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# Cities on and off the map: A bibliometric assessment of urban globalisation research

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## Abstract

Growing out of writings on Global (North) cities, urban globalisation research (UGR) has expanded its canon to engage with an increasing diversity of cities and locations. Yet, this broadening has been uneven and controversial in its theoretical horizons and empirical universe. Focusing on the latter, this paper combines bibliometric, demographic, economic and georeferenced data to assess how UGR maps onto internationally documented cities (n: 1692). Our study analyses city-themed publications by city location, demographic size and home-country income (2000–2014). Drawing on social science publications indexed in English (Scopus database), our results provide grounds for cautious optimism: recent publications offer broader, though still uneven coverage. The moving spatial average of publication counts also implies that the topical centre of published research gravity is shifting away from Euro-America. Yet, UGR lags in its coverage of the urban geographical universe, failing to keep pace with the economic/demographic trends that are resulting in southward/eastward shifts in worldwide urbanisation. Furthermore, while smaller cities and those in lower-income countries are still sidelined, cities in upper-middle income countries exhibit the largest gaps between observed and expected publication values. In our conclusion, we contend that urban bibliometrics could be further mobilised to identify publication foci and lacunae. Applied to cities on and off the map and a broader universe of urban knowledges, bibliometrics could help move contentious debates forward, identifying newer paradigms that may be engaging the world of cities beyond the globalisation umbrella and charting out multiple and complex topical relations across variegated worlds of urbanism.

## Keywords

bibliometrics, cosmopolitanism, globalisation, ordinary cities, urbanisation

## Introduction

Scholarship on urbanization has been flourishing worldwide, with a conspicuous growth in academic centres, programs and international conferences and workshops, a development which may enrich urban globalization research (UGR) literature. The field developed out of diverse analytical writings on global (North) cities in the 1980s and 90s, describing how cities are incorporated into and experience globalization processes such as increased interconnectivity and heightened interdependency from multiple locations and relative positions. However, the ongoing broadening of the UGR canon has attracted controversy for both its theoretical implications and its methodology and empirical substance. It therefore seems sensible to take stock of the universe of cities underpinning UGR.

In this paper, we probe the critique that UGR still reflects restricted geographical participation in knowledge production. The paper mobilizes bibliometrics to identify publication foci and lacunae in the literature, it charts out the evolution of UGR publications in the early twenty-first century to assess the cities that are on and off the literature's topical map. Our findings show that, while UGR has progressively broadened its engagement with the world of cities, its coverage remains uneven and partial. Furthermore, a comparison with the larger set of all urban-themed publications revealed that the broad thrust of urban studies has shifted more definitively in the types and locations of cities that are published about. We conclude by explaining why we remain cautiously optimistic, despite the unevenness of this progress, which appears particularly sluggish by comparison with economic and demographic trends towards southward/eastward shifts in worldwide urbanization. While the social-science focus of this preliminary research does not cover the entire universe of urban knowledges, which should also encompass the applied sciences, it provides a useful starting point for assessing UGR's geographical foci and empirical boundaries. In addition, findings from 'negative' bibliometric

results (cities that remain off the map) could spur new conversations across worlds of urbanism and productive encounters between UGR and urbanist traditions that may not yet be represented in ‘international’ publication databases.

Our paper is divided into three sections and a conclusion. In the first section, we review debates related to UGR’s expansion. We engage with discussions on the evolution of the ‘globalization’ paradigm within urban studies; briefly review on-going theoretical controversies as to the canon’s degree of inclusivity; and then focus on how much more inclusive UGR has actually become, both in terms of the conditions and the locations of cities studied. The second section outlines how bibliometrics can map out unevenly globalized landscapes of knowledge such as UGR. The section also provides a methodological note on our keyword-based bibliometric data which provides publication counts for documented cities (n: 1,692) for the 2000-2014 period. We list our methods (tabulations, mapping, calculation of spatial statistics, chi-square tests) and data sources. The third section summarizes and interprets our empirical findings on how the globalization paradigm has fared within urban research, and on the complex relationships between city-themed publication counts and the characteristics and locations of actual cities. We conclude with suggestions for future bibliometric research. We posit that, despite limitations of scope, our assessment of social science publications indexed in English in the Scopus database may help move the discourse beyond unproductive skirmishes; shed a clearer light on the planes on which empirical research and generalization efforts are operating; and promote dialogues across worlds of urbanism by stimulating inquiries into the ways in which the map of urban publications in local outlets and grey literatures may or may not differ from the international UGR literature captured in Scopus (though a full discussion of this is clearly beyond the scope of this preliminary research): all in the hopes of ultimately contributing

towards a more epistemologically-inclusive and empirically-informed research agenda by identifying, and reflecting on, which cities are currently (not) being discussed.

### **Demarcating the Debate: Broadening the globalization paradigm or disavowing it?**

UGR has become a well-established field within urban studies (Paddison 2001; Williams 2012). Interest in cities of the global South now shapes UGR, alongside on-going studies on so-called global cities (Parnell and Oldfield, 2014; Davis, 2006; Gandy, 2006; Zeiderman, 2016; Keil and Brenner, 2006; Grant and Nijman, 2002). Previously neglected areas, such as African urbanism (Grant, 2015; Parnell and Pieterse, 2014; Myers, 2011; Pieterse, 2008; Obeng-Odoom, 2010), are receiving attention and innovative comparisons – such as planetary gentrification (Lees, Shin and López-Morales 2016) – have gained centrality. Nevertheless, thorny controversies have beset this expansion, which potentially overstretches concepts (see van Meeteren et al., 2016a). Critics of the latest research suggest that researchers may in fact have disavowed the globalization paradigm and substituted comparative empiricism for theory. This section briefly revisits that debate, before turning to our main analytical concern: exactly how much more empirically inclusive UGR has become, when we consider the published research and its topical coverage and neglect of specific cities.

#### *The Cosmopolitan Turn in the Social Sciences and the Broadening of UGR*

Social sciences have turned to cosmopolitanism, moving beyond the Eurocentrism of modernization/development theory and nation-state-centric frameworks in which countries were believed to ‘contain’ society (Beck, 2000; Appadurai, 2000; Soja, 2000; Kramsch, 2007). Similarly, UGR studies now look beyond world/global cities to analyse complex, uneven worldwide urbanization processes (Soja and Kanai, 2007; Clark, 2003; Brenner, 1999).

Anticipating this ‘third wave of urban global research,’ Machimura (2003, p. 957) was one of the first commentators to notice the diversification away from economic accounts of command-and-control centres in transnationally networked configurations. Researchers now draw on multiple theoretical perspectives, including postcolonial and subaltern studies (Roy, 2009; King, 1990), in order to engage the ‘world of cities’ more thoroughly – drawing particular attention to ‘cities off the map’ (Robinson, 2002). Their pluralist theoretical perspectives range from poststructuralism (including assemblage urbanism and feminist psychoanalysis) to ethno-methodology, and engage ‘new geographies of theory’ (Roy, 2009), while also exploring how multiple non-elite actors *world cities* (Roy and Ong, 2011; Simone, 2009; Varley, 2013; Gough, 2013; McFarlane, 2008; Mbembe and Nutall, 2004; Kanai and Oliveira, 2014; Manalansan, 2015). In addition, experimental comparative methods have mobilized Southern theories to explore Northern phenomena, using innovative pairings and reversed explanatory directions (Myers, 2014; Schindler, 2014).

### *Theoretical Controversies*

The broadening of UGR has attracted controversy. Smith (2013) objects to the study of urban globalization beyond clearly identifiable command-and-control centres with ‘global city’ functions, while Scott and Storper (2014: 12) describe the latest waves of research as “radically incomplete.” They argue that the literature lacks universality and higher levels of theoretical generalization. Furthermore, while tacitly accepting the charge of geographical elitism, they dismiss its implications, concluding that “outright iconoclasm cannot be justified solely ... on the grounds that existing geographies are founded on a limited ‘repertoire of cities’ that excludes this or that form of empirical variation.” Adopting a conciliatory position, Peck (2015: 162) proposes integrating emerging research and its broadened canon into established critical perspectives, such

as political economy research on globalized neoliberal urbanism, thereby avoiding to “underestimate[ing] pan-urban pressures, tendencies, patterns and the reworked matrices of globalized power.” The debate is far from settled, however. A new wave of responses counter these arguments (Roy, 2016; Robinson, 2016a) and critiques of the critiques appear to be growing increasingly contentious (Leitner and Sheppard, 2016). While the full extent of these arguments and counterarguments exceeds the scope of this paper, it is important to note that they have been entwined with critiques of the methodological and empirical inclusivity of contemporary UGR, a question which bibliometric studies such as this one can address more directly.

#### *A More Inclusive Engagement with the World of Cities?*

There is disagreement as to UGR’s precise empirical and methodological boundaries. For Robinson (2016b: 4) “[t]here is much work under way ... which is establishing a more global urban studies.” Similarly, Leitner and Sheppard (2016) argue that unprecedented rates of urbanization worldwide have facilitated this shift by fostering regionally-based research programs with diverse urban theorizations. However, not everyone agrees on the actual scholarly impact of this ‘shifting ecosystem of critical urban theories’. Nijman (2014; p. 184) claims that a limited number of ‘westerners’ continue to dominate UGR, asking provocatively “[h]ow much empirical work is actually done on places in a comparative fashion or, for that matter, on hundreds of other cities and urbanizing places away from North America and Europe?”

Furthermore, even if the literature has come to reflect the ‘southern’ and ‘beyond the West’ perspectives that scholars such as Watson (2014, 2009), McFarlane (2008) and others (Amin 2004; Pieterse, 2009; Simone, 2009; Sheppard, Leitner and Maringati, 2014; Rao 2008)

have long demanded, it is unclear whether UGR is now less centred on the most conspicuous world/global cities and megacities, or whether studies continue to overlook smaller cities (Bell and Jayne, 1999, 2006), and only a handful of studies are dedicated to the dynamic secondary and mid-sized cities (Chen and Kanna, 2012). Bunnell and Maringanti's (2010) concept of 'metrocentricity' critiques the global and regional trend in biasing publication towards larger and wealthier cities. Birch and Wachter (2011) explain that megacities represent only a fraction of urban population worldwide, a proportion dwarfed by that of the more numerous small/medium cities. Publication bias may also reflect a city's wealth and its country's income. For example, Visser and Rogerson (2014) indicate strong distributional biases occurring within Sub-Saharan Africa, where published research is overwhelmingly concerned with specific cities, such as Cape Town – this even to the expense of Johannesburg, a far more economically powerful city and international immigration hub. Publication frequency also matters. Some cities may not be receiving sustained research attention, while publications on others abound. Those with low publication frequency may be treated as counterfactuals or anomalous outliers, while frequently-studied cities, which still dominate discourse, are conferred with paradigmatic status (McFarlane, 2010; Beauregard, 2003; Nijman, 2004).

Therefore, our study proposes the first bibliometric assessment of UGR's broadening scope in the light of the critiques reviewed above, and to examine the place of 'globalization' within contemporary urban studies worldwide. The following section explains the geo-referenced, keyword-based bibliometric method used to show how city-themed publication counts allow us to ascertain how well UGR, and the social-science urban research that contains it as a sub-field, reflect shifts in worldwide urbanization. We will also discuss caveats and limitations to our work.

## **Bibliometrics for the Critical Appraisal of UGR**

The UGR debates reviewed above rarely draw on bibliometrics. However, the technique can serve critical urban research well. We believe that the use of bibliometrics need not be confined to the creation of pernicious hierarchical distinctions among academics, which we are aware that result in homogenization and exclusion. Studies have mobilized bibliometrics to chart unevenly globalized landscapes of knowledge production; draw attention to biases; inform future research programs; and provide literature overviews (Paasi, 2005; van Meeteren et al., 2016b). Ecologists Martin, Blossey and Ellis (2012) use bibliometrics to demonstrate site selection bias which results in the oversampling of protected areas. Such concerns resonate with UGR and cognate urban fields with tight links between observed sites and produced knowledge. We propose using bibliometrics to probe referenced-city publication bias, in which cities of certain types/locations receive a disproportionate amount of research attention.

### *Bibliometric Assessment of UGR Publications*

The previous section showed that UGR is suspected of bias. Bibliometrics could provide more systematic analyses of UGR on a global scale and over a longer time-period. Previous bibliometric studies applied to globalization debates and urban research have focused on general parameters rather than city-specific coverage differentials. A survey of globalization literature from 1990-2009 shows that cities constitute an important publication focus (Liu, Hong and Liu, 2012). The discipline of geography is a major contributor, although ‘globalization’ is also discussed by a variety of disciplines with divergent conceptualizations (ibid.). Urban research publications are also unevenly distributed worldwide. Using countries as their geographical units of analysis, Wang et al. (2012) identify the United States as the dominant research powerhouse,

with China emerging as a secondary hotspot. They also note the over-representation of countries with high economic growth and urbanization rates (although underlying processes and patterns differ across countries).

By shifting the analytical focus to publication content (cities mentioned substantially in published research) rather than the locations where urban knowledge is produced, we hope to use bibliometric techniques to help advance debates in UGR, which have remained more or less speculative and would benefit from evidence-based arguments. Rather than focusing on a single ‘urban’ discipline (such as geography) or set of thematic journals (such as urban studies and planning journals), the study includes all database publications in the social sciences, where ‘globalization’ debates have been most intense (Liu, Hong and Liu, 2012).

Our approach has its limitations. Social sciences represent only one discrete segment within the universe of urban knowledges. Our results would probably have differed if we had analysed ‘applied sciences’ (Kamalski and Kirby, 2012). Moreover, our keyword-based analysis excludes longstanding alternative conceptualizations of the ‘global’ (such as Lefèbvre’s (1973) concept of *le mondial*, ‘the worldwide’), as well as work seldom published in international journals in (or indexed in) English. Multicultural critiques of Anglo-American hegemony in academic publishing and peer-reviewing abound (Aalbers and Rossi, 2006; Bajerski, 2011). Mather (2007) argues that the spatial division of knowledge production imposes heavier burdens on global South researchers, who are expected to demonstrate the relevance of their work beyond their home country/region. Nevertheless, analysing UGR’s relative position within the broader constellation of ‘urban’ publications in the social sciences can provide important insights into both the literature’s limitations and its evolution. We examine publication distributions longitudinally over a fifteen-year period. This preliminary assessment of twenty-first century

UGR therefore constitutes a necessary step towards the production of less fragmentary urban global knowledge and may foster dialogue across different worlds of urbanism.

### *Methodological Specification*

Our study involves keyword-based bibliometric analysis of ‘urban’ themed social science publications and a focal subset of ‘urban global’ themed publications from the early twenty-first century (2000-2014). We selected publications with the terms ‘urban’ and ‘global’ in either their titles, keywords or abstracts – attaching the ‘\*’ operator to both terms to capture all possible suffix variations. We counted the number of annual publications in the urban set and urban global subset and then carried out an automated batch search, using world city names as third keyword ([urban\*] + [global\*] + [city name]). This produced publication counts – in both set and subset – for each city. We defined a publication as substantially focused on a city if it referred to said city in either the publication title, keywords or abstract. This allowed us to measure the level of city-specific UGR and urban ‘research attention’ over time. We did not consider a city’s appearance in the main body of a publication as sufficient evidence of substantial research attention. Each publication can be referenced to one or more cities (provided they all appear in the publication’s title, keywords or abstract). We then analysed the geographical distribution (by geo-referencing city names on a world map) and relative frequency of publication counts. Finally, we used locational, demographic and economic data to classify more/less studied cities.

The analysis was based on simple cross-tabulations, easily interpretable maps, and a few less intuitive statistical analyses, including spatial statistics (weighted spatial mean) and the chi-square test of independence. We used these to strengthen our overall results, although our arguments may also be interpreted without reference to quantitative evidence. Using the

weighted spatial mean on a global scale can be particularly complex and arbitrary (Yuill, 1987). Following Mulligan and Crampton (2005: 367), we were not primarily concerned with mapping our calculated coordinates onto exact locations (or positing whether the central point fell at a specific world location). Instead, we monitored distributional shifts and tested possible mismatches between the overall spatial distribution of the world's urban population and that of published urban research over time. In other words, we investigated how well the literature's geography aligns with that of worldwide urbanization. We cross-tabulated demographic size and country income and used chi-square tests of independence, a basic social science tool, to assess research biases in publication frequency (Martin, Blossey and Ellis, 2012).

Publication counts were obtained from the Scopus database for the social sciences. Norris and Oppenheim (2007) report stable bibliometrics across available databases (Scopus, Web of Science and Google Scholar), but Scopus has specific advantages in terms of functionality and social-science coverage. We obtained city names, populations and geographical coordinates from the United Nations Population Division's 2014 Revision of World Urbanization Prospects (n: 1,692). Adapting Birch and Wachter's (2011) city classification by demographic size, we distinguished between five categories of cities: megacities of more than 10 million; large cities of 5-10 million; medium cities of 1-5 million; small cities of under 1 million; and even smaller cities of under 500,000 (not included in Birch and Wachter). For home country income, we used data and classifications from the World Bank's World Development Indicators, which distinguish between high-income OECD, high-income non-OECD, upper-middle income, lower-middle income and low-income countries. We defined "sustained publication activity" leniently as a minimum of one average annual publication per study period, which we sub-divided into three five-year ranges to coincide with the available demographic data (2000, 2005, 2010). Five-

year spans provide sufficient time to assess shifts in publication activity while avoiding the instability of year-by-year counts.

### **What Bibliometrics Show: Implications for UGR**

This section contains our main findings; reports trends within the UGR subset and the broader field of social-science urban studies; assesses relative frequencies over the course of our study period; and charts the trajectories and characteristics of individual cities (locational, demographic and economic). Results suggest a sluggish and uneven expansion. In fact, decentring away from Euro-America may have been largely caused by an increase in urban research on the Asian Pacific region in general and China in particular. Smaller cities and those in lower income economies still receive far less attention, while cities in upper-middle income countries exhibit the widest gap between expected and actual publication counts. We are optimistic about UGR, however, given publication growth and its continued relative importance within urban studies. However, there are indications that the literature lags the broader urban field in its engagement with the world of cities (beyond a relatively few select centres). This raises doubts about the future relevance of UGR in a thoroughly urban world.

#### *Globalization still relevant to today's urban world*

Judging by publication activity, globalization remains a vibrant, but by no means dominant, urban studies focus. Yearly publications increased by 458% between 2000 and 2014. This may partly reflect improved database coverage (decreasing attrition over time), but it is still striking that the growth rate outpaces that of the entire urban field (331%). Globalization's yearly share of all urban research publications showed a modest growth of 2.1 percentage points, and UGR was still at 9.1% of total publications by 2014. These figures need to be interpreted with

caution, since yearly growth rates display instability – 2005 had a zero growth rate, and 2014 a negative rate. Yet overall growth suggests that interest in globalization did not peak in the 1990s. The paradigm is yet to become *passé* (Liu, Hong and Liu, 2012). Future studies should, however, analyse rate variation geographically: in the United States, the world’s main producer of urban research, the globalization paradigm remains less influential (Kirby, 2013; Wang et al., 2012).

### *The Shifting World Urban Centres of Population and Publication Gravity*

UGR is not responding promptly to shifts in worldwide urbanization and may become more Euro(America)-centric than urban studies as a whole in the near future. There is no clear evidence of increased attention to global South cities at the top end of publications distribution. Table 1 shows the twenty most studied cities in the three five-year periods. Unsurprisingly, New York and London continue to receive the most scholarly attention. The table also shows the rise and consolidation of China and the Asia Pacific region as prominent topical foci for UGR. Beijing’s rise in popularity is especially noticeable. Shanghai, Hong Kong, Singapore and Guangzhou have also attracted increased attention and Tokyo remains at a high position, despite a relative decline in publication frequency. Meanwhile, North America and Europe (NAE) have maintained their level of representation (with four cities each on the most recent list of top countries).

Research from other regions remains sparse. Africa-based research is conspicuously absent, following Johannesburg’s drop from the charts – as is Latin American research, following the disappearance of Mexico City from the rankings. The table provides a column with population-based rankings for each interval (with a one-year delay). Among various identifiable contrasts, we should note that, by 2015, there were six cities in Asia (Osaka, Dhaka, Karachi, Kolkata, Chongqin and Manila); four in Latin America (São Paulo, Mexico City, Buenos Aires

and Rio de Janeiro); and two in Africa (Cairo and Lagos), which were not as frequently studied from a UGR perspective, despite their large demographics. Finally, not all cities which initially came under the world and global city umbrella have continued to garner high levels of attention. Frankfurt, for instance, is conspicuously absent, even though this financial capital was once listed in the upper echelons of world city rankings (Beaverstock, Smith and Taylor, 1999).

[INSERT TABLE 1 HERE]

The urban population columns in Table 1 provide an initial indication that worldwide urbanization has increasingly resulted in peaks of metropolitan demographic concentration outside NAE. This geographical shift is even more evident when the list is expanded to include all the world megacities (29) and large cities (44) registered in the 2015 dataset. A more comprehensive methodology is required to account for the rapid growth and expansion of mid-sized and smaller cities in the world geography of urbanization. We have therefore replicated Mulligan and Crampton's (2005) calculation of the *world's urban centre of demographic gravity* based on the location and population of the world's cities (our results vary slightly from theirs since our calculations were based on an updated and enlarged dataset). We found on-going shifts in a southeasterly direction, consistent with the trend identified by Mulligan and Crampton (ibid.).

We calculated the *world's topical urban centre of research gravity*, substituting population for publication count data. The results, displayed in Table 2, indicate that while the weighted spatial mean is moving eastward and southward, urban research lags demographic trends. We recalculated the spatial mean for UGR, using publication counts only, and found that that subset adjusts even more slowly to shifts in the spatial distribution of the world's urban

demographics. Due to their different starting points, UGR's centre of gravity is still located to the east and south of its counterpart in the broader urban field.

The differences in their respective trends, however, suggest that their relative locations may soon be switched. Emerging research on worldwide urbanization may be circumventing the 'globalization' paradigm in its attempt to engage the world of cities more comprehensively. Studies of worldwide urbanization, now also understood through the planetary urbanization perspective, may be increasingly eschewing 'global' processes as explanatory factors. Research on Southern urbanisms, in particular, includes prominent alternative perspectives to globalization such as post-coloniality and worldings from below. UGR researchers may in turn be increasingly restricting themselves to a narrow range of topics within transnational finance and advanced producer services – and may risk losing sight of the broader contexts of urbanization which shape these economic dynamics (Smith, 2013). More research and in-depth text mining of publications is evidently needed to explore the implications of these initial findings. Such research is beyond the scope of this paper.

[INSERT TABLE 2 HERE]

#### *Most Cities are still off the Publication Map*

A decisive topical broadening is yet to occur. UGR continues to incorporate only a select range of locations. Our dataset consists of internationally-documented cities with a current population of over 300,000 (n: 1,692). We drew on the most reliable, comprehensive list of city populations, widely used by researchers (Montgomery and Balk, 2011). Yet the dataset includes fewer than half of the almost 4,000 cities with a reported minimum population of 100,000 (Angel, 2012: 3), which if included would likely exhibit even higher publication selectivity.

UGR is selective in its engagement with actually existing cities. In addition, most cities featured received only sporadic publication attention. Only around one third of the sample cases registered a publication count larger than zero ( $n_{>0}$ : 574; 33.9%); and the majority of these cities were the subject of only sporadic publication activity ( $n_{1-15}$ : 503; 30% of total sample). Cities with a sustained level of dedicated publication activity (leniently defined as an average of more than one publication per year) accounted for less than 5% of the sample ( $n_{>15}$ : 71). The larger set of all urban-themed publications exhibited more extensive coverage, with almost 72% of cities receiving some publication attention ( $n_{>0}$ : 1,324), but only about one in five registered sustained publication activity ( $n_{>15}$ : 368).

There are grounds for optimism, however. Coverage of both the broader urban literature and the UGR subset improved over the fifteen-year study period. By 2004, the cumulative ratios stood at 38.4% and 12.3% and reached 56.4% and 22.3% respectively by 2009. Nevertheless, the distribution of UGR publication counts remains highly skewed. From 2009-2014, the sum of publication counts for the top twenty most published about cities (as listed in table 1) was 39% of the sum of publication counts for all 1,692 cities in the dataset. This raises the spectre of an urban bias reinforcement syndrome, i.e. cities might be studied because of extensive research on them in previous publications or because they feature in traditional scholarly work which appeared in the most influential and cited outlets.

We used chi-square analysis to evaluate differences in UGR publication frequencies across a) city size and b) (home country) economic development categories. Our results indicate significant associations for both cases ( $\chi^2_a$ : 839.433; df: 8; p-value <.001;  $\chi^2_b$ : 168.397; df: 8; p-value <.001). We looked at standardized residuals to further assess how these factors may influence publication frequencies for cities. Megacities had the highest positive residual (20.7)

within the category of cities with high publication frequency, with an actual count (24) which outnumbered the expected count (1.2) by a factor of twenty. Standardized residuals progressively decreased for large (9.7) and medium cities (3.1) and were negative for small (-4.5) and even smaller cities (-5.2) for which the actual count was zero – in other words, none of the 635 smallest cities with a current population of at least 300,000 received more than one average yearly UGR publication between 2000 and 2015 (even though the expected count would have been 27.4 had city size not been significantly associated with publication frequency).

Among country income groups, only cities in high income OECD member countries exhibited a positive standardized residual (5.9). The actual count (39) was more than double the expected count (15.7). Among all other groups with negative residuals, cities in upper-middle income countries (std. residual: -2.6) showed the widest gap between actual count (15) and expected count (29) within the high publication frequency group, although cities in low income countries were the only group to register a count of zero. These results indicate both total absences of research and lower than expected critical attention to cities in countries which have achieved considerable levels of economic development, accompanied by extensive urban expansion – the largest countries in the upper-middle income category include China, Brazil, Mexico, Turkey and Thailand. Chinese urbanization is a case in point. The potential implications of the country's fast-paced urban transformation for UGR have not been entirely ignored (Wu, 2016; Hsing, 2012). However, extant publications seem to have far from exhausted the resulting empirical richness and geographical diversity. We may be missing out on a learning dividend from the world's largest example of contemporary urbanization, and failing to tell numerous localized stories of contemporary urbanization processes in China and elsewhere.

Overall, while our mixed results provide grounds for cautious optimism, this is a key moment to reflect on UGR's unevenness and incompleteness. City-referenced bibliometrics do more than simply confirm how much more is known about the largest and most networked cities (Matthiesesen, Schwarz and Find 2010). The map in figure 1 depicts the vast world of cities which have not yet been the focus of social science urban publications. Clearly, internationally accessible research (with, at least, a title, abstract and keywords translated into English) still displays many knowledge deficits with regard to urbanization throughout the global South (and global East), despite the on-going cosmopolitan turn, and the possible broadening of research paradigms beyond narrowly construed economic globalization. Nevertheless, no publications made explicit reference to numerous cities in China (167), India (64), Russia (20), Mexico (14) and Nigeria (13), among others. Of these neglected cities, ten in China and ten in India had populations of above one million in 2015.

[INSERT FIGURE 1 HERE]

Furthermore, in the UGR subset, cities that have only attracted intermittent scholarly attention include Osaka (Japan); Karachi (Pakistan); Chongqing (China); Lagos (Nigeria); and Kinshasa (Democratic Republic of Congo), all of which had populations of over 10 million in 2015, but were the subject of no more than one average annual publication during the study period, which does not constitute sustained research attention. Cities such as Baghdad, Miami, Houston, Khartoum, Brasilia, Medellín, Changsha, Curitiba, Busan, Tijuana, Mecca, Panama City, Marseille and Dublin (in order of population) also failed to attract sustained scholarly interest, despite their clear implication in processes central to globalization, including migration; transportation and logistics; cultural production; world religion; and industrial and urbanist innovations; as well as violent conflict and transnational crime. The fact that such a low number

of UGR publications substantially engage with these cities is further indication of the field's overly narrow, reductive definition of globalization, in which advanced finance-driven capitalism is viewed as functioning in isolation from the indicators listed above.

When we aggregated this group of 'under-published' cities with populations of over a million by country, China (45), the United States (33), India (19), Brazil (13), Mexico (9), Nigeria (6), Pakistan (6), Japan (5), and Colombia, Indonesia, Morocco and Turkey (with 4 each) topped the list, a list not limited to the global South and which conspicuously includes the BRICs with their rapid economic growth and the MINT (Mexico, Indonesia, Nigeria, Turkey), as well as two of the world's wealthiest and most globalized countries. This is a further indicator that UGR's boundaries may have been too narrowly defined, side-lining numerous cities worldwide, including locations at the core of the global capitalist economy.

One final caveat: despite the research lacunae identified through bibliometric analysis, important urban knowledge *is* being produced in (and in relation to) locations off UGR's map. Therefore 'negative' bibliometric results should be interpreted as indicating incompleteness and perhaps our unawareness of the worlds of urbanism in which these neglected cities are embedded, and of the research traditions catering to their problematics, which may not be readily accessible in international publications indexed in English. Here too, bibliometrics could play an important role in the making of a more inclusive UGR: by highlighting problematic absences and helping formulate research agendas to remedy them.

### **Concluding Remarks**

This paper proposed using bibliometrics to assess the coverage and inclusivity of UGR. The literature's early twenty-first century expansion has been contested on theoretical and

methodological grounds, and appears to have had uneven empirical implications for the ways in which published studies have broadened their engagement with the world of cities. Furthermore, by comparing UGR's evolution with that of the broader field of urban studies within the social sciences, our study addressed the concern that the field may be operating under an economist paradigm of globalization that narrows the scope of empirical research, particularly in terms of locations studied, and may therefore result in increasing isolation from other perspectives on worldwide urbanization (Taylor and Derudder, 2016). This paper provides an evidence-based initial assessment of these shifts and demonstrates that bibliometrics can provide useful analytical tools to help delineate the unevenly broadened contours of UGR.

Our mixed findings suggest grounds for cautious optimism: they provide a nuanced response to the more severe accusations that UGR lacks inclusiveness. The literature is certainly diversifying its empirics, although perhaps too sluggishly, given the rapid shifts in worldwide urbanization. However, the paper's most significant findings are 'negative': they show how little we know about the world's cities, and hence about other worlds of urbanism which engage with worldwide urbanization processes from different perspectives and locations. If nothing else, these findings should highlight the need to continue to democratize global urban studies and reject a binary division between research-worthy world-class cities and others. First, however, we must acknowledge that our collective corpus of social science publications is neither as universal, nor as representative, as it ought to be.

Automated keyword-based bibliometric queries, as we argued above, can be applied to other realms of urban knowledge and to a broader set of questions. While our social science focus is far from all-encompassing, it provides a much needed starting point for further debates on globalization. Additional research will need to address the paradigm's apparent failure to

catch up with worldwide urbanization trends and tease out the extent to which ‘globalization’ is entering into a productive dialogue with emerging concepts of cosmopolitanism (and the decolonization of knowledge production); the analytical importance of apparently ‘ordinary cities’; and the arguably planetary extent of contemporary urban phenomena and extended relationalities (Amin and Graham, 1997; Robinson, 2006; Brenner and Schmidt, 2015, 2014; Merrifield, 2013; Kanai, 2014). We will also have to probe the argument that some of these other approaches may be missing a ‘context of contexts’ and ascertain what alternative explanatory notion, if any, they may be proposing in lieu of globalization (Brenner, Madden and Wachmuth, 2011). This will certainly also require close readings of pivotal works, to untangle theoretical dissonances and semantic overlaps, but further bibliometric analysis could help show how world location, demographic and economic characteristics interact to determine a city’s chances of receiving sustained research attention within different research paradigms.

Furthermore, bibliometrics could be applied to an even broader set of urban questions and to a comparison of social and applied science approaches. Future research foci might include: a) the relationship between publications on specific cities and those cities’ total urban knowledge production capacity (i.e. their institutions and researchers, the availability of resources and their funders’ priorities); b) geo-referenced analyses on an intra-urban scale, to probe possible site-selection biases within cities that may produce over and under studied neighbourhoods; c) the empirical specification of locational references beyond traditionally defined cities to empirically anchor planetary urbanization research; d) the tracking of urban knowledge mobilities including citation patterns, comparative multi-city research projects and collaborations and the direction of research agenda departures and arrivals within and across North-South and East-West divides; and e) text mining of urban publications to identify emerging topical research concerns

potentially linked to the specificities of certain cities that could travel/evolve from city to city providing generalized explanations – potentially drawing on innovative bibliometric applications in other fields (Meerow and Nuwell, 2015); and f) on-going vigilance regarding the inbuilt assumptions of bibliometric research, particularly when keyword based, and its tendency towards unreflexive participation in the geopolitics of English (Lacoste, 2004), and potential failure to question the geographical imaginations underlying forms of cosmopolitanism anchored in western thought, thereby missing opportunities to launch generative conversations across different worlds of urbanism and understandings of the urban that might engage difference in what Jazeel (2011) calls non-assimilatory terms.

We'd like to end on a note of optimism, however. While UGR may remain locationally selective and radically incomplete in its geographical coverage, it is expanding and evolving. We therefore see the glass as half full. UGR, and urban studies more generally, are moving towards increased pluralism and empirical inclusion of various kinds of cities worldwide. Yet if we are to consolidate comprehensive and robust explanatory paradigms in what may eventually become a post-globalisation urban studies, we will need a fulcrum which can sustain theoretical development, methodological innovation and empirical expansion. We believe that critical bibliometrics has earned its place within this research. We are looking forward to further studies illuminating both the emphases and silences of urban research.

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Table 1. Cities' Rankings by Metropolitan Population Size (2015) and Publication Counts (2000-14; 2000-4; 2005-9; 2010-4)

Ranking	Population (2015)	Urb.Glob.Pubs. (2000-2014)	Urb.Glob.Pubs. (200-2004)	Urb.Glob.Pubs. (2005-2009)	Urb.Glob.Pubs. (2010-2014)
1	Tokyo	New York	New York	New York	New York
2	Delhi	London	London	London	London
3	Shanghai	Shanghai	Tokyo	Shanghai	Beijing
4	São Paulo	Hong Kong	Mumbai	Hong Kong	Shanghai
5	Mumbai	Beijing	Singapore	Singapore	Hong Kong
6	Mexico City	Singapore	Hong Kong	Mexico City	Paris
7	Beijing	Mexico City	Mexico City	Beijing	Singapore
8	Osaka	Tokyo	Paris	Chicago	Mexico City
9	Cairo	Mumbai	Shanghai	Guangzhou	Toronto
10	New York	Paris	Los Angeles	Toronto	Istanbul
11	Dhaka	Toronto	Sydney	Los Angeles	Berlin
12	Karachi	Istanbul	Istanbul	Istanbul	Tokyo
13	Buenos Aires	Los Angeles	Beijing	Mumbai	Mumbai
14	Kolkata	Chicago	Toronto	São Paulo	Chicago
15	Istanbul	Guangzhou	Chicago	Tokyo	Los Angeles
16	Chongqing	Berlin	Berlin	Berlin	Guangzhou
17	Lagos	Sydney	Johannesburg	Sydney	Delhi
18	Manila	Barcelona	Santiago	Barcelona	Barcelona
19	Rio de Janeiro	Delhi	Guangzhou	Washington, D.C.	Dubai
20	Guangzhou	São Paulo	São Paulo	Johannesburg	Sydney

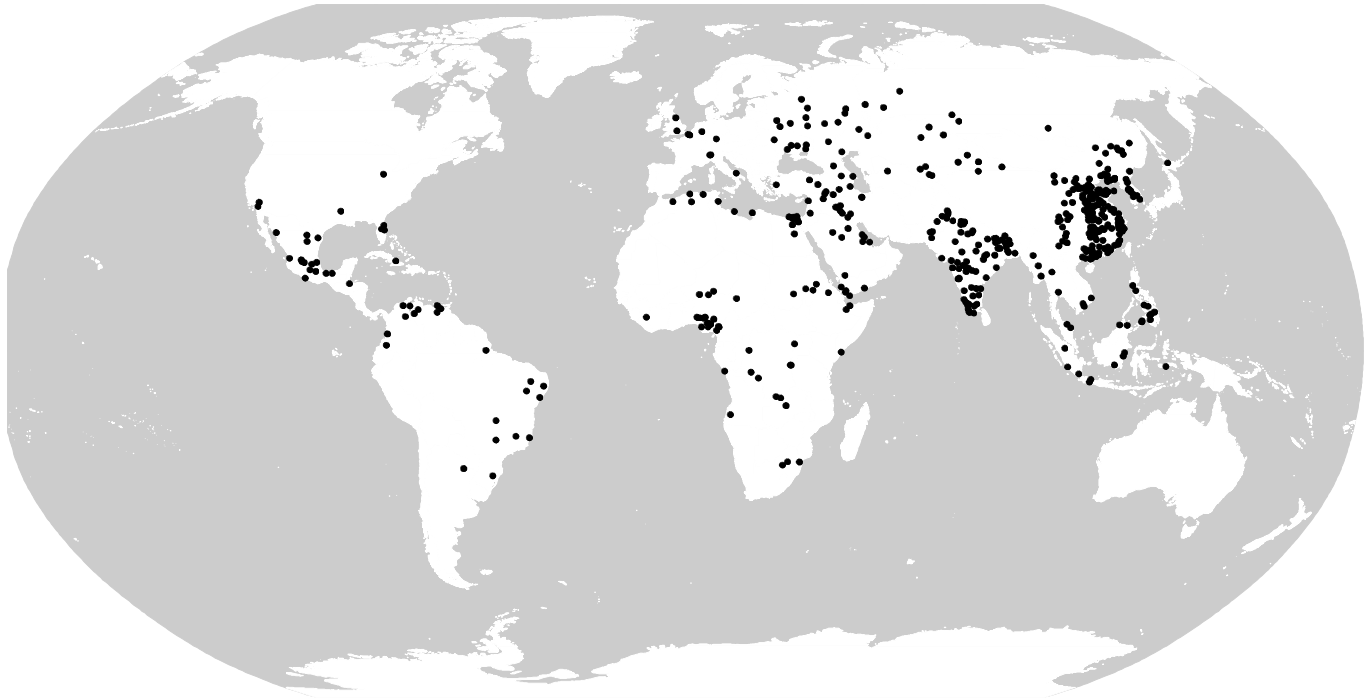
Sources: a. United Nations Population Division b. Authors' own calculations based on data from Scopus database

Table 2. Geographical coordinates for world urban centers of population (2005, 2000, 2015) and of publication (2000-4, 2005-9, 2010-4)

Period	Population Weighted	Entire Urban Field	Urban Globalization Research
1	37.76 E 24.40 N	6.93 W 30.36 N	16.80 E 25.19 N
2	39.36 E 24.11 N	2.81 W 29.62 N	11.74 E 26.93 N
3	40.81 E 23.81 N	6.57 E 28.82 N	16.62 E 26.95 N

Sources: a. United Nations Population Division b. Authors' own calculations based on data from Scopus database

Figure 1. World map of cities with zero 'urban' publications (2000-2014).



*Source: Own map based on data from Scopus and United Nations' Population Division.*