more detail. I identify three main research questions and outline the metastructure of my primary research. I provide brief summaries of each paper's methods, results and contribution, before concluding with some more general thoughts and lessons for policymakers.

2. Background and motivation

There is a vast and sprawling literature on cities and cultural diversity, covering (among others) historical, ethnographic, sociological, social capital, urbanist and post-colonial perspectives, as well as a large body of economic research. The economic literature has been dominated by two major debates. First, labour economists have developed a large literature on both the migration decision, and the effects of immigration on sending and receiving countries. In the case of receiving countries, analysis has largely focused on labour market impacts for natives, and on

broader social and economic outcomes for migrants ('immigrant integration') (Dustmann et al., 2008, Kerr and Kerr, 2011). Second, in the development and economic growth fields a number of country-level studies have explored the impact of cultural, ethnic and linguistic divisions on long term economic, social and political outcomes (Ranis, 2009, Fernandez, 2010).

Four strands of current thinking on growth and economic development suggest the potential for a broader approach. First, endogenous growth theories highlight the importance of human capital in driving productivity and long term growth, and in sustaining spatial disparities (Romer, 1990). Second, research in economic geography highlights cities' productivity-enhancing functions, in particular via knowledge spillovers and economic diversity (Jacobs, 1969, Duranton and Puga, 2001). Third, theoretical and experimental studies suggest that the diversity of economic agents may accelerate the creation of knowledge, or improve the quality of ideas (Page, 2007, Berliant and Fujita, 2009). Fourth, these studies also suggest co-ethnicity and diversity channels may be amplified in urban areas through agglomeration effects, large migrant/minority communities and a cosmopolitan city population's taste for new and diverse goods and services.

In recent years a small number of empirical studies have started to combine these elements. For example, in spatial economics, Ottaviano and Peri (2005, 2006) have explored the effects of cultural and linguistic diversity on urban economic performance. In economic sociology Saxenian (2006) has investigated the role of migrants and diasporic communities on regional economic development and high-technology sectors. Meanwhile, in economic geography Richard Florida has argued that a cities need to attract a tolerant, diversity-loving 'creative class' in order to maintain long term economic success (Florida, 2002).

This thesis contributes to this growing literature on the economic effects of immigration and diversity: in particular, it explores impacts on innovation and urban economic development.

2.1. Endogenous growth and the economic role of cities

The first building block of my research is the continued relevance of cities, and the role of endogenous growth and economic geography frameworks in explaining this. Over 50% of the world population now live in urban areas, and this share is predicted to keep rising. Despite predictions of the 'death of distance', large urban centres remain of great demographic, social and economic importance. As McCann argues, "the global economy appears to be simultaneously characterised by global flattening and local steepening" (2008) (p361). Other see it as 'spiky' (Florida, 2005) or an 'archipelago economy' of linked urban centres (Veltz, 2000).

Geographers have developed a variety of frameworks for understanding cities and urban systems. Peet (1998) provides a brief history, from the cultural and regional geography of the 1920s and 1930s, through to the 'quantitative revolution' of the 1950s and 60s and the emergence of radical and environmental perspectives in the 1970s. There has been a proliferation of approaches in the past few decades: realist perspectives, postmodernist frameworks and a re-emergence of quantitative approaches in the 'New Economic Geography'.

Some of these frameworks provide important foundations for the thesis. From an urbanist perspective Jane Jacobs proposes we view neighbourhoods and cities as 'problems in organised complexity' (Jacobs, 1961). Unpicking urban systems requires a focus on the economic, social and cultural processes shaping areas from the outside, as well as close observation of local actors and specificities. Critical realist Doreen Massey similarly argues that local economies are the product of national / global processes, but that local conditions produce variety and uniqueness (Massey, 1984). Michael Storper's 'transformationalist' approach develops this line further, arguing that capitalism is structured by societal specifics and thus 'the local helps make the global' (Storper, 1997).

Storper is also clear that to understand the continued relevance of cities under globalisation, geographers need to use the tools of other disciplines. His 'heterodox paradigm' combines elements of economics, sociology, management science and geography to explain regional development as a relational process, with regions as

the nexus of formal economic interactions and informal 'untraded interdependencies' (Storper, 1997). Within regions, cities are 'socio-economies' that play critical roles in the organisation of high-value economic activity.

These geographical frameworks repeatedly intersect with those of urban economics (UE) and the 'New Economic Geography' (NEG). These latter are particularly helpful in explaining the location patterns of economic activity. While classical models of economic growth predict the long run convergence of countries and regions, in practice spatial disparities between and within countries turn out to be persistent.

Endogenous growth theories help to explain these trends by highlighting the importance of human capital and knowledge in advancing the technological frontier. Subsequent productivity gains help drive countries' long term economic growth and development (Lucas, 1988, Romer, 1990). National and regional differences in knowledge creation and diffusion thus help explain spatial disparities – both across and within countries. In these frameworks, human capital spillovers are the key channel for both the diffusion of existing ideas and the development of new ones.

Drawing on these ideas, both UE and NEG have developed a number of insights that help explain the behaviour of urban systems and spatial economies, and thus explain spatial differences. In these accounts of long term growth, cities play a number of important and well-established roles. Both perspectives partly develop out of Marshall's ideas on agglomeration economies: thick labour markets, input-sharing and knowledge spillovers that help raise firms' productivity in urban environments (Marshall, 1918). Jane Jacobs (1969) extends these ideas by highlighting the importance knowledge spillovers across sectors. Cities' long term economic resilience is thus partly a product of economic diversity, which facilitates innovation.

UE and NEG approaches share many insights, but also contain important differences of emphasis (Combes et al., 2005, Glaeser, 2008). Urban economics frameworks begin with the spatial location models of Alonso (1964), Mills (1967) and Henderson (1974). These models focus on the balance of agglomeration economies

and diseconomies in a system of cities (Combes et al., 2005). Productivity gains driven by agglomeration effects help raise nominal wages and (often) employment rates; conversely, urban crowding in growing cities raises costs and eats into real wages. In spatial equilibrium, labour, housing and amenities markets clear, real wages equalise and workers and firms are indifferent between locations.

New Economic Geography begins with firms' location decisions under globalisation, assuming monopolistic competition and both internal and external scale economies (Krugman, 1991). As transport costs decline, internal increasing returns mean that firms will want to consolidate activity in single large plants and to specialise production. Agglomeration economies, notably upstream-downstream linkages and local knowledge spillovers will lead to clustering (Krugman and Venables, 1995). Conversely, congestion, pollution and competition may lead firms to exit. Overall, the balance of 'centrifugal' and 'centripetal' forces determines the location of economic activity (Fujita et al., 1999). The clustering process is characterised by feedback loops, so that existing agglomerations often have first mover advantage (Krugman and Obsfeldt, 2003); however, technological change and sectoral differences also tend to produce 'production jumps' from higher to lower cost regions (Venables, 2006). These jumps occur within sectors as well as between them: Venables gives the example of a financial services firm with offshored call centres, IT services outsourced to local partners, an international network of retail branches and a London-based headquarters. These complex production chains require careful co-ordination, and can imply high search, transaction and management costs (McCann, 2008, Saxenian and Sabel, 2008). Most recently, the 'globalisation of innovation' has seen the international re-organisation of increasingly high-value, 'knowledge-intensive' activities (Mudambi, 2008).

Both perspectives help explain important stylised facts for UK cities. Recent structural shifts in national economies – in particular, an increased share of employment in services and 'knowledge-intensive' activity – have helped to accelerate the sorting of employers and skilled workers across urban areas (Overman and Rice, 2008). Urban environments play increasingly important roles in local knowledge spillovers and ideas flow, by supporting face to face interactions and other 'learning' economies. At the same time, there are important differences in the

'demand for cities' between and within sectors, and across the lifecycle (Champion and Fisher, 2004, Graham, 2007, Melo et al., 2009).

2.2 Cultural diversity

The second building block of my research is the notion of 'cultural diversity', in particular as it relates to the city: as Amin (2002) makes clear, cities are the primary sites of cultural diversity. While multicultural societies and cities are usually seen as new phenomena, their roots often go back for centuries (Sandu, 2004). Britain and many other European societies share a long history of demographic change. Migrations typically resulted in new minority communities assimilating, to different degrees, into the cultural mainstream (Sassen, 2004). In his history of London, for example, Peter Ackroyd writes that "by the tenth century [the city] was populated by Cymric Brythons and Belgae, by remnants of the Gaulish legions, by East Saxons and Mercians, by Danes, Norwegians and Swedes, by Franks and Jutes and Angles, all mingled and mingling together to form a distinct tribe of 'Londoners'" (Ackroyd, 2000).

Cultural diversity is not straightforward to define. As the popular discussion around this summer's riots in London and other English cities makes clear, disentangling culture and ethnicity from class, education and other socio-economic factors is both important and difficult to do. Quantitative approaches have much to offer in principle, helping to illuminate over-arching trends, patterns and relationships; but they are hard to implement. Diversity metrics typically borrow from demographics or industrial economics, deploying Fractionalisation and other indices. However, accurate measurement of diversity requires a robust measure of cultural or ethnic identity. This is challenging, as identity is a multifaceted concept with objective, subjective and dynamic elements (Mateos, 2007, Aspinall, 2009).

Quantitative measures of identity thus tend to be partial: they focus on identity's visible, objective components, assuming away self-ascription and endogeneity issues (Ottaviano et al., 2007). For quantitative researchers, therefore, identifying identity involves a least-worst proxy, such as country of birth, language or religion – or official ethnic typologies, such as those built by the UK Office of National

Statistics (ONS) (Office of National Statistics, 2003). Aspinall (2009) argues that all such identity proxies offer a trade-off between ‘granularity’ and ‘utility’, between high levels of detail and wider tractability.

I discuss definition and measurement issues in greater detail in the next chapter. Over the course of the thesis I make use of three identity proxies: country of birth, ONS ethnic groups, and the ONOMAP cultural-ethnic-linguistic (CEL) name classification system. These are used to construct measures of immigrant and ethnic groups, and measures of cultural diversity at firm, group and area level. Each proxy offers a different balance of granularity and utility. More detail on the classifications is given in Appendix A, and the ONOMAP system is explained in Appendix B.

2.3 UK context

The economic impacts of immigration and diversity have particular salience for the UK and for British cities. Britain and many other Western societies are becoming more culturally diverse, a process driven by both net immigration and the growth of new and established minority communities (Champion, 2006, Putnam, 2007). In 2007 immigration accounted for 52% of overall UK population growth, with natural change explaining the remaining 48%. Natural change is taking a rising share of overall change, and since 2007 has overtaken migration as a driver of population growth. Natural change includes a rising share of live births to mothers born outside the UK; this is currently running at over one in four (Office of National Statistics, 2011).

In turn, this reflects both higher levels of recent migration and higher birth rates in some minority groups (Performance and Innovation Unit, 2003). Between 2001 and 2009, non-White British groups in England and Wales have grown from 6.6m to 9.1m and now comprise one in six of the population (Office of National Statistics, 2011). Projections for the UK suggest that minority ethnic populations are likely to comprise 21% of the population by 2050, from 7.7% in 2001 (Wohland et al., 2010).

These trends make the UK's current and recent experience an important area for study. Not surprisingly, there are also very high levels of public and policy interest in these issues in the UK. Of course, worries about diversity are not new. In the year 883 King Alfred banished the Danes from London, restricting them to land east of the river Lea (Keith, 2005); Vertovec (2007) chronicles complaints across medieval Britain that "foreigners were practising their own customs".

However, over the past decade and a half diversity and immigration have become particularly high-profile agendas. Race and immigration are now commonly chosen 'most important issues' in public opinion surveys (Blinder, 2011). While attitudes to immigration and diversity vary significantly by class and education, overall large majorities of British people oppose mass immigration: the Government's most recent Citizenship Survey, taken in 2009-10, found that 78% of respondents favoured reducing immigration, 56% by "a lot" (Blinder, 2011). By contrast, UK business voices have been strongly supportive of open immigration policy, to help firms fill skills gaps and hire from global talent pools (McSmith and Russell, 2007, London First, 2008, BBC, 2010), and the business community has taken a similarly supportive stance on workforce diversity.

Reflecting these complexities, national immigration policy has undergone several major re-organisations since 2001 (Somerville, 2007). Immigration was a major issue in the 2010 UK election. While the previous Labour administration sought to encourage skilled migrants via a points-based entry system, the current Coalition government has capped net migration, with significant restrictions on entry for those outside the EU. Significantly, it has retained the Migration Advisory Committee (MAC), which provides intelligence on sectors and occupations facing skills shortages.

There is a continued debate on the wider impacts of growing diversity on the economy, society and public services (see for example (Goodhart, 2004, Putnam, 2007, Caldwell, 2009, Simpson and Finney, 2009, Fanshawe and Srisandarajah, 2010, Goodhart, 2010). Since 9/11, 1980s models of multiculturalism have come under increased criticism, and both Labour and the coalition government have developed policies emphasising integration and community cohesion. Reflecting this,

broader public and policy debates have tended to focus on issues of religious/racial tension and social cohesion, and on British towns and cities – such as Burnley and Oldham – that have seen ethnic / racial disturbances in recent years. The wider economic dimensions of diversity have tended to be underplayed (Wolf, 2008).

These issues have a distinctive urban footprint. Migrants and minority communities are unevenly distributed across the UK, with the highest numbers in cities. Since 2004, a number of rural areas and small towns have experienced very rapid growth in migrant populations (Bassere et al., 2007, Green, 2007a); however, bigger British cities still contain the largest migrant volumes and population shares. In 2002-3, over half of all net migration was to London, and over half of the rest was to the other conurbations and large cities (Champion, 2006). The urban share of both migrant groups and visible minorities has been increasing over the past decade and a half.

These are important times to be studying such issues. The economics of immigration and diversity is of great concern to national government, with policymakers needing to balance public opinion, local community dynamics and business interests. Many city leaders also need to manage larger, more diverse populations to maximise economic and social benefit. And as we shall see below, there remain important evidence gaps on the economic impacts of immigration and cultural diversity in the UK.

3. Cultural diversity and cities: perspectives

The literature on diversity and urban places is large and itself diverse. It includes historical analysis, such as the history of 'creative cities' (Hall, 1998) or the role of migrants in developing the 19th century Atlantic Economy (Crafts and Venables, 2001); ethnic group studies, covering the prospects and progress of (for example) Jewish, Italian and Caribbean communities in the US and UK (Sante, 1998, Sandu, 2004); the post-colonial literature, exploring diasporas, the development of cultural identity and the changing nature of 'home' (Gilroy, 1993, Urry, 2000); urban sociology, exploring related ideas of the cosmopolitan, transnational or 'mongrel' city

(Smith, 2001, Sandercock, 2003, Keith, 2005); health (Fernandez, 2010); a number of studies looking at political participation, social capital and community cohesion (Alesina and La Ferrara, 2004, Putnam, 2007) as well as a related literature on segregation and immigrant integration (Landry and Wood, 2008, Simpson and Finney, 2009); development studies examining the role of ethnic fractionalisation in social development (Collier and Hoeffler, 1998); and a wide-ranging economic literature covering management and organisational performance, labour markets and human capital, entrepreneurship, innovation, productivity and the cost of living. These are discussed further in the next section.

As noted above, within the economic strand there are two traditional preoccupations. First, there is an extensive literature on the migration decision, and on immigration's impact on sending and receiving countries. In the latter case the focus is on migration-related labour supply shocks (for reviews see Dustmann et al (2008) or Kerr and Kerr (2011)). Researchers have focused on both the effects of immigrants on natives – at local and national scales – and on the social / economic outcomes of immigrants. Most recently within the UK, Anne Green and colleagues have conducted a number of important studies exploring the labour market effects of, and outcomes for migrants from Central and Eastern European countries that have recently joined the EU (Green et al., 2007a, Green et al., 2007b, Green, 2007b, Green, 2008, 2009). Despite the largely urban footprint of immigration to the UK, few studies have looked at the urban level (see below).

Second, in the development studies and economic growth fields a number of country-level studies have looked at the role of 'ethno-linguistic fractionalisation' in affecting long-term economic development. Ranis (2009) reviews this literature, suggesting that the low population density of some countries in sub-Saharan Africa makes it even harder to generate trust relationships across ethno-linguistic groups – conversely, smaller, more highly populated Asian countries have been better able to foster the necessary social capital. Specifically, fractionalisation reduces trust and increases transactions costs (Collier and Hoeffler, 1998). Some recent studies have also made use of genetic distance data (Spolaore and Wacziarg, 2009) and global values surveys (Gorodnichenko and Roland, 2011) to proxy cultural commonality and difference, and its effect on countries' economic performance. A number of

researchers, in particular Ottaviano and Peri (2005, 2006, 2007), have extended these analyses to cities in the US and EU.

4. The economics of cultural diversity: frameworks

This thesis develops a broad-based view on the economic effects of cultural diversity, drawing on the economic literature and more widely. Specifically, I explore two crosscutting topics: first, links between immigration, urban population mix and the economic performance of cities; second, connections between migrant communities, diversity and innovative activity at individual, group and firm level. Basic theoretical frameworks are set out below: the relevant chapters provide more detail, and cover relevant empirics.

4.1 Immigration, diversity and urban economies

How might net immigration and growing cultural diversity affect urban economic performance? In recent years a number of influential authors have suggested that there are significant economic gains from migration and diversity, especially in cities (Florida, 2002, Legrain, 2006, Landry and Wood, 2008, Leadbeater, 2008).

In the geography field, much of the thinking in this area has been driven by Richard Florida's 'Creative Class' framework (Florida, 2002). Florida argues that in the US, UK and other Western countries, economic, demographic and social shifts have seen the emergence of a skilled, liberally minded 'Creative Class' of workers. Members of the Creative Class have a preference for diverse, cosmopolitan urban neighbourhoods. Employers – and thus, jobs – follow the Creative Class to specific cities. Urban employment rates and investment rise, as do firms' innovation and productivity (although urban inequality may also increase). These 'Creative Class' perspectives have become pervasive among policymakers, but have been criticised for their lack of empirical foundation (Glaeser, 2005, Nathan, 2007). There is certainly a need to subject these ideas to further testing.

Economic and economic geography frameworks suggest a wider set of perspectives. In a spatial economy, net immigration increases the size of the labour force. Immigration also changes population and workforce composition, increasing diversity. This may be direct through the arrival of new people and/or departure of existing workers, and indirect via impacts on birth rates. The overall effects on urban economic outcomes are ambiguous. Under neoclassical assumptions, the main effects are through the labour market. In small open economies – like cities – average wages are temporarily bid down, but then readjust via capital flows and expansion of labour-intensive sectors. If wages are sticky, employment may fall in the short term. Initially, immigrants typically ‘cluster’ in entry-level occupations, so that low-skill UK-born workers (so-called ‘natives’) may experience short term wage losses and high-skill natives short-term gains (Dustmann et al., 2008).

Once externalities are allowed, the picture changes significantly. Immigration – and the diversity migrants bring – may lead to production complementarities for firms and workers (Ottaviano and Peri, 2005, Ottaviano and Peri, 2006, Bellini et al., 2008, Südekum et al., 2009, Longhi, 2011). For example, these may operate through more diverse workforces and diasporic communities (Saxenian, 2006, Page, 2007, Kerr and Lincoln, 2010). These channels will raise average labour productivity, not least by improving levels of innovation (see below). Larger urban populations also induce home market effects, raising demand for non-tradables. The combination of these channels may influence agglomeration economies, leading to further inward migration. However, greater competition for space in growing cities may raise the local cost of living (Saiz, 2003, Ottaviano and Peri, 2006). Over time, shifts in urban industrial structure and labour market institutions further influence economic outcomes. More cosmopolitan urban populations may also raise demand for new/hybridised goods and services, triggering Jacobian knowledge spillovers across sectors (Mazzolari and Neumark, 2009).

Conversely, employers in labour-intensive sectors may respond to long-term migrant inflows by permanently adjusting production functions to take advantage of cheap labour. Low value-added firms may then become reliant on migrant workers, locking out lower-skilled UK born workers from employment opportunities (Stenning et al., 2006). If these firms raise labour intensity and lower capital investment,

migration may contribute to 'low skills equilibrium' in some urban areas (Finegold and Soskice, 1988).

My first and second papers review this theory and relevant empirics in more detail. They suggest a number of evidence gaps remain, particularly in a UK context. First, there are still few studies that explore economic impacts of immigration beyond labour markets. Second, we know relatively little about the specific effects of urban *diversity*, over and above migrant populations. Third, the transmission mechanisms linking population shifts to urban economic outcomes are under-developed. The papers in this thesis are able to address all of these issues, and add to our knowledge of the UK experience.

4.2 Innovation, immigration and diversity

I develop these ideas further by focusing on a specific set of transmission mechanisms: the links between migrant and minority communities, diversity and innovation. I define innovation as 'the successful exploitation of new ideas'; a combination of invention, adoption and diffusion (Fagerberg, 2005, Department of Innovation Universities and Skills, 2008).

Conventional theories of innovation have relatively little to say to about immigration, ethnicity or the composition of inventor communities. Schumpeter (1962) focuses on the 'entrepreneurial function' inside and outside firms, and the role of individuals in identifying and commercialising new ideas, in the face of social inertia or resistance. National 'innovation systems' approaches explore relationships between firms and public institutions such as government agencies and universities (Freeman, 1987). Spatial approaches focus on clustering of innovative activity due to agglomeration-related externalities, particularly local knowledge spillovers (Jacobs, 1969, Jaffe et al., 1993, Audretsch and Feldman, 1996). More recently, a number of authors have explored the 'globalisation of innovation', as businesses in high-cost countries relocate research and development activity into lower-cost locations (Mowery, 2001, Archibugi and Iammarino, 2002, Cantwell, 2005, Yeung, 2009)

However, endogenous growth theories provide the basis for a number of newer studies linking demography to innovation, by highlighting the importance of

human capital stocks and knowledge spillovers to levels of innovation. In practice, access to knowledge is likely to be uneven across locations, business sectors and social groups (Agrawal et al., 2008). Migrants, co-ethnic groups and group diversity may all affect knowledge creation, access and flow. Recent work suggests four ways in which this could occur.

First, migrant status may induce positive selection of highly skilled or entrepreneurial individuals (Borjas, 1987). For example, both firms and wider research communities may benefit from the presence of migrant 'stars' (Stephan and Levin, 2001). Conversely, exclusion from mainstream economic institutions may force members of minority communities to develop new businesses, products and services (Kloosterman and Rath, 2001). The empirical challenge here is to distinguish migrant/minority status from other human capital endowments and wider structural conditions.

Second, social networks such as diasporic groups can accelerate ideas generation and (in particular) transmission (Docquier and Rapoport, 2011). Social networks offer their members higher social capital and levels of trust, lowering transaction costs and risk. In turn, networks seem to positively affect innovative activity (Rodríguez-Pose and Storper, 2006, Kaiser et al., 2011). As innovation systems globalise, co-ethnic networks such as diasporas may be an important channel for knowledge spillovers and ideas flow – improving awareness of new technologies and passing on tacit knowledge (Kapur and McHale, 2005, Saxenian and Sabel, 2008, Kerr, 2009). Firms employing diaspora members may thus benefit from these improved ideas flows, as well as a wider set of potential joint venture partners (Foley and Kerr, 2011). Conversely, other social networks – such as family or kinship networks, or professional associations – might turn out to be more important in determining knowledge spillovers (Agrawal et al., 2008). Discrimination against minority groups from other communities will limit knowledge spillovers.

Third, diversity may improve ideas generation, if a diverse set of economic agents has access to a larger set of ideas, perspectives and skills. Both Berliant and Fujita (2009) and Hong and Page (2001, 2004) model systems of group-level knowledge creation, showing that heterogeneity can accelerate ideas generation

through individual-level production complementarities. But, group-level cultural diversity may have a negative effect if it leads to lower trust and poor communication between individuals. Spillovers (and co-operation) will be limited, leading to fewer, lower-quality solutions (Alesina and La Ferrara, 2004). Fujita and Weber (2003) argue that positive diversity effects will be most likely observed in 'knowledge-intensive' activities and industries.

Finally, we might observe bigger co-ethnicity and diversity effects on innovative activity in cities because of composition effects: innovative activity, migrant and minority communities tend to be clustered in urban areas. Cities may also have positive or negative 'amplifying' effects. For example, if cultural diversity contributes to economic diversity, it may help foster knowledge spillovers across sectors at urban level (Jacobs, 1969). Conversely, members of minority communities may be physically isolated in particular urban neighbourhoods, limiting the opportunity for knowledge spillovers and interaction with other groups (Zenou, 2011).

This is another emerging research field in which there are a number of knowledge gaps: my third and fourth papers discuss theory and empirics in more detail. There are few studies exploring any one of the channels set out above, or comparing their relative impacts. A small number of studies explore the urban footprint of population-innovation effects, but data is often limited and results partial. Most importantly for my own research, there is virtually no empirical coverage of these issues in a British or wider European context. The papers in this thesis add to a small but growing global literature on immigration, diversity and innovation.

5. Questions and approach

My main research questions are:

- 1) What are the effects, if any, of ethnic / cultural diversity on the economic performance of UK cities?

- 2) What transmission mechanisms link diversity to economic outcomes?

3) What does this imply for policymakers?

My basic approach is built on economic geography concepts and frameworks. I am also making use of a wider range of research literatures and evidence bases, including: spatial/urban economics; labour economics; economic sociology; migration studies, diversity literature and cultural studies. The research draws predominantly on quantitative methods, particularly econometric analysis.

In order to identify migrant, ethnicity and diversity effects on innovation, I need to distinguish these from other individual, firm, industry, area and national trends and processes. I therefore pay careful attention to causality when designing research methods and identification strategies.

The thesis involves three phases of primary research, presented in papers. Phase 1 (linkages) tests potential connections between diversity and urban-level economic outcomes. Using Labour Force Survey and Land Registry microdata plus material from UK Electoral Registers, I construct cross-sections and panels of UK urban areas. Phase 2 (channels) explores how 'diversity effects' might be conferred. I focus on innovation channels, using patents microdata and the novel ONOMAP name classification system to explore effects of co-ethnic communities and diversity on inventor productivity. Phase 3 (experiences) examines the case of London in detail, exploring effects of cultural diversity and migrant entrepreneurs using a survey of firms in the capital. The papers are some of the first contributions to a growing European literature on diversity, innovation and urban economic performance.

6. The economics of 'super-diversity'

My first paper explores patterns of cultural diversity in British cities and their links to urban economic outcomes, focusing on the years 2001-2006 and the emergence of 'super-diversity' in some urban areas.

6.1 Context and contribution

The UK and many other Western societies have a long, sometimes hidden history of cultural diversity and multiculturalism (Sandu, 2004, Sassen, 2004). Over the past few decades, these societies have become dramatically more diverse, a process driven both by shifts in international migration and by natural change (Putnam, 2007). Vertovec (2006, 2007) argues that the resulting spread of new communities, languages, religious practices and people flows across the UK represents a shift from traditional patterns towards a new ‘super-diversity’, particularly in urban areas. As discussed in Section 4, there is now some suggestive evidence that cultural diversity may be an economic asset at the urban level (Ottaviano and Peri, 2005, Page, 2007). However, there has been little empirical research on the economics of super-diversity, especially in the UK.

The paper makes two main contributions to this growing literature. First, it assembles new data on patterns of cultural diversity in UK cities. Specifically, I use two ‘traditional’ metrics based on country of birth and official ethnic groups, plus new measurements derived using ONOMAP, a new and fine-grained system of cultural-ethnic-linguistic (CEL) name classification. This produces a very rich set of descriptive statistics covering recent experience in UK cities (see Appendix A for resulting typologies, and Appendix B for more on ONOMAP). Second, the paper tests linkages between cultural diversity measures, urban wages and employment rates, using cross-sectional analysis.

6.2 Data and estimation strategy

My three diversity measures draw on different sources. Labour Force Survey (LFS) microdata are used to construct metrics based on country of birth and official Office of National Statistics ethnic groups. The UK Electoral Register provides raw input for ONOMAP, which is provided as a pooled cross-section for 2001-6 on 67 ‘cultural -ethnic- linguistic’ groups.

Both datasets are supplied with local authority district-level identifiers. These are aggregated to 2001 Travel to Work Areas (TTWAs) using postcode weighting; following Gibbons et al (2011) I restrict the sample to ‘primary urban’ TTWAs to minimise the risk of sampling error (see Appendix C). I estimate a simple model

linking diversity to average wages and employment rates. I include controls covering demographic, social and economic characteristics, drawn from the LFS.

6.3 Results

Diversity is a complex concept, and the descriptive analysis confirms that different metrics capture different aspects of demographic change. Country of birth and ethnic group-based measures show the growth of new migrant and minority communities in the years since 2001. ONOMAP-based analysis highlights the long history of the multicultural city in the UK, as well as the complex regional, religious and linguistic patterns of urban population mix. All three measures shed light on the emergence of 'super-diversity', in contrast with the established late 20th century urban demographics.

Regression analysis suggests some positive links between super-diversity and both wages and employment at the urban level. However, the size and sign of the relationship crucially depends on the diversity measure used. Specifically, country of birth and ethnic group-based measures show strong positive links to urban wages, as do some CEL-based measures. Links to urban employment rates are more mixed, with only one CEL measure showing a positive relationship (the other shows a negative link).

These results are drawn from a small cross-section. As such, my findings have to be taken as suggestive, and coefficients as upper bounds. However, they are in line with a growing body of international evidence suggesting some economic benefits of cultural diversity, particularly in urban areas.

7. The long term impacts of migration in British cities

My second paper examines the long term economic impacts of migration on British cities, using a new 16-year panel. Since the early 1990s the UK has experienced 'the single biggest wave of immigration in British history' (Goodhart, 2010). Net migration

has been highly urbanised: has it affected the wages, employment rates and prices faced by UK-born workers?

7.1 Context and contribution

There is a large existing literature on the local economic impacts of migration, predominantly focused on labour market effects. As outlined above, most studies find little impact on average UK-born ('native') labour market outcomes (see Dustmann et al (2008) for a recent review). However, few authors examine broader effects of migration on the spatial economy, as more diverse communities emerge. This paper helps fill the gaps, adapting the pioneering US work of Ottaviano and Peri (Ottaviano and Peri, 2005, Ottaviano and Peri, 2006) for a British context.

Wider urban impacts of migration may be productivity-enhancing, if migrants facilitate knowledge spillovers or reduce trade costs (Saxenian, 2006, Berliant and Fujita, 2009). Net migration may then lead to higher native productivity, wages and employment rates: crowding raises the local cost of living. Alternatively, parts of the local economy may become 'migrant-dependent' (Stenning et al., 2006). Net migration damages native employment if lower-skilled natives cannot move into better jobs. If this sustains a low-skills equilibrium (Finegold and Soskice, 1988), wages and prices also fall over time.

7.2 Data and estimation strategy

The analysis follows the spatial correlations approach (Altonji and Card, 1991) but has several novel features. These allow me to improve on existing UK studies (Frattini, 2008, Lee, 2010, Longhi, 2011) with a longer sample period, better-defined spatial units, and richer data. Specifically, I assemble a new 16-year panel of urban economies between 1994 and 2008, using postcode weighting to aggregate microdata from the UK Labour Force Survey, Land Registry and other sources. I use 2001 Travel to Work Areas to approximate local labour markets, focusing on 79 'primary urban' areas (see Appendix C). To measure the size and diversity of migrant populations, I use both migrant population shares and an inverse Herfindahl Index of country of birth groups.

I estimate a parsimonious two-period model with time dummies and area fixed effects, linking net migration to changes in UK-born average wages, employment rates and house prices. I am able to explore detailed interactions between different skill groups of migrants and natives. The model also allows me to infer the effects of migrant-related changes in urban labour productivity, since over time, productivity changes are reflected in shifting nominal wage rates (Combes et al., 2005). Finally, I run several robustness checks – including tests for native outflows and for positive migrant selection (Borjas, 1994). The latter test uses a shift-share instrument based on historic migrant settlement patterns.

7.3 Results

The results suggest important impacts of net migration on urban economies, within and beyond the labour market. Specifically, the diversity migrants bring helps drive up high-skill native productivity and wages, implying both production complementarities and relative scarcity effects. Conversely, increasingly migrant-intensive labour markets appear to ‘lock out’ some intermediate and low-skilled British-born workers from employment opportunities, particularly since 2000. ‘Migrants taking British jobs’ is an oversimplification, however: on-going impacts of long-term industrial decline and the increasing casualisation of entry-level jobs partly explain the employment findings.

8. Ethnic inventors and innovation in the UK

The next phase of my research focuses on transmission channels, in particular links between demographic change and innovation. My third paper looks at ‘ethnic inventors’, building on growing academic and policy interest in links between immigration and innovation (Legrain, 2006, Page, 2007, Leadbeater, 2008, Kerr and Kerr, 2011). Interest in ethnic inventor communities is largely based on the experience of high-tech US regions like Silicon Valley (Saxenian, 2006). Little is known about how ethnic inventors might shape innovative activity in the UK. The paper explores recent British experience, using a new panel of patents microdata.

8.1 Context and contribution

As suggested in Section 4, demographic shifts might affect innovation in four broad ways. First, migration or minority status may induce positive selection of skilled or entrepreneurial individuals, although this needs to be distinguished from other human capital endowments (Borjas, 1987, Stephan and Levin, 2001, Hunt and Gauthier-Loiselle, 2008). Second, co-ethnic diasporic groups can accelerate ideas generation and transmission, although discrimination may constrain knowledge spillovers (Kloosterman and Rath, 2001, Docquier and Rapoport, 2011). Third, cultural diversity may improve ideas generation, if the benefits of a larger set of ideas, perspectives outweigh trust or communication difficulties (Alesina and La Ferrara, 2004, Berliant and Fujita, 2009). Finally, urban areas may have positive influences via ‘demand push’ from cosmopolitan populations, or negative influences if immigrant communities are spatially segregated (Gordon et al., 2007).

This paper looks at the role of ethnic inventors in innovation in the UK, using a new 12-year panel of patents microdata. Using the novel ONOMAP name classification system to build on pioneering US work by Agrawal et al (2008) and Kerr (2008) I am able to explore all four ‘population-innovation’ channels (Appendices A and B give more detail on ONOMAP). As far as I am aware, it is the first paper of its kind in the UK or Europe.

8.2 Data and estimation strategy

I construct a panel of inventor activity 1993-2004, using European Patent Office microdata cleaned by the KITES team at Bocconi University. I then apply the ONOMAP name-scoring system to inventor surname-forename combinations. Together, these enable me to identify individual migrant inventors and co-ethnic groups, and to build measures of inventor group diversity.

I estimate a simplified knowledge production function linking counts of inventor patenting activity – ‘inventor productivity’ – to individual, group and Travel to Work Area-level area characteristics. Controls are taken from Labour Force Survey

microdata, aggregated using postcode weights. Using techniques popularised by Blundell et al (1995), I exploit historic patent information to fit inventor-level fixed effects. I also run a series of robustness checks, testing for dynamic feedback effects within the panel, the influence of area-level demographic characteristics on inventor composition, the role of historic patent stocks, and distributional impacts of ethnic inventors on 'majority' groups.

8.3 Results

I fit the model as a negative binomial and in OLS, with similar results. Ethnic inventor status has no effect on inventor productivity once human capital is controlled for. However, membership of some co-ethnic groups has a positive effect – specifically South Asian and Southern European communities. I also find small but robust positive effects of inventor group diversity on individual patenting counts. Distributional impacts are less clear – I find some individual-level evidence that majority inventors are crowded out, but not at area level.

In contrast to theory, I do not find that urban location or density has a significant effect on individual patenting counts once other area-level factors are taken into account. The results survive a range of robustness tests, although alternative measures of area-level human capital weaken diversity effects.

Overall, ethnic inventors are a net positive for patenting in the UK, although the British experience is significantly different from the US. This is likely to reflect distinctive patterns of US and UK migrant settlement – in particular skill-biased migration of engineers and scientists to the US – as well as culturally distinctive US attitudes to entrepreneurship. This is an emerging field of research, and further studies could explore alternative measures of innovative activity, more precise identification of migrant / ethnic inventors, sectoral and area differences, distributional impacts and other ethnicity/diversity transmission channels.

9. Does cultural diversity help firms to innovate?

The third phase of research looks in detail at the experience of London. My fourth paper, written with Neil Lee, examines cultural diversity and innovation in 7,600 London businesses. The UK capital is one of the world's most diverse – in terms of country of birth, language and ethnicity (Burdett and Sudjic, 2011). London's diversity is seen as a social asset. This paper asks: does it help London firms to innovate?

9.1 Context and contribution

In theory, diversity's effect on innovation is ambiguous. Diverse organisations may have higher communication costs and lower trust (Alesina and La Ferrara, 2004); however, diverse teams may be better at generating new ideas or problem solving (Page, 2007, Berliant and Fujita, 2009). Through diasporic networks, firms can access additional markets, assisting process innovation and the commercialisation of new ideas (Saxenian and Sabel, 2008, Docquier and Rapoport, 2011). But diverse firms may also face discrimination in the marketplace, especially in taking new products / processes to market.

Empirical evidence suggests that individual migrant entrepreneurs play critical roles within and around firms, developing new ideas and linking companies in different countries (Kapur and McHale, 2005, Saxenian, 2006, Wadhwa et al., 2007). Diverse cities may amplify these processes (Berliant and Fujita, 2009). Minority populations concentrate in cities (Champion, 2006); large, diverse urban markets encourage the emergence of new products (Mazzolari and Neumark, 2009).

We make several contributions to this growing field. We believe this is the first study to use a large sample of real-world firms in an urban context, and allows examination of multiple diversity-innovation channels. And as far as we know, our results are original for the UK.

9.2 Data and estimation strategy

We use data from the London Annual Business Survey (LABS), constructing a repeat cross-section of over 7,600 firms from 2005-2007. Exploiting LABS' unique

structure, we develop multiple measures for both innovation and its commercialisation, and a series of diversity variables covering the birth country and ethnicity mix of business owners/partners. We also identify migrant-run and ‘UK-run’ firms.

We deploy a simplified knowledge production function linking firms’ innovative activity to ownership characteristics, estimating the model as a conditional logit with a range of controls, sector and year dummies. We extend the model to look at links between firms’ owner/partner composition and market orientation, and examine the extent of migrant entrepreneurship using a subset of company founders. We also examine innovative activity across ‘knowledge-intensive’ and less knowledge-intensive firms in the city, which allows us to explore patterns of high-value and ‘ordinary’ innovations.

We adopt various checks to try and identify causality. We use the natural experiment of A8 accession in 2004 to minimise city-level demand-pull factors. To control for firm-level positive selection, we fit a shift-share instrument based on historic migrant settlement patterns within London neighbourhoods.

9.3 Results

Our results suggest small but robust positive effects of diverse top teams and migrant-run firms on the development of new products and processes. In contrast to the wider literature, we find diversity-innovation effects across London’s industrial structure – particularly in less knowledge-intensive sectors. This suggests the ‘diversity bonus’ is particularly important for ‘ordinary’ innovations. London’s large and diverse home markets, diasporic communities and international connectivity play important roles, as do entrepreneurial migrant business owners.

Overall, the results support claims that London’s cultural diversity helps support innovative activity, strengthening the capital’s long-term economic position. Our findings for the UK capital contrast with findings from the author’s earlier papers, which suggest rather weaker effects of diversity on urban level productivity.

Intuitively, our results might be replicated in other UK conurbations where urban scale effects are similar. Parallel research would be fruitful.

10. Conclusions

Britain and other Western societies are becoming more culturally diverse, with immigration, shifting patterns of settlement and natural change all important drivers. The UK's cultural diversity is largely urbanised, reflecting both historical patterns and the economic pull of large cities. My research explores the economics of cultural diversity – in particular, links to innovative activity and to urban economic performance. Despite high levels of interest, there is surprisingly little research on these issues, especially in a British context, and many of the papers are UK 'firsts'.

The first phase of research explores connections between diversity, immigration and urban economic performance. While cross-sectional analysis finds positive associations, panel data analysis reveals a more complex story. I find that net immigration helps raise native productivity, especially for high-skilled workers, but may help exclude lower-skill natives from employment opportunities. De-industrialisation and casualisation of entry-level occupations partly explain the employment results. Phase two investigates how 'diversity effects' might be conferred, in particular links to innovation. Analysis of patents microdata suggests that in some cases, co-ethnic group membership raises inventor productivity, as does the overall diversity of inventor groups. Exploring impacts on majority patenting, I find some evidence of individual-level 'crowd-out' but no effects of displacement at area level. I explore diversity-innovation links further in phase three, a case study of London firms. I find positive effects of diverse managements on ideas generation. Diverse firms are also more likely than homogenous firms to sell into London's large, cosmopolitan home markets – and into international markets. Migrant entrepreneurship helps explain our main result. London's megacity status is also likely to influence the findings, and parallel research is required in other large UK cities.

The research has been conducted against the backdrop of intense public and policy conversations. Over the past decade and a half, race and immigration have consistently scored among the issues of greatest concern to the UK public. On immigration, policymakers have had to reconcile a largely anti-immigration public and strong pro-immigration business voices. On diversity, the 1980s model of multiculturalism has faced widespread criticism post-9/11 and policy has shifted, placing greater emphasis on 'integration' and maintaining community cohesion. Policymakers in both areas would benefit from a better understanding of the *economic* effects of larger, more diverse communities and cities.

Overall, my findings contrast with popular narratives that net immigration and diversity are straightforwardly 'good' or 'bad' for the UK. They show positive effects on productivity, wages and innovation, although these tend to be small. Significantly, EU and non-EU groups both appear to influence levels of innovative activity. Distributional analysis is more complex, with high skill workers and firms the winners, and some evidence that low-skill native workers can lose out. The UK's 'diversity experience' is distinctive, reflecting historical factors and policy choices.

The results suggest that the right policy mix can help British cities and citizens achieve greater economic benefit from bigger and more diverse communities. An 'economics of diversity' strategy would consist of two main elements. The first element would exploit the connections between high-skill immigration, diversity, innovation and productivity. Policymakers need an unambiguous policy of encouraging high-skill migrants from around the world. This would imply a move away from the current migration cap, and allowing universities to compete more easily for international students. At the same time, policymakers should take active steps to help build diasporic communities in the UK, for example by facilitating return migration and remittance flows, and promoting greater trade flows with producers in key 'home' countries.

The second element of the strategy would mitigate negative effects, in particular the labour market lock-out that seems to be affecting some lower-skilled UK-born workers. This would require a re-regulation of entry-level occupations in 'migrant-intensive' sectors such as food processing, with stronger enforcement of

minimum wage and working conditions legislation and a restriction of some of the activities of temporary recruitment agencies. This strategy also requires that we raise the skills and employability of low-skill Britons, through more effective welfare to work and in-work support programmes. In some areas, these supply-side interventions could be combined with economic development policies to raise the quality of employer business models; by encouraging firms to move into higher-value production, these might help lift areas out of low-skills equilibrium. Together, these interventions could help the UK make the most of its growing diversity.

References

- ACKROYD, P. 2000. *London: The Biography*, London, Vintage.
- AGRAWAL, A., KAPUR, D. & MCHALE, J. 2008. How do spatial and social proximity influence knowledge flows? Evidence from patent data. *Journal of Urban Economics*, 64, 258-269.
- ALESINA, A. & LA FERRARA, E. 2004. Ethnic Diversity and Economic Performance. *NBER Working Paper 10313*. Cambridge, MA: NBER.
- ALONSO, W. 1964. *Location and Land Use*, Cambridge, MA, Harvard University Press.
- ALTONJI, J. & CARD, D. 1991. The Effects of Immigration on the Labor Market Outcomes of Less-skilled Natives. In: ABOWD, J. & FREEMAN, R. (eds.) *Immigration, Trade and the Labor Market*. Chicago: University of Chicago Press.
- AMIN, A. 2002. Ethnicity and the Multicultural City: Living with Diversity. *Environment and Planning*, 34, 959-980.
- ARCHIBUGI, D. & IAMMARINO, S. 2002. The globalization of technological innovation: definition and evidence. *Review of International Political Economy*, 9, 98-122.
- ASPINALL, P. 2009. The Future of Ethnicity Classifications. *Journal of Ethnic and Migration Studies*, 35, 1417-1435.
- AUDRETSCH, D. & FELDMAN, M. 1996. R&D Spillovers and the Geography of Innovation and Production. *American Economic Review*, 86, 630-640.
- BASSERE, V., DENSHAM, P., MILLAR, J. & SALT, J. 2007. Migrants from Central and Eastern Europe: New Geographies. *Population Trends*, 129, 7-19.
- BBC. 2010. *Business cheers exclusions from migration cap* [Online]. London: BBC. Available: <http://www.bbc.co.uk/news/business-11824383> [Accessed 23 August 2011].
- BELLINI, E., OTTAVIANO, G., PINELLI, D. & PRAROLO, G. 2008. Cultural Diversity and Economic Performance: Evidence from European Regions. *HWWI Research Paper 3-14*. Hamburg: Hamburg Institute of International Economics.
- BERLIANT, M. & FUJITA, M. 2009. The Dynamics of Knowledge Diversity and Economic Growth. *56th Annual North American Meeting, Regional Science Association International*. San Francisco.
- BLINDER, S. 2011. UK Public Opinion toward Immigration: Overall Attitudes and Level of Concern. *Migration Observatory Briefing*. Oxford: COMPAS.
- BLUNDELL, R., GRIFFITH, R. & VAN REENEN, J. 1995. Dynamic Count Data Models of Technological Innovation. *The Economic Journal*, 105, 333-344.
- BORJAS, G. 1987. Self-Selection and the Earnings of Immigrants. *American Economic Review*, 77, 531-53.
- BORJAS, G. 1994. The Economics of Immigration. *Journal of Economic Literature*, 32, 1667-1717.

- BURDETT, R. & SUDJIC, D. 2011. *Living in the Endless City*, London, Phaidon.
- CALDWELL, C. 2009. *Reflections on the Revolution in Europe: Immigration, Islam and the West* London, Allen Lane.
- CANTWELL, J. 2005. MNCs, local clustering and science-technology relationships. *In: SANTANGELO, G. (ed.) Technological Change and Economic Catch-Up: The Role of Science and Multinationals*. Cheltenham: Edward Elgar.
- CHAMPION, T. 2006. State of the English Cities: The Changing Urban Scene: Demographics and the Big Picture. London: Office of the Deputy Prime Minister.
- CHAMPION, T. & FISHER, T. 2004. Migration, Residential Preferences and the Changing Environment of Cities. *In: BODDY, M. & PARKINSON, M. (eds.) City Matters*. Bristol: Policy Press.
- COLLIER, P. & HOEFFLER, A. 1998. On economic causes of civil war. *Oxford Economic Papers*, 50, 563-573.
- COMBES, P.-P., DURANTON, G. & OVERMAN, H. 2005. Agglomeration and the Adjustment of the Spatial Economy. *Papers in Regional Science*, 84, 311-349.
- CRAFTS, N. & VENABLES, A. Globalisation in History: A Geographical Perspective. NBER Conference, 2001 London. LSE, 1-51.
- DEPARTMENT OF INNOVATION UNIVERSITIES AND SKILLS 2008. Innovation Nation. London: Department of Innovation, Universities and Skills.
- DOCQUIER, F. & RAPOPORT, H. 2011. Globalisation, Brain Drain and Development. *IZA DP 5590*. Bonn: IZA.
- DURANTON, G. & PUGA, D. 2001. Nursery Cities: Urban Diversity, Process Innovation and the Life Cycle of Products. *American Economic Review* 91, 1454-1477.
- DUSTMANN, C., GLITZ, A. & FRATTINI, T. 2008. The labour market impact of immigration. *Oxford Review of Economic Policy*, 24, 477-494.
- FAGERBERG, J. 2005. Innovation: A guide to the literature. *In: FAGERBERG, J., MOWERY, D. & NELSON, R. (eds.) The Oxford Handbook of Innovation*. Oxford: OUP.
- FANSHAWE, S. & SRISKANDARAJAH, D. 2010. You Can't Put Me In a Box: Super-diversity and the end of identity politics in Britain. London: ippr.
- FERNANDEZ, R. 2010. Does Culture Matter? *NBER Working Paper 16277*. Cambridge, Mass: NBER.
- FINEGOLD, D. & SOSKICE, D. 1988. The Failure of Training in Britain: Analysis and Prescription. *Oxford Review of Economic Policy*, 4, 21-53.
- FLORIDA, R. 2002. *The Rise of the Creative Class*, New York, Basic Books.
- FLORIDA, R. 2005. The world is spiky. *The Atlantic Monthly*, 296, 48-51.
- FOLEY, C. F. & KERR, W. R. 2011. Ethnic Innovation and U.S. Multinational Firm Activity. *National Bureau of Economic Research Working Paper Series*, No. 17336.
- FRATTINI, T. 2008. Immigration and Prices in the UK. *mimeo*. London: UCL.

- FREEMAN, C. 1987. *Technology Policy and Economic Policy: Lessons from Japan* London, Pinter.
- FUJITA, M., KRUGMAN, P. & VENABLES, A. J. 1999. *The Spatial Economy: Cities, Regions, and International Trade*, Cambridge, MA, MIT Press.
- FUJITA, M. & WEBER, S. 2003. Strategic Immigration Policies and Welfare in Heterogenous Countries. *Institute of Economic Research Working Papers*. Kyoto: Kyoto University.
- GIBBONS, S., OVERMAN, H. & RESENDE, G. 2011. Real Earnings Disparities in Britain. *SERC Discussion Paper SERCDP0065*. London: LSE.
- GILROY, P. 1993. *Black Atlantic: Modernity and Double Consciousness*, London, Verso.
- GLAESER, E. 2005. Review of Richard Florida's 'The Rise of the Creative Class'. *Regional Science and Urban Economics*, 35, 593-596.
- GLAESER, E. 2008. *Cities, Agglomeration and Spatial Equilibrium*, Oxford, OUP.
- GOODHART, D. 2004. Too Diverse? *Prospect*, 95.
- GOODHART, D. 2010. A Crowded Island. *Prospect*, 168.
- GORDON, I., WHITEHEAD, C. & TRAVERS, T. 2007. The Impact of Recent Immigration on the London Economy. London: City of London Corporation.
- GORODNICHENKO, Y. & ROLAND, G. 2011. Which Dimensions of Culture Matter for Long-Run Growth? *American Economic Review*, 101, 492-98.
- GRAHAM, D. 2007. Identifying Urbanisation and Localisation Externalities in Manufacturing and Service industries. *Papers in Regional Science*, 88, 63-84.
- GREEN, A. 2007a. Overview: Migration, Skills and Employment. *Migration, Skills and Employment*. London.
- GREEN, A. 2008. Labour Market Intermediaries, Employment of Economic Migrants and Challenges for Regional Development. *AAG 2008 Annual Conference*. Boston, Mass.
- GREEN, A., DE HOYOS, M., JONES, P. & OWEN, D. 2009. Rural development and labour supply challenges in the UK: the role of non-UK migrants. *Regional Studies*, 43, 1261 - 1273.
- GREEN, A., JONES, P. & OWEN, D. 2007a. Migrant Workers in the East Midlands Labour Market. Warwick: Institute for Employment Research.
- GREEN, A., OWEN, D. & JONES, P. 2007b. The Economic Impact of Migrant Workers in the West Midlands. Birmingham: Learning and Skills Council West Midlands Region.
- GREEN, A. E. 2007b. Local action on labour market integration of new arrivals: Issues and dilemmas for policy. *Local Economy*, 22, 349-361.
- HALL, P. 1998. *Cities in Civilisation: Culture, Innovation and Urban Order*, London, Weidenfeld and Nicholson.
- HENDERSON, J. V. 1974. The sizes and types of cities. *American Economic Review*, 64, 640-656.

- HONG, L. & PAGE, S. 2001. Problem Solving by Heterogeneous Agents. *Journal of Economic Theory*, 97, 123-163.
- HONG, L. & PAGE, S. 2004. Groups of diverse problem solvers can outperform groups of high-ability problem solvers. *Proceedings of the National Academy of Sciences of the United States of America*, 101, 16385-16389.
- HUNT, J. & GAUTHIER-LOISELLE, M. 2008. How much Does Immigration Boost Innovation? *NBER Working Paper 14312*. Cambridge, Mass.: NBER.
- JACOBS, J. 1961. *The Life and Death of Great American Cities*, London, Pimlico.
- JACOBS, J. 1969. *The Economy of Cities*, London, Vintage.
- JAFFE, A. B., TRAJTENBERG, M. & HENDERSON, R. 1993. Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations. *The Quarterly Journal of Economics*, 108, 577-598.
- KAISER, U., KONGSTED, H. C. & RØNDE, T. 2011. Labor Mobility, Social Network Effects, and Innovative Activity. *In: 5654*, I. D. N. (ed.). Bonn: IZA.
- KAPUR, D. & MCHALE, J. 2005. Sojourns and Software: Internationally mobile human capital and high tech industry development in India, Ireland and Israel. *In: ARORA, A. & GAMBARDELLA, A. (eds.) From Underdogs to Tigers: The Rise and Growth of the Software Industry in Brazil, China, India, Ireland and Israel*. Oxford: OUP.
- KEITH, M. 2005. *After the Cosmopolitan? Multicultural cities and the future of racism*, Abingdon, Routledge
- KERR, S. P. & KERR, W. 2011. Economic Impacts of Immigration: A Survey *NBER Working Paper 16736*. Cambridge, MA: NBER
- KERR, W. 2008. The Agglomeration of US Ethnic Inventors. *HBS Working Paper 09-003*. Boston, MA: Harvard Business School.
- KERR, W. 2009. Breakthrough Innovations and Migrating Clusters of Innovation. *NBER Working Paper 15443*. Cambridge, MA: NBER.
- KERR, W. & LINCOLN, W. 2010. The Supply Side of Innovation: H-1b Visa Reforms and US Ethnic Invention *NBER Working Paper 15768*. Cambridge, Mass.: NBER
- KLOOSTERMAN, R. & RATH, J. 2001. Immigrant entrepreneurs in advanced economies: mixed embeddedness further explored. *Journal of Ethnic and Migration Studies*, 27, 189-202.
- KRUGMAN, P. 1991. *Geography and Trade*, Cambridge, MA, MIT Press.
- KRUGMAN, P. & OBSFELDT, M. 2003. *International Economics: Theory and Policy*, Boston, Addison Wesley.
- KRUGMAN, P. & VENABLES, A. 1995. Globalization and the inequality of nations. *Quarterly Journal of Economics*, 110, 857-880.
- LANDRY, C. & WOOD, P. 2008. *The Intercultural City: Planning for Diversity Advantage*, London, Earthscan.
- LEADBEATER, C. 2008. The Difference Dividend: Why Immigration is Vital to Innovation. *NESTA Provocation*. London: NESTA.

- LEE, N. 2010. Ethnic Diversity and Employment Growth in English Cities. *Urban Studies*.
- LEGRAIN, P. 2006. *Immigrants: Your Country Needs Them*, London, Little, Brown.
- LONDON FIRST 2008. *The World in One City*.
- LONGHI, S. 2011. Impact of Cultural Diversity on Wages and Job Satisfaction in England. *NORFACE MIGRATION Discussion Paper No. 2011-10*. NORFACE
- LUCAS, R. 1988. On the Mechanics of Economic Growth. *Journal of Monetary Economics*, 22, 3-42.
- MARSHALL, A. 1918. *Principles of Economics*, New York, Macmillan.
- MASSEY, D. 1984. *Spatial Divisions of Labour: Social Structures and the Geography of Production*, New York, Methuen.
- MATEOS, P. 2007. A review of name-based ethnicity classification methods and their potential in population studies. *Population, Space and Place* 13, 243-263.
- MAZZOLARI, F. & NEUMARK, D. 2009. Beyond Wages: The effects of immigration on the scale and composition of output. *NBER Working Papers 14900*. Cambridge, MA: NBER.
- MCCANN, P. 2008. Globalisation and Economic Geography: The World is Curved, not Flat. *Cambridge Journal of Regions, Economy and Science*, 1, 351-370.
- MCSMITH, A. & RUSSELL, B. 2007. Migrants are essential for business growth, says CBI. *The Independent*, 3 January.
- MELO, P., GRAHAM, D. & NOLAND, R. 2009. A meta-analysis of estimates of urban agglomeration economies. *Regional Science and Urban Economics*, 39, 332-342.
- MILLS, E. S. 1967. An Aggregative Model of Resource Allocation in a Metropolitan Area. *The American Economic Review*, 57, 197-210.
- MOWERY, D. C. 2001. Technological Innovation in a Multipolar System: Analysis and Implications for U.S. Policy. *Technological Forecasting and Social Change*, 67, 143-157.
- MUDAMBI, R. 2008. Location, control and innovation in knowledge-intensive industries. *Journal of Economic Geography*, 8, 699-725.
- NATHAN, M. 2007. The Wrong Stuff? Creative Class Theory and Economic Performance in UK Cities. *Canadian Journal of Regional Science*, XXX, 433-450.
- OFFICE OF NATIONAL STATISTICS 2003. *Ethnic Group Statistics: A guide for the collection and classification of ethnicity data*. Newport: ONS.
- OFFICE OF NATIONAL STATISTICS 2011. *Population Estimates by Ethnic Group 2002-2009*. *ONS Statistical Bulletin*. London: ONS.
- OTTAVIANO, G., BELLINI, E. & MAGLIETTA, A. 2007. Diversity and the Creative Capacity of Cities and Regions. *SUSDIV Paper 2.2007*. Bologna: FEEM.
- OTTAVIANO, G. & PERI, G. 2005. Cities and Cultures. *Journal of Urban Economics*, 58, 304-337.

- OTTAVIANO, G. & PERI, G. 2006. The Economic Value of Cultural Diversity: Evidence from US Cities. *Journal of Economic Geography*, 6, 9-44.
- OTTAVIANO, G. & PERI, G. 2007. The Effects of Immigration on US Wages and Rents: A General Equilibrium Approach. *CrEAM Discussion Paper 13/07*. London: UCL.
- OVERMAN, H. & RICE, P. 2008. Resurgent Cities and Regional Economic Performance. *SERC Policy Paper 1*. London: London School of Economics.
- PAGE, S. 2007. *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools and Societies*, Princeton, Princeton University Press.
- PEET, R. 1998. *Modern Geographical Thought*, Oxford, Blackwell.
- PERFORMANCE AND INNOVATION UNIT 2003. Ethnic Minorities in the Labour Market London: Cabinet Office Performance and Innovation Unit.
- PUTNAM, R. 2007. E Pluribus Unum: Diversity and Community in the Twenty-First Century. *Scandinavian Political Studies*, 30, 137-174.
- RANIS, G. 2009. Diversity of Communities and Economic Development: An Overview. *Economics Department Working Paper 69*. Yale: Economic Growth Center, Yale University.
- RODRÍGUEZ-POSE, A. & STORPER, M. 2006. Better Rules or Stronger Communities? On the social foundations of institutional change and its economic effects. *Economic Geography*, 82, 1-25.
- ROMER, P. 1990. Endogenous Technological Change. *Journal of Political Economy*, 98, 71-102.
- SAIZ, A. 2003. Room in the Kitchen for the Melting Pot: Immigration and Rental Prices. *Review of Economics and Statistics*, 85, 502-521.
- SANDERCOCK, L. 2003. *Cosmopolis II: Mongrel cities in the 21st century*, London, Continuum
- SANDU, S. 2004. *London Calling: How Black and Asian Writers Imagined a City*, London, Harper Perennial.
- SANTE, L. 1998. *Low Life: Drinking, Drugging, Whoring, Murder, Corruption, Vice and Miscellaneous Mayhem in Old New York*, London, Granta Books.
- SASSEN, S. 2004. Europe and its Migrations: The Long View. In: BECHLER, R. (ed.) *Identities on the Move* London: British Council.
- SAXENIAN, A.-L. 2006. *The New Argonauts: Regional Advantage in a Global Economy*, Cambridge, MA, Harvard University Press.
- SAXENIAN, A.-L. & SABEL, C. 2008. Venture Capital in the 'Periphery': The New Argonauts, Global Search and Local Institution-Building. *Economic Geography*, 84, 379-394.
- SCHUMPETER, J. 1962. *The Theory of Economic Development*, Berlin, Springer.
- SIMPSON, L. & FINNEY, N. 2009. *Sleepwalking to Segregation? Challenging myths about race and migration*, Bristol, Policy Press.
- SMITH, M. P. 2001. *Transnational Urbanism: Locating globalisation* Oxford, Blackwell.

- SOMERVILLE, W. 2007. *Immigration under New Labour*, Bristol, Policy Press.
- SPOLAORE, E. & WACZIARG, R. 2009. The Diffusion of Development. *Quarterly Journal of Economics*, 124, 469-529.
- STENNING, A., CHAMPION, T., C, C., COOMBES, M., DAWLEY, S., DIXON, L., RAYBOULD, S. & RICHARDSON, R. 2006. Assessing the Local and Regional Impacts of International Migration. *New Horizons Report to DCLG*. Newcastle: CURDS.
- STEPHAN, P. & LEVIN, S. 2001. Exceptional Contributions to US Science by the foreign-born and foreign-educated. *Population Research and Policy Review*, 20, 59-79.
- STORPER, M. 1997. *The Regional World: Territorial Development in a Global Economy*, New York, Guilford.
- SÜDEKUM, J., WOLF, K. & BLIEN, U. 2009. Cultural Diversity and Local Labour Markets. Monograph. Duisberg: University of Duisberg-Essen.
- URRY, J. 2000. *Sociology Beyond Societies: Mobilities for the Twenty-First Century*, London, Routledge.
- VELTZ, P. 2000. European cities in the world economy. In: BAGNASCO, A. & LE GALÈS, P. (eds.) *Cities in Contemporary Europe*. Cambridge: Cambridge University Press.
- VENABLES, A. 2006. Shifts in Economic Geography and Their Causes. *CEP Discussion Paper 767*. London: LSE.
- VERTOVEC, S. 2006. The Emergence of Super-Diversity in Britain. *COMPAS Working Paper WP-06-25*. Oxford: Oxford University Centre on Migration, Policy and Society.
- VERTOVEC, S. 2007. Super-diversity and its implications. *Ethnic and Racial Studies*, 30, 1024-1054.
- WADHWA, V., SAXENIAN, A.-L., RISSING, B. & GEREFFI, G. 2007. America's New Immigrant Entrepreneurs. Durham, NC: Duke University / iSchool, UC Berkeley.
- WOHLAND, P., REES, P., NORMAN P, BODEN P & JASINSKA M 2010. Ethnic Population Projections for the UK and Local Areas, 2001-2051. *Working Paper 10/2*. Leeds: School of Geography, University of Leeds.
- WOLF, M. 2008. Four Falsehoods on UK Immigration. *Financial Times*, 3 April.
- YEUNG, H. 2009. Regional Development and the Competitive Dynamics of Global Production Networks: An East Asian Perspective. *Regional Studies*, 43, 325-351.
- ZENOU, Y. 2011. Spatial versus Social Mismatch: The Strength of Weak Ties. *IZA Discussion Papers 5507*. Bonn: Institute for the Study of Labor (IZA).