

Max Nathan, [Neil Lee](#)

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Cultural Diversity, Innovation, and Entrepreneurship: Firm-level Evidence from London

Max Nathan

London School of
Economics and Spatial
Economics Research
Centre
Houghton Street
London, WC2A 2AE
United Kingdom
m.a.nathan@lse.ac.uk

Neil Lee

Department of Economics
University of Lancaster
Lancaster, LA1 4YW
United Kingdom
n.lee1@lancs.ac.uk

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abstract

A growing body of research is making links between diversity and the economic performance of cities and regions. Most of the underlying mechanisms take place within firms, but only a handful of organization-level studies have been conducted. We contribute to this underexplored literature by using a unique sample of 7,600 firms to investigate links among cultural diversity, innovation, entrepreneurship, and sales strategies in London businesses between 2005 and 2007. London is one of the world's major cities, with a rich cultural diversity that is widely seen as a social and economic asset. Our data allowed us to distinguish owner/partner and wider workforce characteristics, identify migrant/minority-headed firms, and differentiate firms along multiple dimensions. The results, which are robust to most challenges, suggest a small but significant "diversity bonus" for all types of London firms. First, companies with diverse management are more likely to introduce new product innovations than are those with homogeneous "top teams." Second, diversity is particularly important for reaching international markets and serving London's cosmopolitan population. Third, migrant status has positive links to entrepreneurship. Overall, the results provide some support for claims that diversity is an economic asset, as well as a social benefit.

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In recent decades, the United Kingdom and other Western societies have become dramatically more culturally diverse, whether measured by net immigration or the presence of minority ethnic communities (Putnam 2007). Policymakers and researchers are now starting to explore the economic effects of this growing diversity, especially in urban areas. This article explores links between cultural diversity and business performance in London using rich quantitative data and focusing on three aspects of business performance.

The economic diversity of cities has long been seen as enabling long-term development (Jacobs 1969). A growing body of urban-level evidence suggests that *cultural* diversity may also help cities' economic growth—for example, through production complementarities, an improved diffusion of knowledge, better access to international markets, or higher rates of entrepreneurship (Lee 2011; Nathan 2011; Hunt and Gauthier-Loiselle 2010; Ozgen, Nijkamp, and Poot 2010; Kerr 2009; Bellini, Ottaviano, Pinelli, and Prarolo 2008; Peri 2007; Ottaviano and Peri 2006; Niebuhr 2006; Ottaviano and Peri 2005).

In principle, these mechanisms should largely operate at the level of firms. But economic theory suggests that the effects of diversity on business performance are ambiguous. First, culturally diverse leadership teams may be better at generating new ideas or solving problems, particularly in knowledge-intensive environments (Page 2007; Fujita and Weber 2003). But diverse organizations may face higher communication costs and lower trust, hindering innovation (Alesina and La Ferrara 2004). Second, through diasporic networks, migrant or minority business owners can access additional upstream and downstream markets, either internationally or in local neighborhoods (Saxenian 2006; Zhou and Tseng 2001); however, discrimination or segregation may constrain their actions (Phillips 1998). Third, migrant status may preselect entrepreneurial individuals (Wadhwa, Saxenian, Rissing, and Gereffi 2007). Conversely, minority communities may be excluded from mainstream economic opportunities, so that ethnic entrepreneurship is a second-best outcome (Gordon, Whitehead, and Travers 2007). Such “ethnic entrepreneurs” may also contribute to innovation and help link firms in different countries (Saxenian and Sabel 2008).

Assessing the extent to which these channels operate is an important issue for both academic

research and governmental policy. However, most research to date has been conducted at the area level, with a relative dearth of research at the organization level (Ozgen, Nijkamp, and Poot 2011). A rich tradition of small-scale qualitative research has explored diversity issues for firms in cities (for London, see, for example, Sepulveda, Syrett, and Lyon 2011; Smallbone, Kitching, and Athayde 2010; Kitching, Smallbone, and Athayde 2009; and Basu 2002). However, our work is the first large-scale quantitative analysis for urban firms that we are aware of.

This article links literatures by using econometric methods to investigate connections between diversity channels and business performance in London. In doing so, we build on a wider economic geography tradition that has investigated both economic development processes in particular cities and the literature on London (Sassen 1991; Gordon and McCann 2005; Breau and Rigby 2006; Wood 2009). This dual perspective is important. Diversity-performance effects may be amplified in an urban context, where populations are more diverse and firms benefit from agglomeration economies (Jacobs 1969). At the same time, economic outcomes are influenced by specifically local demographic and social contexts (Massey 1984).

London is a particularly important site of study. The UK capital is one of the original “global cities” (Sassen 1991). It dominates the UK economy: with 13 percent of the UK population in 2006–07, it contributed about 20 percent of national gross value added (Gordon et al. 2007). Historically, the most diverse city in Britain, in the 2000s London also embodies an emergent “superdiversity,” as established minority communities are joined by a wide range of newer migrant groups (Vertovec 2007; Sepulveda et al. 2011). At least 300 languages are now spoken in the capital, with more than 50 countries represented (Baker and Eversley 2000; Greater London Authority 2008). The city’s cultural diversity is widely seen as an economic strength by national and local governments as well as London’s business community (London First 2008; Leadbeater 2008; Home Office and Department of Work and Pensions 2007; Legrain 2006), assumptions that need to be tested (Smallbone et al. 2010; Sepulveda et al. 2011).

Our analysis also contributes to wider debates about the desirability of multicultural cities and communities in the United Kingdom. Sceptics, such as Goodhart (2004), have contended that diversity is a profoundly disruptive social and economic force. In contrast, Gilroy (2004) argued strongly for a vision of “convivial multiculturalism” against “post-imperial melancholia” and “race talk.” Other work has highlighted structural problems of segregation and discrimination that point to fundamental problems of managing difference (Ettlinger 2009; Phillips 1998).

So what aspects of diversity actually help or hinder business performance and for what kind of firms? We used rich data from the London Annual Business Survey (LABS) to investigate links between firms’ ownership characteristics and a range of business performance measures—innovation, sales orientation, and entrepreneurship. Our data have a number of advantages.

Unlike other studies, we focused on management—since owners or partners are responsible for the formation of firms, typically make many key business decisions, and sit in positions of power within organizations—and distinguished the effects of management from wider workforce diversity. Our data also allowed us to distinguish between firms’ knowledge intensity and between mixed and migrant-headed businesses and to identify migrant founders of firms.

Our results suggest small but robust positive connections between managerial diversity on the development of major new products and between migrant-run firms and process innovation. In contrast to the wider literature, we also found diversity-innovation links in both high-value knowledge-intensive sectors and in ordinary, less knowledge-

intensive activity. We also highlight a link between the diversity of migrants and exporting: while ethnically diverse firms are more likely to sell in London's large and diverse home markets than are UK-run businesses, migrant-diverse firms are more internationally oriented. Finally, migrant status has robust associations with proactive entrepreneurial behavior. While studies in this field have faced a number of identification challenges, we were able to deal with most of these challenges through checks of robustness and a shift-share instrument. Overall, our findings suggest a small but significant "diversity bonus" and support claims that London's cultural diversity acts as an economic asset.

The article is structured as follows. The next section defines key terms and outlines why diversity may lead to improved firm performance. The third section introduces the data set and discusses identification issues. The fourth section presents a descriptive analysis. The fifth through seventh sections introduce models and results for innovation, sales, and start-ups. The eighth section sets out robustness checks. The final section presents the conclusion and makes suggestions for further research.

370 Framework: Concepts, Theory, and Evidence

Defining Identity and Diversity

To define cultural or ethnic diversity¹ one first needs a specification of "cultural identity." Neither is straightforward; identity is a multifaceted concept, with subjective elements, and categories that alter over time (Aspinall 2009). Thus, quantitative researchers have tended to focus on stable, preferably objective, proxies for identity (Ottaviano, Bellini, and Maglietta 2007).² Our data allowed us to use two proxy measures, country of birth and ethnic group, which are widely used in the literature (Lee 2011). Neither of these measures is perfect. Country of birth is an objective, fine-grained but one-dimensional measure; it cannot, for example, identify UK-born minority communities. Ethnic group classifications focus on "visible minorities," such as black and minority ethnic (BME) groups, but operate at a high level of generality (Mateos 2007). Country of birth and ethnic group are distinct but overlapping; some migrants are members of BME groups, and some recent minority communities may be largely foreign born (Kyambi 2005).

Our identity measures allowed us to develop simple diversity metrics. The literature typically deploys complex measures, such as fractionalization or isolation index, to model demographics across countries or cities. By contrast, we distinguished different kinds of "diverse firms" (those with migrant or ethnically mixed owners/partners), "homogeneous firms" (with all U.K.-born, all migrant or other minority ethnic top teams), and a subset of "migrant entrepreneurs" (migrant founders of companies). Doing so allowed us to identify separately firms in which coethnicity channels may operate and in which diversity channels may be found.

Diversity and Business Performance

A growing body of area-level research has suggested links between aspects of urban cultural diversity and economic performance. In practice, these area-level results reflect multiple processes that largely operate at the level of firms; this section sets out the most important.

¹ We use *cultural diversity*, *ethnic diversity* and *diversity* interchangeably.

² If identity is entirely self-ascribed, it becomes hard to link behavior to measures (Casey and Dustmann 2009). However, in practice, it is unlikely that (for example) commercial success may lead business owners of South Asian origin to identify as "white British."

Business innovation. We followed the common definition of *innovation* as “the successful exploitation of new ideas” (Department of Innovation Universities and Skills 2008). Innovation thus involves both the “upstream” generation of ideas and their “downstream” commercialization, in the form of new products and processes (Fagerberg 2005). Diverse teams may be more effective than homogeneous teams in problem solving or generating new ideas—both new products and processes. Specifically, “cognitively diverse” groups leverage a wider pool of perspectives and skills (Berliant and Fujita 2009; Page 2007). A crucial point is that cultural diversity is a good proxy for cognitive diversity (Hong and Page 2001, 2004). These dynamics may be particularly important in research-based or knowledge-intensive activities (Fujita and Weber 2003). Conversely, a diverse set of managers may find it harder to communicate, and levels of trust may also be lower (Alesina and La Ferrara 2004). As a result, organizations may find it more difficult to make decisions or allocate resources, and the quality of those decisions may be lower than in more homogeneous organizations, which negatively affects both the generation of ideas and commercialization activity. Discrimination from customers may also make it harder for diverse or migrant/minority firms to commercialize their inventions successfully. We needed to identify these various forces as far as possible.

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Market access. Firms with diverse management or that are migrant/minority run may have access to diasporic networks. Coethnic networks may reduce information and communication costs because knowledge is exchanged through groups with greater mutual understanding and trust (Docquier and Rapoport 2011; Rodríguez-Pose and Storper 2006). These links are likely to affect sales orientation. Firms with diasporic connections may have better access to international markets (Bresnahan and Gambardella 2004); national governments have increasingly used high-skill diaspora communities in development strategies, so that diasporic membership is constituted by identity and governmental action (Larner 2007). Alternatively, such firms may be “spatially rooted,” leveraging access to particular locally embedded markets and communities (Gilbert 2000; Zhou and Tseng 2001); in global cities, such firms can also sell to cosmopolitan consumers (Mazzolari and Neumark 2009). However, diverse or coethnic firms may face additional constraints in the marketplace. As with innovation, a lack of connections to mainstream economic institutions or discrimination may make it harder to translate social connections into business practices (Gordon et al. 2007). Spatial embeddedness may also become a form of constraint, for example, segregation within the city (Gilbert 2000; Zenou 2009). Our modeling needed to distinguish these different market scales, as well as the forces that shape opportunities for, and constraints to, market access.

Entrepreneurship. Following Say (2010), we defined an entrepreneur as someone who both founds her or his own business and employs others. A number of studies have explored links between migrant and minority status and entrepreneurial behavior. Potential roles for ethnic entrepreneurs have shifted over time, reflecting both changing group opportunities and deeper shifts in national and global economic institutions (Kloosterman and Rath 2001; Aldrich and Waldinger 1990). Early analyses concentrated on the potential of “middleman” status between local majority and minority communities: enterprising minority individuals are able to identify new market opportunities and “translate” between social groups (Bonacich 1973). More recent studies have focused on the role of international migrants and transnational communities under globalization (for a review, see Honig, Drori, and Carmichael 2010). Notably, Wadhwa et al. (2007) suggested that decisions to migrate reflect both expected returns and the taste for risk

taking so that migrants may be highly entrepreneurial. Each perspective suggests that migrant/minority status is positively associated with the formation of firms, reflecting proactive entrepreneurial behavior associated with identifying and exploiting new business or market opportunities. Alternatively, individuals may be compelled to found new businesses because of exclusion from economic opportunities, either in the labor market or within organizations (Kloosterman and Rath 2001; Zhou and Tseng 2001). Individual responses may also be highly entrepreneurial in these reactive contexts.

The presence of ethnic entrepreneurs may also influence our other two outcomes of interest. Entrepreneurial individuals are key to the innovation process within organizations, especially large firms (Schumpeter 1962). Ethnic entrepreneurs may also act as “reputational intermediaries,” forging partnerships that deliver greater access to markets either internationally or to locally embedded communities (Kapur and McHale 2005; Saxenian and Sabel 2008; Honig et al. 2010). Our empirical innovation and market orientation analysis therefore tried to isolate firm-level from individual-level mechanisms.

372 Three important points have emerged from this brief review. First, both diversity and coethnicity may affect the performance of firms. Second, in principle, diversity and migrant/minority status have an ambiguous effect on business performance; in practice, negative effects may give way to positive effects, leaving a positive net impact (Lazear 1998). Third, culture and ethnicity have a distinct (and likely greater) effect at the senior level than across the wider workforce because management and the workforce occupy different positions in both the (visible) organizational structure and the (less visible) power structures, even if the organization is nominally flat rather than Taylorist/Fordist (see Baldry, Bain, and Taylor 1998; Thompson and Warhust 1998). Owners and partners are most likely responsible for the formation of firms and regardless of the organizational model, are most likely (with managers) to make the firm’s important decisions on strategy, sales, joint ventures, and production. Outside firms, there may also be city-level effects that influence, but are distinct from, firm-level channels: ideally, the two should be able to be identified separately (Glaeser and Kerr 2009; Glaeser, Kerr, and Ponzetto 2010).

Evidence Base

A handful of studies have looked specifically at diversity and business at the level of firms. Ozgen et al. (2011) found some positive links between the share of migrant workers, workforce diversity, and innovation in knowledge-intensive Dutch firms. In Denmark, Parrotta, Pozzoli, and Pytlikova (2011) found significant positive effects of cultural diversity on firms’ propensity to innovate and on productivity—but again, only in white-collar sectors employing predominantly skilled workers. Maré and Fabling (2011) and Maré, Fabling, and Stillman (2011) found no systematic links between workforce characteristics and innovation, but some productivity links among businesses in New Zealand.

A larger number of studies in the management literature have investigated diversity and market orientation (see Page 2007 for a recent review). For example, in a study of 165 Swiss firms, Nielsen (cited in Hart 2010) found that a mix of nationalities on management teams is linked to higher rates of entry into foreign markets and greater profitability. International evidence from economic geography also suggests that diasporas can engage in innovative activity. Saxenian (2006) and Saxenian and Sabel (2008) provided detailed evidence on the roles of migrant diasporas in Silicon Valley, which have strong links to production clusters in India, Taiwan, and (increasingly) China. Similarly, Kapur and McHale (2005) and Kerr (2008) detailed the roles of diasporas in

the development of information and communication technology clusters in Ireland, Israel, and South East Asia. Dahlman (2010) showed national governments in Brazil, Russia, India, and China have taken an increasingly active role in those countries.

Several qualitative studies have shown how migrant entrepreneurs start firms in new countries and use contacts in their countries of origin as an advantage in business: a process of “transnationalism from below” (Zhou and Tseng 2001; Henry, MacEwan, and Pollard 2002). Kitching et al. (2009) found suggestive evidence that in London, diasporic links help minority-owned firms, but this is strongly conditioned by owners’ capabilities and the size and reach of diasporas. Similarly, Sepulveda et al. (2011) found affordances of locally embedded coethnic networks in London, but these networks varied across and within communities.

Empirical evidence on ethnic entrepreneurship is mixed. Some migrant and minority communities make disproportionate contributions to the creation of knowledge in U.S. science (Stephan and Levin 2001). Migrants also account for a disproportionate number of start-ups in U.S. regions like Silicon Valley and the Raleigh-Durham Triangle (Saxenian and Sabel 2008; Wadhwa et al. 2007). But much of the “star” effect appears to be derived from sectoral hiring patterns, rather than migrant or ethnic status (Hunt and Gauthier-Loiselle 2010). Qualitative research in the United Kingdom has highlighted the role of migrant communities in retail and leisure hybridization (Ram and Smallbone 2003; Kitching et al. 2009; Sepulveda et al. 2011). However, levels of self-employment seem to vary by migrant group, host country, and class structure, as well as economic opportunities and locally specific conditions (Basu 2002, 2004; Nakhaie, Lin, and Guen 2009). For example, Zhou and Tseng found that ethnic Chinese high-tech firms in Los Angeles reflect both the experience of glass ceilings in majority-owned businesses and an increasing set of transnational resources, such as East Asian producer and venture capital networks (Zhou and Tseng 2001). Conversely, the city’s Chinese accountancy businesses are deeply embedded in historic “ethnic enclaves.”

Creative class theory provides an alternative framework. Florida (2002) suggested that liberal, tolerant, skilled workers are important for economic success and are attracted to diverse cities and firms. This liking for diversity may attract such creative individuals to London and to diverse firms within the city. However, creative class models have been criticized for empirical reasons (Glaeser 2005) and for theoretical reasons (Peck 2005); they also tend to lose their predictive power in the United Kingdom (Nathan 2007).

Data and Identification

We used the London Annual Business Survey (LABS) to investigate the links among ethnicity, cultural diversity, innovation, market orientation, and entrepreneurship. LABS is a survey of firms conducted by the London Development Agency (then the economic development agency for London). The questionnaire is conducted with chief executive officers, managing directors, or other senior managers, and asks a range of questions covering the formation of firms, workforce and management characteristics, performance, and constraints.

LABS has a number of useful features. It provides a large sample for a single city, as well as a rich set of variables (compared to other studies using linked employer-employee data or census information).³ We have information on two aspects of diversity (country

³ Raw data were weighted across subregions so that the employers who were surveyed formed appropriate size and sector proportions and the total number of employers reflected London’s overall population.

of birth and ethnicity) and can distinguish owners/partners from the wider workforce.⁴ LABS also provides detailed information on industrial classification allowing us to fit precise industry fixed effects and distinguish firms by knowledge-intensity.⁵

While LABS covers the whole of London's private sector, it excludes public-sector businesses and self-employed sole traders (although it includes self-employed people trading as companies). A further limitation of LABS is that it is purely cross sectional, with no prospect of tracking even a subset of firms through time. However, firms are given one of 33 borough-level spatial identifiers, allowing us to place them within London; we exploited this feature to help with identification.

We pooled LABS cross sections from 2005–07 to create a sample of 7,615 firms. Each cell represents a firm * SIC3 sector * year sampled. This sample structure presented us with multiple challenges in identifying causal effects, many of which have been shared by other studies in the field. Here we preview the three main issues and our responses.

374 First, an external shock at the city level may cause levels of diversity and business performance to change together in ways that are not captured in firm-level data. We began our sample in 2005, using the policy shock of A8 Accession to minimize this problem. "A8 Accession" refers to the eight Central and Eastern European countries that acceded to the European Union (EU) in 2004 (the A8). At the time, all existing EU member states apart from the United Kingdom and Sweden placed heavy restrictions on potential A8 immigrants. The United Kingdom's stance was largely informed by official studies suggesting low inflows (Dustmann et al. 2003). However, this lack of entry barriers unexpectedly prompted one of the largest inflows of migrants to the country since World War II, including large flows to London. Accession thus substantially influenced "superdiversity" in London, affecting the total population, group numbers and relative group sizes ("Second Thoughts" 2006; Vertovec 2007). We argue that the United Kingdom's policy stance in 2004 represented an unintended policy shock that directly raised levels of migration and cultural diversity in London, but with no comparable direct effects on business performance.

Second, firm-level diversity effects may turn out to be something else—either sectoral characteristics or individual-level factors (such as human capital or entrepreneurial zeal). We dealt with potentially omitted sectoral factors by fitting detailed industry-level fixed effects. Individual-level factors are partly covered through controls for human capital and partly through separate checks of robustness that tested for the influence of individual entrepreneurs on firm-level outcomes. In the same spirit, we also ran regressions that included both management and workforce diversity measures to isolate the potentially distinct channels.

Third, there is potentially both-ways causation at the level of firms—for example, if managers react to observed positive diversity effects by recruiting more diverse colleagues. The cross-sectional nature of our data made this issue much harder to deal with; however, we were able to combine firms' local spatial identifiers with historic local area information to construct some basic shift-share instruments that partially identified causality.

A final problem we faced is that LABS is, by definition, available only for London firms. Given London's unique position in the UK urban system, we faced obvious limits to the external validity of our findings. We return to this point at the end of the article.

⁴ Owners/partners were either survey respondents or other senior individuals, not institutions.

⁵ We restricted the sample to SIC3 sectors represented in all three years. Sectors that were excluded were agriculture, forestry, and hunting; fishing; mining and quarrying; and secondary manufacture related to these sectors, such as food processing.

Key Variables and Descriptive Analysis

Identity and Diversity Measures

We defined *migrant-diverse* firms as companies with a mix of UK-born and foreign-born owners/partners. We then defined *migrant firms* as those with all foreign-born owners/partners. Finally, we defined *UK firms* as those with no migrant owners/partners. We fit dummy variables for all three, taking the value 1 if the firm fell into the relevant category.

Our second dimension is ethnicity. A dummy variable for ethnic-diverse firms was derived from the question, “whether at least half the owners are white British.” We defined the variable so it took the value 1 if at least half the owners were from minority ethnic groups. Because we could not precisely identify whether ethnic-diverse firms were wholly minority run, we used this term as a cross-check for our preferred migrant-based measures.⁶ Although these are not perfect measures of diversity at the firm level, they reflect the impact of diversity at the city level on innovation in London as a whole.

Business Performance Measures

Innovation. We developed a number of measures covering product and process innovations. We fit four dummies taking the value of 1 if the firm had, in the past 12 months: (1) introduced a major new product or service, (2) significantly modified its product range or services, (3) introduced major new equipment, or (4) introduced major new ways of working. These measures were all designed to capture significant innovations, rather than minor changes, although (2) and (4) may capture less radical shifts in firms’ behavior.⁷

We also distinguished knowledge-intensive and non-knowledge-intensive firms using OECD definitions. The former included pharmaceuticals, electronics, software, finance, and business services; the latter included low-tech manufacturing, retail, and personal and protective services. We also identified innovation by knowledge-intensive business services (KIBS), which may better represent the knowledge economy in a service-based city like London (Wood 2006).⁸ Ascribing types of firms provided a second source of information on the significance of innovations, allowing us to distinguish innovative activity in high-value KIBS sectors from that in less knowledge-intensive, “ordinary” industries (Moretti 2012). There are limitations to this approach, because it cannot distinguish firms performing knowledge-intensive functions in non-knowledge-intensive sectors.⁹

⁶ The pairwise correlation between migrant firms and ethnic diverse firms was 0.54 versus 0.0054 for migrant-diverse and ethnic diverse firms. This correlation suggests that migrant-diverse and ethnic-diverse measures need to be fitted separately and some overlap between all-migrant and ethnically diverse businesses.

⁷ Smith (2005) highlighted the danger of response bias toward innovating firms and the difficulty of constructing survey questions that can capture the different innovation processes across manufacturing and service-sector firms. LABS deals with the latter by applying broad definitions of *innovation*. It may thus risk capturing some trivial innovations, especially in relation to new ways of working.

⁸ We used the definition of KIBS from Wood (2006). The mix of three- and four-digit SIC sectors includes financial intermediation, insurance and pension funding, auxiliary financial activities, real estate, legal, accountancy, hardware/software consultancy, data processing/database activities, advertising, market research, business/management consulting, architecture and engineering, technical testing, and research and development.

⁹ Future work with larger samples may want to test on a sector-by-sector basis to see whether the processes assessed here apply in each. Another alternative to the methodology we used would be to break down the sample into different subcategories of knowledge-intensive firms.

Commercialization. Next, we constructed measures of commercialization. A commonly used proxy for commercialization is rapid revenue growth: innovation researchers define fast-growing “gazelle” companies as those achieving an annual turnover growth of 20 percent or more (Council on Competitiveness 2005). LABS provides some turnover information; we constructed four dummy “commercialization” variables that take the value of 1 if firms have met criteria (1) to (4) (described earlier) and seen an annual revenue growth of at least 10 percent.

Sales orientation. LABS provides information on market orientation at various levels, although in less detail than we would like given our interest in specific coethnic networks. We broke down a firm’s share of sales in three geographic areas: within London, within the rest of the United Kingdom, and in the rest of the world. We refer to these areas as local, national, and international sales.

376 **Entrepreneurship.** Finally, LABS allowed us to identify respondents who were directly involved in founding each firm and their motivation for doing so. We observed some migrant founders by identifying firms in which both the respondent was a founder and all owners/partners were non-UK born.¹⁰ Following our previous discussion on entrepreneurship, we identified the share of founders who set up firms for reasons roughly corresponding to proactive entrepreneurial behavior (e.g., “I wanted to start my own business”), and for reactive reasons that may reflect economic exclusion from existing labor markets (e.g., “I found it hard to get work”).¹¹ We then constructed dummy variables for proactive founders, reactive founders and other founders, by country of birth. (Note that these terms are intended to be descriptive, rather than making a judgment on the relative value of proactive/reactive entrepreneurial activity.)

Descriptives

Table 1 presents some key descriptive results. The first panel covers innovation and commercialization variables. About 25–30 percent of the firms in the sample innovated in some way (for example, 31.4 percent of the firms introduced a major new product or service). Just over 36 percent of the firms were gazelles, and, as expected, fewer firms were able to commercialize new ideas successfully (less than half the number who innovated). The first panel also shows, for a subset of firms, the share of annual company turnover from new products and processes. Since only a minority of respondents answered this question, we reserved it for robustness checks.

The second panel covers diversity variables and reflects London’s rich mix of people. More than 39 percent of the firms had at least one migrant owner/partner: 18 percent were migrant diverse, with a mix of UK-born and migrants, and 21.3 percent were migrant firms with all migrant owners/partners. To put it another way, of the firms with at least one migrant owner/partner, 53 percent were migrant-run. About 21 percent of the firms were ethnic diverse (had at least half owners/partners from minority ethnic communities).

¹⁰ We were unable to observe all migrant founders (migrant founders of firms with a mixed management team were excluded). We were also unable to identify minority ethnic founders.

¹¹ Specifically, we selected the three most common proactive and reactive reasons for the formation of firms. For the former, these reasons were “I wanted to start my own business,” “I wanted a new challenge,” and “I wanted to be my own boss.” For the latter, these reasons were “I was made redundant,” “I found it hard to get work,” and “My old business collapsed.” We excluded around 8 percent of the respondents who gave answers covering more than one of these categories.

Table I

Summary Statistics

Variable	N	Mean	SD	Minimum	Maximum
Firm introduces major new products or services	7,615	0.314	0.464	0	1
Major modifications to product/service range	7,615	0.261	0.439	0	1
Major new equipment	7,615	0.228	0.42	0	1
Major new working methods	7,615	0.258	0.437	0	1
Gazelle, annual revenue grows \geq 10 percent	7,615	0.364	0.481	0	1
Gazelle, major new products or services	7,615	0.13	0.336	0	1
Gazelle, significance modifies products or services	7,615	0.109	0.312	0	1
Gazelle, major new equipment	7,615	0.096	0.294	0	1
Gazelle, major new ways of working	7,615	0.107	0.308	0	1
Turnover from innovations in past 12 months (percentage)	2,552	20.515	21.705	0	100
Firm has zero migrant owners/partners	7,615	0.598	0.49	0	1
Firm has all migrant owners/partners	7,615	0.213	0.409	0	1
Firm has some migrant owners/partners	7,615	0.18	0.384	0	1
<i>Of which migrant-run firm</i>	3,058	0.53	0.499	0	1
Firm has at least half minority ethnic owners/partners	7,615	0.214	0.41	0	1
Company's age	7,615	16.011	21.415	2	307
Number of employees	7,615	22.49	63.82	1	1700
Firm collaborates with others	7,615	0.299	0.458	0	1
Firm does R&D	7,615	0.337	0.473	0	1
Firm exports	7,615	0.213	0.409	0	1
Firm is PLC	7,615	0.038	0.191	0	1
Knowledge-intensive firm (OECD definition)	7,615	0.472	0.499	0	1
Less knowledge-intensive firm (OECD definition)	7,615	0.528	0.499	0	1
Knowledge-intensive business services firm	7,615	0.19	0.392	0	1
% managers with management qualification	7,603	0.307	0.699	0	1
% who've completed management course	7,577	0.394	0.812	0	1
% with informal/on-job management training	7,591	0.573	0.834	0	1
% with prior management experience	7,593	0.565	0.708	0	1
Sales in London (percentage)	7,164	74.437	33.193	0	100
Sales in rest of United Kingdom (percentage)	7,164	19.035	27.37	0	100
Sales in rest of world (percentage)	7,164	6.533	19.021	0	100
Respondent is a/the founder of the a firm	6,952	0.540	0.498	0	1
Respondent is migrant and a/the founder of a firm	6,952	0.122	0.328	0	1
Founder, proactive reason for starting the firm	3,752	0.276	0.447	0	1
Founder, reactive reason for starting the firm	3,752	0.099	0.299	0	1
Founder, other reasons for founding the firm	3,752	0.624	0.484	0	1
Migrant, proactive reasons for starting the firm	851	0.304	0.460	0	1
Migrant, reactive reasons for starting the firm	851	0.081	0.273	0	1
Migrant, other reasons for starting the firm	851	0.615	0.487	0	1

Source: LABS.

Note: Not all firms answered all questions on management ability.

The third panel shows that 3,594 were knowledge-intensive firms, about 48 percent of the sample. Within this category, KIBS firms made up 19 percent of the sample. The fourth panel provides summary statistics on sales orientation. Overall, firms in the sample were oriented toward markets in London, which accounted for nearly three-quarters of the sales. Just 6 percent of the sales were outside the United Kingdom. The fifth panel looks at reasons for the formation of firms. The numbers suggest that compared to founders as a whole, a higher share of migrant founders founded the firms for

Table 2
Innovative Activity by Type of Firm

Type of Firm	Major or New Product/Service	Modified Product/Service	Major New Equipment	New Way of Working
All firms	0.304	0.257	0.257	0.257
Non-knowledge intensive	0.292	0.23	0.221	0.239
Knowledge intensive	0.317	0.288	0.228	0.266
KIBS	0.306	0.284	0.184	0.249

Type of Firm	Commercialized New Product/Service	Commercialized Modified Product/Service	Commercialized New Equipment	Commercialized New Way of Working
All firms	0.127	0.107	0.094	0.105
Non-knowledge intensive	0.107	0.085	0.089	0.089
Knowledge intensive	0.149	0.132	0.098	0.123
KIBS	0.159	0.135	0.09	0.121

Source: LABS.

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entrepreneurial reasons (30.4 percent versus 27.6 percent), with a lower share being reactive (8.1 percent versus 9.9 percent).

Table 2 breaks down innovation and commercialization by type of firm. In almost all the cases, knowledge-intensive firms were more likely than average, more likely than non-knowledge-intensive firms to generate new ideas, and more likely to commercialize those ideas successfully. KIBS firms were also more likely than average to engage in product innovation and to commercialize innovations. Rates of the generation or adoption of ideas were slightly less than those of knowledge-intensive firms as a whole; the rates of commercialization were marginally higher. On that basis, innovation in London's firms is more likely to be "important" than "ordinary."

Innovation

We first explore links between management demographics and innovation in firms. We developed a firm-level knowledge production function, linking the probability of innovative activity occurring to a diversity measure, firm-level controls, sector, and year effects. For firm i in year t , we estimated:

$$\Pr(Y_{it} = 1) = a\text{DIV}_{it} + \mathbf{CONTROLS}_{it}b + \text{SECTOR}_i + \text{YEAR}_t + e_i, \quad (1)$$

where Y is one of our measures of the generation or commercialization of ideas, as described earlier; DIV is the variable of interest and covers whether firms are migrant diverse, ethnic diverse, or migrant only. CONTROLS represents a set of control variables, with descriptives in the third panel of Table 2. SECTOR and YEAR are dummy variables for SIC3 sectors and years, respectively.

We selected controls to reflect the literature on firm-level innovation, as well as wider business performance. Sectoral variation is accounted for via fixed effects and an additional dummy variable that takes the value 1 if a firm is part of KIBS. This approach also controls for the tendency of migrant/minority groups to cluster in certain sectors (Green 2007). Large or established firms often generate large amounts of patent activity, but small and/or new firms may introduce disruptive innovations (Griffith, Huergo, Mairesse,

and Peters 2006). Following initial diagnostics, we fit the log of age and the log of firm size and firm size squared. We also fit a dummy variable for type of company: firms that are Public Limited Companies (PLCs) may be more innovative since they need to satisfy shareholders of their value.

We completed the model with a dummy variable for exports, which also helped control for the ability of firms to access international product markets and knowledge. There is an established literature on “open innovation” and collaboration, with firms that collaborate likely to access external knowledge and produce more innovations (Von Hippel 2005). We use a simple dummy variable for whether a firm collaborates. We also included a dummy variable for research and development (R&D) spending, reflecting the wide literature linking R&D and long-term business performance (Romer 1990).¹²

LABS does not have conventional information on human capital.¹³ However, the survey provides detailed information on management experience and qualifications (shares of firms’ managers with previous experience, formal qualifications, and on-the-job training or with completed in-work management courses). We fit all four as controls for management ability.¹⁴ All should be positively correlated with innovative activity.

We estimated the model as a conditional logit, which allows data to be grouped by sector and handles sector-specific, time-invariant effects well. All specifications used HAC standard errors clustered on the SIC3 sector. Diagnostics suggested a small number of outlier firms; removing them made little difference to the results.

The results are set out in Tables 3–9. For ease of interpretation, coefficients are given in odds ratios. Odds ratios above 1 indicate a positive association with the dependent variable, odds ratios below 1 indicate a negative link. Tests suggested that the model is generally well specified, collinearity is not an issue (the mean VIF is about 1), and controls behave as expected.

Results for Innovation and Commercialization

Table 3 presents our basic results for product and process innovation. First, we found evidence that both diverse firms and migrant-run firms are more likely to introduce product innovations. The odds ratio of migrant diversity is 1.528 (column 1), falling to 1.238 when controls are added (column 2). Both are significant at 1 percent. This finding suggests that relative to firms with no migrant owners/partners, the odds of introducing a new product or service are about 1.24 times higher for diverse firms. Note that this specification also controls for having all-migrant owners/partners. Diverse firms are also more likely to introduce modifications to the product/service line: with controls, the odds ratio is 1.192, significant at 5 percent (column 4). Having all-migrant owners/partners gives weaker links to innovation, although for modified products/services, the odds ratio is 1.182, significant at 5 percent. Second, in process innovation, migrant-run firms play important roles (columns 5 and 6). Migrant firms are about 1.19 times more likely to introduce new equipment; they are 1.164 times more likely to introduce new ways of working.

¹² LABS also asks about levels of R&D spending. However, most firms do not provide this detailed information, and more than 80 percent of observations are missing in our panel. By contrast, we have almost complete information for the R&D dummy variable, so this is our preferred measure.

¹³ We experimented with a proxy by interacting the number of employees in the firm with the relevant industry-level share of graduates. *F* tests suggest that the control makes little difference to the overall performance of the model, so we excluded it from the final specification. Investigating the link between diversity and qualifications at different levels within the firm should be an important area of future research.

¹⁴ Controls passed the Wald and likelihood-ratio tests of joint significance.

Table 3

Firms Introducing Product and Process Innovations

	New Product/Service		Modified Product/Service		New Equipment		New Ways of Working	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migrant diverse firm	1.528*** (0.113)	1.238*** (0.084)	1.434*** (0.131)	1.192** (0.097)	1.341** (0.170)	1.128 (0.117)	1.385*** (0.158)	1.158 (0.110)
Migrant firm	1.050 (0.077)	1.134 (0.087)	1.123 (0.109)	1.182** (0.095)	1.129 (0.113)	1.188** (0.101)	1.101 (0.096)	1.164** (0.089)
Age of Firm (natural log)		0.842*** (0.033)		0.898*** (0.031)		0.988 (0.031)		0.908*** (0.031)
Number of employees (natural log)		1.441*** (0.128)		1.299*** (0.110)		1.474*** (0.121)		1.480*** (0.090)
Number of employees (natural log) ²		0.961** (0.015)		0.974* (0.015)		0.959*** (0.014)		0.958*** (0.010)
Firm collaborates		1.835*** (0.133)		1.646*** (0.104)		1.343*** (0.108)		1.422*** (0.098)
Firm does R&D		2.625*** (0.174)		2.094*** (0.135)		1.778*** (0.108)		1.927*** (0.119)
Firm exports		1.074 (0.083)		1.018 (0.080)		0.831** (0.069)		0.870** (0.059)
Firm is PLC		1.638** (0.329)		1.216 (0.150)		1.197 (0.230)		1.060 (0.167)
Qualified managers (percentage)		0.998 (0.141)		1.219** (0.119)		1.277*** (0.101)		1.080 (0.082)
Management course (percentage)		1.133 (0.176)		1.425*** (0.128)		1.197* (0.119)		1.367*** (0.116)
Management training (percentage)		1.020 (0.181)		1.232** (0.106)		1.063 (0.086)		1.363*** (0.078)
Management experience (percentage)		0.935 (0.146)		1.071 (0.069)		0.903 (0.063)		1.057 (0.093)
KIBS		2.466*** (0.823)		2.335** (0.977)		2.372 (2.200)		0.797 (0.325)
Observations	7529	7476	7510	7457	7486	7435	7494	7441
Pseudo R ²	0.005	0.088	0.004	0.071	0.002	0.041	0.003	0.059
Log likelihood	-4234.76	-3854.84	-3969.13	-3678.76	-3729.41	-3565.64	-4029.68	-3777.23

Source: LABS.

Notes: Results are odds ratios. HAC standard errors in parentheses. All specifications include year and SIC3 dummy variables; some observations were dropped because of perfect prediction groups. * = significant at 10 percent, ** 5 percent, *** 1 percent.

These results suggest that a number of the channels discussed previously are operating here. Through facilitating cognitive diversity, and so new ways of thinking, diversity itself may push forward the introduction of major new products and investments, as well as (potentially less radical) changes to product/service lines or changes in working practices. Migrant-run firms may also benefit from diasporic community membership as well as ethnic entrepreneurship; we found support for both channels in subsequent sections.

We then looked at whether firms can successfully bring these innovations to market. Table 4 suggests that once controls are included, few of the diversity variables have a significant link to commercialization. For both product and process innovation, none of the coefficients of DIV is significant and, in the case of migrant firms, the coefficients are generally close to zero. We cross checked for a subset of firms using our alternative commercialization measure; the results confirm our main findings. Although the diversity

Table 4

Firms Commercializing Product and Process Innovations

	New Product/ Service		Modified Product/Service		New Equipment		New Ways of Working	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Migrant diverse firm	1.354*** (0.141)	1.122 (0.121)	1.286** (0.136)	1.111 (0.132)	1.358*** (0.156)	1.163 (0.124)	1.217** (0.116)	1.042 (0.097)
Migrant firm	1.028 (0.119)	1.023 (0.119)	1.075 (0.140)	1.081 (0.130)	1.149 (0.157)	1.185 (0.148)	1.087 (0.138)	1.080 (0.121)
Age of Firm (natural log)		0.632*** (0.040)		0.645*** (0.035)		0.718*** (0.041)		0.660*** (0.035)
Number of employees (natural log)		1.385*** (0.118)		1.418*** (0.126)		1.701*** (0.233)		1.602*** (0.245)
Number employees (natural log) ²		0.964** (0.016)		0.959** (0.017)		0.932*** (0.024)		0.946* (0.028)
Firm collaborates		1.796*** (0.169)		1.710*** (0.164)		1.645*** (0.197)		1.502*** (0.122)
Firm does R&D		1.967*** (0.162)		1.918*** (0.186)		1.675*** (0.137)		1.762*** (0.158)
Firm exports		1.113 (0.094)		1.043 (0.109)		0.897 (0.099)		1.036 (0.117)
Firm is PLC		1.033 (0.161)		0.890 (0.181)		0.849 (0.188)		0.722* (0.130)
Qualified managers (percentage)		1.095 (0.114)		1.120 (0.132)		1.120 (0.119)		1.153 (0.126)
Management course (percentage)		1.190** (0.103)		1.336*** (0.147)		1.137 (0.132)		1.151 (0.143)
Management training (percentage)		1.108 (0.124)		1.147 (0.129)		1.149 (0.109)		1.265*** (0.103)
Management experience (percentage)		1.053 (0.088)		1.005 (0.106)		0.840 (0.093)		0.983 (0.108)
KIBS		0.835 (0.344)		0.713 (0.256)		3.082 (2.620)		0.697* (0.138)
Observations	7434	7370	7354	7301	7302	7243	7355	7305
Pseudo R ²	0.027	0.097	0.032	0.099	0.027	0.075	0.030	0.087
Log likelihood	-2555.12	-2346.35	-2238.54	-2068.58	-2104.29	-1986.53	-2270.11	-2119.61

Source: LABS.

Notes: Results are odds ratios. HAC standard errors are in parentheses. All specifications include year and SIC3 dummy variables; some observations were dropped because of perfect prediction groups. * = significant at 10 percent, ** = 5 percent, *** = 1 percent.

of London firms is strongly linked to new products and processes, it appears to play less of a role in the successful taking of these ideas to market. Innovating firms may be constrained by problems of discrimination or selling into niche markets. Alternatively, our commercialization measure may be too demanding. We return to this issue in the conclusion.

Table 5 presents the results for ethnic-diverse firms, which are used as a crosscheck and confirm the broad pattern of the previous findings. The first panel looks at innovation: ethnic-diverse firms have a positive relationship with levels of innovative activity. Odds ratios for the ethnic diversity variable are significant at 5 percent in almost all the models for both major and minor innovations. The second panel looks at commercialization. Ethnic diversity has some significant links to the successful exploitation of new processes; for commercializing new ways of working, firms with at least half minority ethnic owners/partners are 1.29 times more likely to have introduced new ways of working and raised annual revenue by at least 10 percent.

Table 5

Innovation and Commercialization for Ethnic-Diverse Firms

Innovation	New Product/ service		Modified Product/ Service		New Equipment		New Way of Working	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Ethnic-diverse firm	1.089 (0.095)	1.211** (0.101)	1.032 (0.093)	1.077 (0.080)	1.131 (0.118)	1.187** (0.103)	1.144 (0.107)	1.218*** (0.091)
Controls	N	Y	N	Y	N	Y	N	Y
Observations	7,529	7,476	7,510	7,457	7,486	7,435	7,494	7,441
Pseudo R ²	0.001	0.088	0.001	0.070	0.001	0.041	0.001	0.060
Log-Likelihood	-4253.437	-3855.603	-3981.824	-3682.347	-3735.615	-3565.890	-4037.946	-3776.440

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Commercialization	New Product/ Service		Modified Product/ Service		New Equipment		New Way of Working	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Ethnic-diverse firm	1.098 (0.107)	1.124 (0.100)	1.039 (0.108)	1.023 (0.102)	1.111 (0.117)	1.141 (0.119)	1.264* (0.152)	1.288** (0.141)
Controls	N	Y	N	Y	N	Y	N	Y
Observations	7,434	7,370	7,354	7,301	7,302	7,243	7,355	7,305
Pseudo R ²	0.025	0.097	0.031	0.099	0.025	0.074	0.030	0.088
Log-Likelihood	-2560.089	-2346.266	-2241.551	-2069.171	-2108.029	-1987.466	-2268.986	-2116.702

Source: LABS.

Notes: Results are odds ratios. HAC standard errors are in parentheses. All specifications include year and SIC3 dummy variable. Controls fitted: log firm age, log firm size, log size squared, collaboration dummy variable, R&D dummy variable, exports dummy variable, PLC dummy variable, percentage qualified managers, percentage who completed a management course, percentage with informal management training, percentage with management experience, KIBS dummy variable. Some observations were dropped because of perfect prediction groups. * = significant at 10 percent, ** 5 percent, *** 1 percent.

Comparing Types of Firms

Any benefits of diversity may matter most in sectors that rely on cognitive skills (Fujita and Weber 2003). These sectors' knowledge-intensive firms may also be more likely to engage in high value-added innovations. Tables 6 and 7 break down the analysis for knowledge-intensive and less knowledge-intensive companies. In each case, column 1 fits a dummy variable for knowledge-intensive firms, and column 2 fits interactions with migrant-diverse and migrant firms.¹⁵

The results show some important sectoral differences. For introducing major new products and services, there is no significant association with all-migrant top teams on the average firm. But knowledge-intensive migrant firms are 1.31 times more likely than are other migrant firms to introduce new products/services (column 2), and this effect is significant at 1 percent. For the other innovation measures, we found significant diversity-innovation links in *less* knowledge-intensive firms. For modifications to the product/service line, for example, we found positive significant coefficients for both diverse and migrant firms, but none for knowledge-intensive firms. However, firms that are both knowledge intensive and have diverse owners/partners are significantly *less*

¹⁵ Our knowledge-intensity typology is for the two- and three-digit SIC levels, so to avoid collinearity, the models presented here were run with industry fixed effects at the SIC1 level. Rerunning the main regressions with SIC1 controls did not substantively affect the main results.

Table 6

Product Innovation by Firms' Knowledge Intensity

	Major New Product/Service		Modified Product/Service	
	(1)	(2)	(1)	(2)
Migrant-diverse firm	1.240*** (0.083)	1.316*** (0.073)	1.250*** (0.080)	1.473*** (0.103)
Migrant firm	1.153* (0.098)	1.025 (0.066)	1.232*** (0.068)	1.221** (0.105)
Knowledge-intensive (KI) firm	1.168 (0.114)	1.127 (0.127)	0.984 (0.067)	1.034 (0.070)
KI * migrant diverse		0.888 (0.082)		0.728*** (0.067)
KI * migrant firm		1.313*** (0.129)		1.037 (0.101)
Controls	Y	Y	Y	Y
Observations	7,524	7,524	7,524	7,524
Log-likelihood	-4170.431	-4167.398	-3934.109	-3931.260

Source: LABS.

Notes: Coefficients are odds ratios. HAC standard errors are in parentheses. All specifications include year and SIC 1 dummy variables. Controls fitted: log firm age, log firm size, log size squared, collaboration dummy variable, R&D dummy variable, exports dummy variable, PLC dummy variable, percentage qualified managers, percentage completed management course, percentage with informal management training, percentage with management experience.

* = significant at 10 percent, ** 5 percent, *** 1 percent.

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Table 7

Process Innovation by Knowledge Intensity

	Major New Equipment		New Ways of Working	
	(1)	(2)	(1)	(2)
Migrant-diverse firm	1.083 (0.161)	1.348* (0.218)	1.181** (0.097)	1.363*** (0.091)
Migrant firm	1.169** (0.075)	1.152 (0.105)	1.190*** (0.062)	1.145* (0.088)
Knowledge-intensive (KI) firm	0.914 (0.076)	0.978 (0.102)	1.137 (0.096)	1.173* (0.100)
KI * migrant diverse		0.636** (0.138)		0.751** (0.084)
KI * migrant firm		1.057 (0.146)		1.104 (0.129)
Controls	Y	Y	Y	Y
Observations	7524	7524	7524	7524
Log-likelihood	-3838.197	-3832.756	-4012.463	-4009.598

Source: LABS.

Notes: Coefficients are odds ratios. HAC standard errors are in parentheses. All specifications include year and SIC 1 dummy variables. Controls fitted: log firm age, log firm size, log size squared, collaboration dummy variable, R&D dummy variable, exports dummy variable, PLC dummy variable, percentage qualified managers, percentage completed management course, percentage with informal management training, percentage with management experience.

* = significant at 10 percent, ** 5 percent, *** 1 percent.

Table 8

Market Orientation and Owner/Partner Diversity

Dependent Variable	Percentage Sales		
	Local	National	International
Migrant-diverse firm	1.348 (1.532)	-3.666*** (1.309)	2.318** (0.934)
Migrant firm	1.718 (1.290)	-4.128*** (1.102)	2.410*** (0.786)
Controls	Y	Y	Y
Observations	3089	3089	3089
R ²	0.281	0.205	0.185
Joint sig test chi ² statistic	24604.894	2546.327	1118.698
p value of joint sig test	0.000	0.000	0.000
Breusch-Pagan joint test chi ² statistic		2830.291	

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Dependent Variable	Percentage of Sales		
	Local	National	International
Ethnic-diverse firm	6.493*** (1.305)	-5.743*** (1.117)	-0.750 (0.800)
Controls	Y	Y	Y
Observations	3089	3089	3089
R ²	0.286	0.207	0.182
Joint sig test chi ² statistic	24799.371	2562.068	1102.669
p value of joint sig test	0.000	0.000	0.000
Breusch-Pagan joint test chi ² statistic		2816.633	

Source: LABS.

Notes: HAC standard errors are in parentheses. All specifications include year and SIC3 dummy variables. Controls fitted: log firm age, log firm size, log size squared, collaboration dummy variable, R&D dummy variable, exports dummy variable, PLC dummy variable, percentage qualified managers, percentage completed management course, percentage with informal management training, percentage with management experience, KIBS dummy variable. Some observations were dropped because of perfect prediction groups.

* = significant at 10 percent, ** 5 percent, *** 1 percent.

Table 9

Reasons for the Firm's Formation: Testing the Role of Migrant Founders

Reason for the Firm's Formation	Proactive (1)	Reactive (2)	Other Reason (3)
Migrant, firm founder	1.363** (0.193)	0.859 (0.188)	0.804* (0.096)
Controls	Y	Y	Y
Observations	3632	3475	3665
Pseudo R ²	0.004	0.008	0.004
Log-likelihood	-1986.189	-1017.156	-2224.185

Source: LABS.

Notes: Coefficients are odds ratios. HAC standard errors are in parentheses. All specifications include year and SIC3 dummy variables. Controls fitted: log firm age, log firm size, log size squared, collaboration dummy variable, R&D dummy variable, exports dummy variable, PLC dummy variable, percentage of qualified managers, percentage completed a management course, percentage with informal management training, percentage with management experience, KIBS dummy. Some observations dropped because of perfect prediction groups.

* = significant at 10 percent, ** 5 percent, *** 1 percent.

likely to innovate (column 2). All these findings are significant at 1 percent. We found similar results for process innovation measures (see Table 7).

We repeated the analysis with commercialization measures, but as in the main results, we found no significant links to either diversity measure. We also cross checked using ethnic diversity measures. The only significant results were for new products/services. Ethnic diversity is positively and significantly linked to innovation, but knowledge-intensive businesses are less likely to innovate.

Overall, these results contrast with those in the wider literature. We found that benefits from management diversity and migrant-headed businesses apply across all types of firms, not just knowledge-intensive businesses. This finding suggests that the diversity bonus in London firms contributes at least as much to ordinary sectors as to high value-added activity.

Market Orientation

Next, we turn to links between management characteristics and market orientation. If diverse or migrant-headed firms are particularly geared toward local markets, it implies that London's large and diverse consumer economy may be shaping sales strategies. Conversely, if diverse firms are more internationally oriented, the combination of diaspora networks and London's connectivity may be more important.

To establish whether firms' cultural diversity has any influence on markets served, we estimated a simple model:

$$Y_{it} = a + bDIV_{it} + \mathbf{CONTROLS}_{it}c + SECTOR_i + YEAR_t + e_i, \quad (2)$$

where Y is one of our sales share measures, DIV is one of our diversity measures, and $CONTROLS$ is a reduced set of controls (age of firm, size of firm, and its square root, dummy variable for collaboration and R&D spending, plus the four management ability measures, year, and SIC3 dummy variables). We fit the model as seemingly unrelated regressions, which provided some efficiency gains from ordinary least squares (OLS).¹⁶

The results are given in Table 8. The first panel looks at migrant-diverse and migrant firms relative to UK firms (the reference category). As expected, we found a positive link between both types of firm and local sales, although neither is significant. By contrast, we found strongly significant negative relationships with national market orientation and strongly positive links to international sales. For the latter, the coefficient of diverse firms is 2.318, significant at 5 percent, and for migrant firms 2.410, significant at 1 percent. These raw coefficients translate respectively into 2.3 and 2.4 percentage-point differences in sales shares. Firms with some or all-migrant owners/partners are thus significantly more likely than are UK-run firms to sell to international markets and are less likely to operate in the rest of Britain.

The second panel of the table presents the results for ethnic-diverse firms. These results are strikingly different from the results for the first panel. Ethnic-diverse firms have local sales shares nearly 6.5 percentage points higher than more homogeneous firms, a difference that is significant at 1 percent. There is no significant difference in international sales shares. However, ethnic-diverse firms are also significantly less plugged into UK markets than are more homogeneous firms, with more than 5.7 percentage points fewer sales (significant at 1 percent).

¹⁶ Specifically, the Breusch-Pagan error independence test always gives a test statistic of more than 2,800. The null hypothesis is that the standard errors in the 3 equations are not correlated, and SUR is identical to OLS. Our result suggests substantial efficiency gains, so that SUR is the preferred specification. OLS results have similar point estimates but much larger standard errors.

The results suggest that the market orientation of management-diverse and migrant-headed firms in London is markedly different from that of UK-run or ethnically homogeneous companies. For ethnically diverse firms, the capital's large and cosmopolitan home markets are an important source of revenue. For firms with migrant owners and partners, international markets matter, suggesting that diasporic links (and connectivity) are in play. London's home markets and international accessibility play bigger roles in sales than do markets in the rest of the United Kingdom.

Formation of Firms

386 Our third set of results looks at migrant entrepreneurship, specifically at whether migrant status has any links to reasons for founding firms. The literature suggests that rates of migrants formation of firms may be higher than for the general population, but differs on whether this entrepreneurial activity reflects the proactive identification of new opportunities or reactive responses to the lack of opportunity. To test these two channels, we regressed the reasons for forming firms on migrant status, management ability, and migrant-ability interaction terms. For firm i in sector j and year t , we estimated:

$$\Pr(Y_{ijt} = 1) = aMIG_{ijt} + MGT_{ijt}b + MIG * MGT_{ijt}c + S_j + T_t + e_i, \quad (3)$$

where Y indicates proactive, reactive, or other reasons for forming firms. We fit the model as a conditional logit with year and SIC3 dummy variables. The results are given in Table 9. The results are indicative of positive selection via migrant entrepreneurship: being a migrant raises the possibility of the proactively motivated formation of firms, has no significant link to reactive motivations, and has a marginally significant link to other motivations.

Overall, these results suggest that the positive selection by individual migrants plays some role in the formation of firms, which is likely to be beneficial to the city's economy. Of course, we did not observe individuals prior to the formation of firms, so we do not interpret these results as causal.

Checks for Robustness

We ran three checks on our results: isolating the management-diversity channel, testing whether migrant entrepreneurs explain firm-level outcomes, and exploring firm-level endogeneity.

Management or Workforce Diversity?

We chose to focus on management diversity in firms because senior members of staff are more likely to make key decisions and to be founders of firms. Nonetheless, since we did not explicitly control for wider workforce demographics, our results may actually reflect omitted workers' characteristics. To test for this possibility we made use of LABS data for 2007, which include information on the ethnic mix of the workforce as well as the characteristics of owners/partners.

First, pairwise correlations of management and workforce diversity variables are low (typically between 0.1 and 0.2), suggesting that we identified distinct characteristics of firms. Second, we reran regressions for innovation, commercialization, and sales orientation for the 2007 cross section, including a fractionalization index of workforce ethnic groups alongside variables for migrant and ethnic diversity at the senior level. The results are available on request. In each case, including the workforce variables reduced the point estimates of the management diversity coefficients, but did not change the

significance level. This finding suggests that management diversity has an independent link to business outcomes over and above the characteristics of the workforce.

Individual Selection Bias

The section on firm formation suggests some links between migrant status and entrepreneurial behavior, at least for the reasons for the formation of firms. If migrant (and minority ethnic) business founders are entrepreneurial in a broader sense, their presence may also explain our firm-level innovation and sales orientation results. If this is the case, coefficients of DIV in our main results will be biased upward. By contrast, negative selection may explain the lack of connection between diversity and measures of commercialization. If migrant and minority owners/partners face discrimination in marketing new ideas, estimates of DIV would be biased downward.

To test this selection bias issue, we substituted the proactive and reactive entrepreneurship dummy variables for DIV in equations (1) and (2), for innovation/commercialization and sales orientation respectively (“other” founders were the reference category). Overall, we found only one marginally significant result (available on request). We conclude that individual migrant entrepreneurs do not explain firms’ outcomes.

Firm-level Endogeneity

Our models in (1) and (2) may also be affected by reverse and/or both-ways causation. For example, if firm-level diversity facilitates innovation, managers in innovative firms may also seek or attract a more diverse top team. Similarly, managers may seek to exploit international market openings by recruiting a diverse mix of owners/partners. If they do, the coefficients of DIV will likely be biased upward, because firms exploit positive diversity effects.¹⁷

To deal with this issue we needed to use instruments. Since LABS is cross sectional, using the historic behavior of firms is not an option. We experimented with sectoral approaches, exploiting the fact that migrants tend to cluster in certain industries; however, doing so did not allow us to identify ethnic diversity, and experimental instruments failed first-stage tests.¹⁸ Fortunately, our geocoded data on firms provided the basis for an alternative approach. Because some migrants and minority ethnic groups tend to cluster in certain neighborhoods over time (although this tendency varies by groups), it may influence the immediate pool of workers from which a firm currently recruits—without having any direct effect on innovation or citywide sales orientation. We therefore developed a simple shift-share instrument for ethnically diverse firms, building on

¹⁷ Downward bias may arise if less innovative firms have fewer opportunities to recruit from the mainstream labor market and recruit individuals—such as those from ethnic minorities or migrant groups—who face discrimination in the wider labor market. Evidence from the literature suggests that this possibility is less likely than upward bias, which we take as our main endogeneity problem at the firm level.

¹⁸ The results are available on request. Alternative instruments include (1) a shift-share instrument based on Ottaviano and Peri (2006), which generates predicted ethnic/migrant shares, based on 2003 data and changes in London’s population over the period 2003–07; (2) an interaction term between borough-level diversity in 2001 and diversity at the firm or sectoral level; and (3) collapsing the data to sector/borough averages for 2007 and using the lagged values for sector/borough diversity in 2003. We also experimented with a synthetic panel at sector/borough level, following the approach of Angrist (1991) and Deaton (1985). In practice finding a suitable grouping variable proved difficult, and the final panel was not stable enough to provide reliable results.

Table 10
Instrumental Variables Results for Innovation and Commercialization, 2007

Innovation	First Stage	New Product, Service	Modified Product, Service	New Equipment	New Way of Working
Ethnic-diverse firm		-0.098 (0.224)	0.010 (0.220)	0.257 (0.214)	0.465** (0.232)
P(DIV)	0.353*** (0.066)				
Controls	Y	Y	Y	Y	Y
Observations	1496	1496	1496	1496	1496
Centered R2	0.073	0.068	0.070	0.012	-0.056
F statistic	7.092	8.941	7.813	4.151	6.420

Commercialization	First Stage	New Product, Service	Modified Product, Service	New Equipment	New Way of Working
Ethnic-diverse firm		0.141 (0.199)	0.224 (0.195)	0.323* (0.187)	0.426** (0.207)
P(DIV)	0.353*** (0.066)				
Controls	Y	Y	Y	Y	Y
Observations	1496	1496	1496	1496	1496
Centered R2	0.073	0.052	0.027	-0.046	-0.087
F statistic	7.092	6.507	5.972	2.664	4.006

Source: LABS.

Notes: Sample is for 2007 only. All specifications use robust standard errors and include partialled-out sic3 dummy variables. Controls as in main regressions.

* = significant at 10 percent, ** 5 percent, *** 1 percent.

 Results for additional first-stage robustness checks: (1) Angrist-Pischke excluded instruments weak identification test: $F = 31.13$ (0.000). (2) Anderson-Rubin Wald tests for weak-instrument-robust inference: F test (1,1374) = 0.18 (0.6735), $\chi^2(1) = 0.19$ (0.6602). (3) Angrist-Pischke underidentification test: $\chi^2(1) = 29.016$ (0.000). (4) Hansen J statistic overidentification test: 0.000 (0.000). For the Angrist-Pischke weak instruments test, the relevant Stock-Yogo 10 percent critical value is 16.38.

methods pioneered by Card (2001) and others. For firm i in borough j and year t , the instrument takes the form:

$$pDIV_{ijt} = DIV_{jtbase} \quad (4)$$

Here t is 2007 and $tbase$ is 2001, with shares of the historic borough-level minority ethnic population drawn from the 2001 census. We estimated in 2SLS with robust standard errors to obtain consistent estimates.

The first-stage results for innovation and commercialization are given in the first panel of Table 10, with robustness checks reported below the table. The R^2 from the instrument was low, but F tests and other tests were satisfactory. The second-stage results are given in the second panel. Coefficients of DIV were always positive; only three significant results survived from the main analysis.

Table 11 presents first- and second-stage results for sales orientation. Once again, the instrument passed the first-stage tests, although in this case, weak-instrument-inference robust tests were not passed. In this case, the overall pattern of the IV regressions was the same as the main results (although a couple of coefficients blew up, probably reflecting the first stage R^2 score).

Table II

Instrumental Variables Results for Sales Orientation, 2007

	First Stage	Local Market Share	National Market Share	International Market Share
Ethnic-diverse firm		58.326*** (17.463)	-57.809*** (17.021)	-0.400 (6.035)
p(DIV)	0.345*** (0.067)			
Controls	Y	Y	Y	Y
Observations	1461	1461	1460	1461
Centered R2	0.072	-0.166	-0.511	0.447
F statistic	6.902	20.841	3.243	22.984

Source: LABS.

Notes: Sample is for 2007 only. All specifications use robust standard errors and include partialled-out sic3 dummy variables. Controls as in main the regressions.

* = significant at 10 percent, ** 5 percent, *** 1 percent.

Results for additional first-stage robustness checks: (1) Angrist-Pischke excluded instruments weak identification test: $F = 26.82$ (0.000). (2) Anderson-Rubin Wald tests for weak-instrument-robust inference: F test (1,1339) = 16.95 (0.0000), $\chi^2(1) = 18.49$ (0.0000). (3) Angrist-Pischke under-identification test: $\chi^2(1) = 29.26$ (0.000). (4) Hansen J statistic overidentification test: 0.000 (0.000). For the Angrist-Pischke weak instruments test, the relevant Stock-Yogo 10 percent critical value is 16.38.

Overall, the results suggest that substantial firm-level endogeneity is present in our main results. However, an IV analysis is possible only for one year of data, and we lost a great deal of precision by substituting dummy variables with continuous variables. More seriously, while the instrument met the exclusion condition, it barely passed the relevance condition. The cautious conclusion is that endogeneity is present, which biases DIV upward, and thus the main results are interpreted as bounds, not point estimates.

Conclusion

This article has investigated whether London's cultural diversity helps or hinders the performance of London firms. The analysis focused on the role of migrant and minority business owners/partners using a survey of more than 7,600 firms in 2005–07. This period coincided with a major diversity-related policy shock in London, allowing us to explore potential links to business performance against a backdrop of growing superdiversity. As far as we are aware, this is the first study to look econometrically at aspects of cultural diversity in firms in an urban context. The findings build on qualitative work in this area (Sepulveda et al. 2011; Smallbone et al., 2010; Kitching et al. 2009), help illuminate the ways in which migrants, minorities, and diversity influence economic outcomes for firms; and highlight some important consequences of London's striking recent demographic shifts.

We found evidence of a small but significant diversity bonus across innovation, market orientation, and entrepreneurship. First, the diversity of the management team has a small but robust link to the development and implementation of major new products. Migrant-run firms are more likely to introduce major process innovations. Second, whereas previous research suggested that diversity effects may be restricted to knowledge-intensive environments, we found diversity-innovation links across London's industrial structure. Links appear more common in less knowledge-intensive sectors. This finding suggests that the diversity bonus in London firms is often manifest more in ordinary sectors than in high value-added activities.

Third, diverse businesses are more oriented toward London's large and diverse home markets (for ethnic-diverse firms) and markets in the rest of the world (migrant firms). These results highlight the importance of both diasporic links and local embeddedness and suggest that the effect of migrant diversity and ethnic diversity differs. Finally, we found small but robust links between migrant status and the formation of proactive firms.

We found little connection between diversity and the successful commercialization of ideas. One explanation is simply that diverse firms produce new ideas that fail in the marketplace. A second is that diverse firms find it harder to bring their products to market, which suggests coordination failures around antidiscrimination, business support, access to finance, and workforce development. Certainly, the reality of London's superdiversity has only just begun to be reflected in policy practice; see Sepulveda et al. (2011). A third is that our measure of commercialization may be too restrictive to capture the benefits of innovation. Many new ideas take time to commercialize successfully, particularly for knowledge-based firms in which idea-market-revenue lags may run to several years. Given London's knowledge-focused industrial structure, slow commercialization may explain some of the gap. Better data on London firms, ideally a true

390 panel, would also help to resolve this issue.

There are some important caveats to our findings. First, our measures of cultural diversity inevitably understate the true richness of the capital's population. Second, although we were able to control for several endogeneity issues, we were unable to deal fully with potential firm-level simultaneity in our results. Simultaneity is likely to have biased our estimates upward, so caution suggests that the results should be interpreted as bounds. Third, we were unable to explore management and workforce-level channels or connections to international markets in as much detail as we would have liked. Future research could productively pursue all these areas.

Our findings also inform wider debates about the pros and cons of difference. Our results could provide an economic rationale for proponents of multicultural cities; equally, they suggest that some discrimination and constraints may persist for migrants and minority communities, even in cosmopolitan cities like London.

It is also less clear whether our results generalize to different cities. In theory, we might find similar results for firms in other large UK cities. But London's size, economic structure, and demography are unique, and we should be careful in applying these findings. The findings could be replicated in other big British cities—such as Liverpool, Manchester, Glasgow, or Birmingham—but the links may be smaller or driven by other channels. Furthermore, comparative research would help isolate any London-level effects and establish the wider benefits and costs of diversity and difference.

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