

THE HYBRID OUTCOME OF URBAN CHANGE: GLOBAL CITY, POLARIZED CITY?

AYAT ISMAIL

*Centre for Urban Research Cosmopolis
Vrije Universiteit Brussel
ayat.ism@gmail.com*

Abstract: A wide range of studies supports the assumption that levels of socio-spatial polarization, segregation, and exclusion are rising in global cities over the past decades as a direct outcome of certain global processes, such as the deindustrialization process, its associated changes in division of labor, and declined redistributive power of the welfare state. However, that assumption – known as the polarization thesis – is criticized based on several contentions, including the oversimplification of the global/local interplay by overlooking the role of local contingent factors that may modify, intensify, or reverse the expected socio-spatial outcome in individual cities. This study aims to capture the hybrid nature of the socio-spatial outcomes of global cities by proving that the complex process of restructuring of cities is a form of structural and chronological hybridity. Through providing a solid empirical ground for investigating the general applicability of the socio-spatial polarization thesis, as well as evaluating the influence of local contexts of cities on the outcomes of urban change. The research offers a theoretical review of the multifaceted restructuring of global cities. Then, the macro trends of global economy are linked to their micro outcomes (segregation patterns within cities), through understanding the implications of cities' economic functions on local urban policies and housing markets. Finally, the changes in socioeconomic segregation over the past decades are calculated for a large dataset of 66 global cities. The collective result of the analysis shows the downfalls of the generalized hypothesis. While the discussion of individual cities highlights certain contextual particularities, that are contributing to the production of unique socio-spatial configurations in different global cities.

Keywords: hybridity, global-local interplay, polarization, segregation, cities.

INTRODUCTION

The use of 'hybridity' as a notion to describe the mixing of 'cultural' forms¹ is extended to include other types of 'mixing' of institutional (de Ruijter 1996), organizational (Oliver and Montgomery 2000), and structural forms of social organization (Nederveen Pieterse 2001). I here argue that the concept of 'hybridity' can be further extended to describe the process (and outcomes) of spatial changes taking place in urban areas as a result of globalization. In order to reach this conclusion, the article challenges one of the popular theories on the socio-spatial transformations

ISSN 2283-7949
GLOCALISM: JOURNAL OF CULTURE, POLITICS AND INNOVATION
2013, 1, DOI: 10.12893/gjcp.2013.1.5
Published online by "Globus et Locus" in www.glocalismjournal.net



Some rights reserved

within global cities; known as the 'polarization thesis' (Kloosterman 1996; Hamnett 2001; Burgers and Musterd 2002; Mingione 2005).

In brief, socio-spatial configurations of post-industrial cities are repeatedly referred to as dual (Mollenkopf & Castells 1991), divided (Fainstein et al. 1992), fragmented (Burgers 2002), polarized (Sassen 1991; Friedmann 1986), and segregated (Massey and Denton 1993; Madanipour 2003). This seemingly 'standardized outcome' of growing dualization and polarization in cities since the 1970s is often explained by the declined manufacturing industries, along with the expansion of producer and consumer services, where the shift in cities' economic base contributes to other changes in their occupational and income structures, due to the resultant increase in supply of highly-skilled and highly-paid jobs on one hand, and low-skilled and low-paid jobs on the other (Friedmann 1986; Sassen 1991). Moreover, since professional workers are increasingly moving cross-borders as their firms operate globally, while low-skilled immigrants, illegal immigrants, and asylum seekers are also needed for low-paid jobs² (Sassen 2001; Castles 2002). Then, polarization is expected to not only refer to the increased gap between different income groups, but also the gap is widening along lines of race and ethnicity³ (Sassen 2001; Castles 2002).

Despite the fact that polarization thesis is widely accepted and supported by numerous studies on cities from around the world, yet, the generalized nature of polarization thesis and its alleged applicability on diverse global cities are questioned. As, the possibility that similar socio-spatial transformations are shared by different cities regardless their local contexts is derived from acknowledging economic globalization as the key driving force behind urban change (Castells 2000; Taylor 2000; Sassen 1991; 2006). If this is the case, then the global/local interplay is merely referring to the impact of powerful global processes on the local settings within cities, while the impact of cities' local contexts is minimal, or as Goldsmith puts it "trivial, like a butterfly's flight affecting the wind" (2000; 39). As a result, the presumed unproblematic influence of local contexts contributed to the tendency in global cities' literature to generalize the increased socio-spatial polarization as the main outcome of cities' new functions



in the global economy. However, by challenging the significance of economic globalization based on the credible assumption that other existing political, social, cultural, spatial structures are creating distinct local contexts for cities, which may alter, reverse, or intensify the resultant transformations in individual cities (Marcuse and Van Kempen 2000; Van Kempen 2007). Then in this case, cities are not expected to show similar tendency for increased polarization. Instead, the socio-spatial transformations in different cities are a result of the interaction between global processes and local situations in each individual city, where this interaction is a form of; first, a 'structural hybridity' (Nederveen Pieterse 2009) among several organizational spheres ranging from global to regional, national, municipal, and local, to finally produce unique – non-generalizable – outcomes for individual cities. And second, a 'chronological hybridity' as the resultant spatial outcome depends and defined by the fusion of historical layers of earlier spatial developments within each city (Massey 1984; Kesteloot 2000; 2005).

In the light of the above, this study supports the claims of the hybrid nature of spatial changes by disproving the general applicability of the polarization thesis, which in turn negates the oversimplification of the global/local interplay, and stresses on the influential role of local contingencies in reshaping the outcomes of global economic processes. The conclusions of the study are based on an extensive analytical study performed over 66 global cities. The article is organized into four sections; the first section provides a brief review of the polarization thesis, with a special focus on the expected spatial structures of the presumably socially polarized global cities. The second section highlights a number of 'local contingent factors' (see Marcuse and Van Kempen 2000 for details) that might be relevant to the resultant outcome of urban change. The third section represents the data and method deployed in the analysis process. The final section presents the findings and conclusions of the analytical study.



GLOBAL CITY, POLARIZED CITY?

In the light of the world/global city discourse, socio-spatial polarization is a product of a sequence of macro economic developments that are taking place in cities since the 1970s. Concisely, the sequence of macro economic developments started with the drastic decline in the manufacturing industries – such as steel production and textiles – in major cities, along with the rise of service industries – such as legal, and banking services (Beauregard & Deitrick 1995; Sassen 2001). This process of deindustrialization was associated with another ‘global process’ that is ‘despatialization of production’, which refers to the spatial shift of manufacturing industries from western cities to third world cities (Sassen 1990; Beck 2000). In the early 1980s, the rise of the new communication technology have facilitated the despatialization process by opening the door for production sites to be located offshore, remotely from their main headquarters (Bluestone & Harrison 1982, Friedman 2005). Harvey (2005) argues that despatialization of production became a necessity, because certain locations generate higher profit rates since they offer low-cost raw materials and/or low-wage labor. However, in order to achieve such level of mobility, markets for both capital and commodities have to be “open across the world so that surplus capital in one territory can easily circulate into other territories” (Harvey 2005, 94). Accordingly, the need for open markets and the boost in information technologies (connecting administrative centers, production sites, service activities, and their research centers) have led consequently to unprecedented level of mobility of capital beyond territorial or national borders (Soja 1989). As a result, mobility of capital has intensified the geographical competition over international investment where every city and region has to compete with the others to attract and retain investment (Harvey 1985b; Kesteloot 2000; Soja 1989; Fainstein 2010). Consequently, competitiveness, rise of service economy, and accelerated capital mobility, had contributed directly and indirectly to the transformation of the social structure of global cities towards more polarization.

Directly, social structures are expected to reflect the changes in the global and regional labor markets that are



generated by the process of economic restructuring (Soja 1985; Castells 1989; Friedmann 1995; Wade 1996; Sassen 2001).

On one hand, the increased demand for highly skilled professionals (or the transnational elite [Friedmann and Wolff 1982]) to support the advanced producer services has created a 'high-income stratum' of workers (Sassen 2001), such as entrepreneurs, executives, and financial advisers (Andersen 2002; Castles 2002). Their growing number in global cities is assumed to be a direct outcome of cities' specific role in world economy as centers of production and consumption of advanced services such as accounting, advertising, finance (Taylor 2001). Debatably, the lifestyle of the transnational elite contributes to the revitalization of urban economies, offers a wide range of low-paid jobs, and accelerates the gentrification process of declining neighborhoods (Sassen 2001; Andersen 2002).

On the other hand, the demand for low-skilled workers has also increased as a result of the competitiveness among transnational firms, because in order to increase their profits, they tend to reduce the cost of their services through subcontracting or employing undocumented immigrants (Soja 1989; Martin & Miller 2000; Sassen 2001). Also, low-skilled workers are needed to support the service industries in terms of transportation, cleaning, construction, etc. (Sassen 2001; Castles 2002), as well as supporting restaurants, shopping and entertainment activities in gentrified neighborhoods (Logan 2000; Sassen 2001). The result is the growing of a 'low-income stratum' of workers (Sassen 2001) including low-wage services workers, flexible workers (part timers or temps) and '3D-jobs'⁴ workers (Kesteloot 2000; Mingione 2005; Ritzer & Ryan 2011). Moreover, the disadvantaged population group also includes the unemployed, as the drop in demand for manufacturing workers due to deindustrialization, or, the computerization of the workplace (Ritzer & Ryan 2011) sent workers lacking certain skills to unemployment or poorly paid service jobs.

Indirectly, economic restructuring is accompanied by a number of political reforms, which in turn, contribute to the further severity of the socio-economic polarization in global cities. As, it is argued that national governments became 'powerless' in the face of cross-border competitiveness of globalization (Grey 1996; Harvey 1985a), and



yet even more involved in facilitating business activity (Panitch 1998). Tickell and Peck (2003) define this political shift as a Neoliberal political manifesto that is parallel to the economic trends of globalization, to promote more liberal economic environment, and support the free operation of the market. The implications of neoliberal globalization include: firstly, the dramatic decline in the redistributive power of the welfare state (Goldsmith 2000; Marcuse & Van Kempen 2000), where the state-spending cutbacks affected both the social protection system and the services subsidies system (Grey 1996; Beall 2002; Mingione 2005). As a result, families of the lower portion of the income distribution are placed in very unstable conditions (Martinotti 2005; Van Kempen 2007), as declining income and declining subsidies made them increasingly vulnerable to negative income shocks caused by illness or loss of a job (Massey 2008). Secondly, state-spending cutbacks were parallel to a wave of privatization of business, enterprises, and public services (Sullivan 1987). As a result, significant numbers of public employees lost their jobs (Fernandez et al. 2007) due to the downsizing strategies adopted by the privatized enterprises (Burke & Cooper 2000). While privatization of basic services lead to increase in services costs and created difficulties in accessing crucial sectors such as health, education, and housing for large sector of the population (Ritzer & Ryan 2011; Mingione 2005; Van Kempen 2007). Overall, the declined (or the market oriented) role of the state has originated new risk areas for disadvantaged population, which led polarization tendencies to persist (Martinotti 2005).

So far, the rationalization of the polarization thesis is based upon the assumption that local contexts of individual cities are unproblematic. For example, the efficiency of welfare systems varies greatly from country to country (Garrett and Nickerson 2005), then the declining redistributive power of the state would be relevant when discussing social changes in cases like Dutch or Swedish cities where the social protection system was once elaborate and efficient, but how can the declining role of the state be relevant to cases where social protection systems are already absent or minimal such as the case of Russian or Korean cities? Moreover, polarization thesis is criticized not only for overlooking local differences but also for ex-



aggregating the impacts of macro economic development such as the rise of service industries. Preteceille (1994) argues that due to the complexity of the economic structures of global cities, the services industry may in fact represent only a small part of urban employment. Then, how are the social structures of cities expected to significantly transform in response to a limited shift in their occupational structures? A subsequent section discusses in more details a number of local contextual differences that may interfere with the assumptions upon which the polarization thesis is formulated. But first, the article discusses the second half of the polarization thesis, that is the spatial dimension of polarization.

SPACES OF GLOBALIZATION AND INEQUALITY

Despite the relative inflexibility of the physical urban space to transform in response to certain economic and social process in terms of extent, form, time lag, etc. (Goldsmith 2000; Knox 1991; Beauregard & Haila 2000). The polarization thesis suggests that social and spatial forms of polarization are increasing simultaneously, this connection between the social and the spatial dimensions of polarization is clearly affirmed by Friedmann (1986) in his key article 'The World City Hypothesis'; "It is the familiar story of spatially segregating poor inner-city ghettos, suburban squatter housing and ethnic working-class enclaves. Spatial polarization arises from class polarization" (Friedmann 1986, 76). Indeed, it can be argued that the materialization of spatial polarization in residential areas can occur in a relatively rapid pace despite the rigidity of the built environment, because the socio-economic structure of each neighborhood can change due to either the social upward/downward mobility of its residents (Monkkonen 2011), or the physical household mobility from a neighborhood to another (Espino 2005). Accordingly, maps of spatial polarization and segregation in global cities can differ significantly in a short period of time within the already existing physical environment.

Another remark drawn from Friedmann's statement is the use of the terms 'segregation', 'ghetto', and 'enclave' (see Marcuse 2005 for definitions) to describe dif-



ferent forms of spatial polarization. In fact, most of the studies dealing with the polarization thesis use the terms polarization and segregation interchangeably to describe different social and spatial phenomena without a clear differentiation between the two terms (Hamnett 2001; Maloutas 2007). In general, according to Hamnett's (2001) comprehensive discussion over the historical development of duality, polarization, and segregation; the concept of polarization has a broad sense, and it became a 'general signifier' of growing urban inequality in large urban areas, while patterns of residential differentiation by class, race, gender, etc. are adequately described by the term 'segregation'. Therefore, from this point on, the article will refer to spatial polarization on neighborhood scale by the more precise term of 'spatial segregation'.

As the case of social polarization, the increased spatial segregation is explained in the world/global city literature as an outcome of the same macro economic development, political reforms, and the apparently changing social structures of cities. Once again, the increased competitiveness over international investment is a key issue in explaining how the increased social polarization is expected to contribute to increased spatial segregation. As competitiveness amplified the need for infrastructural investments, improved housing, and services (Soja 1989). It also led the urban and regional planning process to become increasingly controlled by private investors and profit-based organizations, while the exclusive role of government as the leading policy-maker is retreating (Soja 1989; Healey et al. 1995; Elander & Blanc 2001; Andersen 2002; Van Kempen 2007). As a result, competitiveness – along with the crisis of the welfare state, privatization, and multi-actor policy-making – has reformed the urban space to be delocalized and deeply commodified (Madanipour et al. 1998; Beauregard & Haila 2000).

Conceivably, both delocalization and commodification of urban space have impacted business and residential areas within global cities, while also exacerbated the spatial manifestation of social polarization. Firstly, delocalization (or despatialization) refers to a process started in the 1980s when real-estate market became global, as properties were both built and owned by transnational investors on the international market. In the United States, according

to the Coldwell Banker's survey in (1987), cities of New York and Los Angeles have 21% and 46% of their office spaces owned by foreign investors respectively. Albeit delocalization of space is caused by increased competitiveness and its consequent deregulation of the real-estate market, delocalization itself contributed to the increased global competition over limited local space (Fainstein 2010), which eventually led to the commodification of the urban space. Secondly, when urban spaces are perceived as commodities, they become under the control of market forces and the bidding power of money (Xu et al. 2009). Accordingly, access to urban spaces is increasingly defined based on the ability to pay and the desirability for certain spaces that promote new opportunities for profitable investment.

In the light of the above, commodification of space – in a socially polarized city – can raise a problematic issues of 'differential access' to public spaces and 'exclusion' from the housing market, which are directly linked to the production of spatial segregation (Espino 2005; Madanipour et al. 1998). Because, exclusion and integration largely revolve around access (Madanipour 2003), then when a certain group of the population is denied access to certain resources, services, and public spaces based on their income, social class, or color; then they are socially excluded (Peace 2001). Based on this abstract definition of exclusion, commodification of space has elevated levels of social exclusion by promoting discriminatory access strategies to public spaces in general and housing market in particular. Consequently, exclusion/inclusion from the housing market has created new constraints/choices for people on the two ends of the polarized social structure. Where the lack of choice for disadvantaged population and preferences of affluent population – in a deregulated housing market – are together contributing to residential segregation as follows.

On one hand, lower income groups including poor immigrants are expected to be out of the competition for decent housing, because commodification of space implies a relatively free bidding for residential land and properties (Espino 2005). Accordingly, disadvantaged groups who are excluded from the housing market are supposedly concentrated in the 'residual'⁵ housing where they can



afford (Kesteloot 2000). In addition to space commodification, welfare cutbacks also affected the supply of public housing unit due to the diminished subsidies provided by the state, causing further shrinkage of the possibilities of affordable housing for disadvantaged group (Van Kempen 2007). Moreover, the spatial concentration of poverty is exacerbated due to the displacement and re-concentration of lower-income groups as a result of inner city gentrification (Atkinson & Bridge 2005; Kesteloot 2005). As, the process of displacement starts with the rise of property values in gentrified areas, and then low-income groups become no longer able to pay for dwellings in those areas. As a result, they are displaced, and displacement is usually followed by their concentration in neighborhood with low-rent and most probably low-quality (Atkinson & Bridge 2005; Kesteloot 2005).

On the other hand, the personal preferences of the highly-paid professionals can dramatically contribute to a higher degree of residential segregation (Van Kempen & Özüekren 1998; Van Kempen 2007; Vandell 1995; Wassmer 2005). As, Their choices are usually based on type of housing, local services, and other resident attributes (race, income, wealth, education and family composition). For example, people who desire a certain service (such as K-12 public education in the US), and can afford to pay for it, will be concentrated where the service is provided (Wassmer 2005). The result is a clustering of high-income households closer to spatially based amenities. Other reasons for self-segregation of the upper class in 'exclusionary enclaves', 'citadels', or 'gated communities' (see Marcuse 2005) are maintaining social status, superiority of power and wealth, safety, security, and avoidance of the 'other' poor and ethnic minorities (Marcuse 2005; Espino 2005; Feitosa et al. 2011).

Apparently, the increased spatial segregation is a result of a predefined sequence of causes and effects. The causes are mainly global, while once again, the influence of local contexts on the course of spatial restructuring process is overlooked. For example, local governments in several global cities – such as Singapore (Van Grunsven 2000; Sin 2003) and Rotterdam (Kleinhaus 2004) – are implementing strict 'housing allocation programs'. In this case, the commodification/exclusion scenario discussed

above is not necessarily applicable, because residential mobility could be either insignificant or controlled to maintain high levels of social mix in each neighborhood. Accordingly, direction of change in spatial segregation (increase or decrease) will depend mainly on the efficiency of the *local* housing allocation program in these cities, rather than the *global* process of space commodification. The subsequent section discusses in more details the possible influence of local contexts on the process of spatial change.

LOCAL CONTINGENCIES: THE BLUE CARROT!

A legendary tale says that in the 16th century, the Dutch crossbred yellow and red carrots to produce orange carrots in honor of king William of Orange (Banga 1957). Orange? Well simply in biology, the resulting hybrids typically have intermediate traits of both geneses involved in the hybridization process (McCarthy 2006). Then, yellow and red produce orange carrots, and if there are blue carrots, then yellow and blue will probably produce green carrots. In this sense, if global processes are yellow, and local situations are red, then by overlooking local situations, polarization thesis suggests that the outcome of global/local interaction will always be yellow. And by replacing the red context with blue, purple, or any other color, the outcomes are still yellow – more segregation. As if the hegemonic nature of global processes is redrawing the world on a transparent canvas.

The carrots metaphor may seem naïve and devious, because after all, carrots are added to carrots to produce carrots that differ only in appearance, while global process and local contexts are not exactly 'idealtypical' (Brandsen et al. 2005) entities that can be tangibly mixed and produce a hybrid outcome. Therefore, approaching such global/local interplay – from hybridity perspective – has to capture the in-between structural practices that influence one another on different hierarchal scales, then by verifying that the spatial outcome of this interplay is actually marked by traits inherited from different practices (including those on the local level), only then can the concept of hybridity be broadened to describe geographical features produced



from the interaction of non-hegemonic global forces and non-transparent local contexts.

The analytical study provided in this article is designed to grasp this hybrid nature of spatial change by eliminating the possibility that spatial outcomes are defined solely by cities' integration in the global economy, while at the same time, the detailed discussion of individual cases reveals a number of regional, national, metropolitan, and local particularities that are clearly influencing the intensity and direction of spatial changes in global cities. To finally assert that spatial changes are outcome of complex processes of structural and chronological hybridity as noted in the article's introduction.

Structurally, the polarization thesis acknowledges that global impacts on local settings are channeled through different spheres of the urban hierarchy. It is believed that transnational institutions (global level) are downscaling central governments⁶ (nation-state level), which will impact urban policies (on both national and metropolitan level), to finally contribute to increased spatial segregation (on neighborhood level). For that matter, the problem with this logic is not the overlooking of the intermediate organizational spheres between the global and the local. Instead, the problem is the overlooking of the imprint each level can leave on the process as a whole. In other words, the thesis simplifies the restructuring process through the standardization of the influence of global forces and neutralizing any possible influence of national, metropolitan, or local particularities. Cases discussed later in this article show that, for example, public housing is being privatized in some cities, while new public housing provision programs are being implemented in other cities despite their high integration into the global economy. In this case, the geographical distribution of public housing units and the accessibility of the program (by disadvantaged population groups) will outline the maps of spatial segregation in unpredictable manner. Similarly, urban regeneration projects are not necessarily leading to gentrification (and its consequent displacement/reconcentration of the poor), few examples show that urban regeneration projects are still able to achieve improvements in residents' well being despite the profit-based atmosphere clouding the decision-making process. Furthermore, on



neighborhood level, homeownership rates, housing market flexibility, and residents' preferences are strong modifiers of residential mobility and hence spatial segregation. One example is the preferences of affluent entrepreneurs who belong to an ethnic minority to reside in the (usually poor) ethnic enclave near to their ethnic business; their choice will probably contribute to higher level of ethnic segregation, yet socioeconomic segregation can decrease accordingly.

Chronologically, the metaphor of the 'layered city' (Massey 1984; Kesteloot 2000; 2005) portrays how the socio-spatial structure of any city is a product of historical processes occurring in successive rounds of capital accumulation, each round has its own arrangement of economic sites and residential areas deposited in layers one upon another across geographical space. In this sense, it can be argued that spatial outcomes in global cities are a 'chronological hybrid'. Because, spatial features from previous layers may still be present in recent layers of spatial development, while the spatial outcome is a product of the interaction between the historically inherited spatial forms and present-day dynamics (Soja 1985; Kesteloot 2000). For example, patterns of ethnic segregation in global cities are not defined by recent flows of international migration and the increased labor mobility. Instead, concentrations of new comers to the city are highly dependent on already existing ethnic enclaves that represented nuclei for the new comers to settle around. Therefore, labor mobility alone cannot explain present concentrations of Turkish population in German cities nor the Indian population in British cities, because the first is formed by historical migration waves since WWII, while the later is an outcome of historical ties formed in the colonial era (Peach 2002; Massey et al. 2008). If it has any influence, labor mobility merely contributes to the altering of existing conditions that are accumulated over the years to produce a hybrid outcome, instead of imposing a non-rooted spatial outcome.



DATA AND METHOD

In order to examine the general applicability of the polarization thesis, the changes in spatial segregation of population (based on their socioeconomic status) are calculated for a large number of global cities. The collective results show if there are any correlation between, on one hand, cities' global status, and on the other hand, certain changes in spatial segregation level in these cities. For that matter, two types of data are required: a robust indicator for cities' level of integration into the global economy, in addition to geospatial data on sub-city level to assist in calculating spatial segregation indices for cities of the dataset.

After reviewing several cities' classifications and several methods for calculating spatial segregation⁷, the study deploys the 'GaWC classification of world cities' for 2010 as its primary dataset. The list consists of 178 cities categorized according to their global status into alpha, beta, and gamma cities. The choice for the GaWC world cities list was made for the reason that the classification is based on a huge data collection, and robust network connectivity calculations (see Taylor et al. 2010 for details). Accordingly, position of any city in the GaWC list is highly indicative about its global status and no further data is required in this regard. Also, the classification is based solely on economic indicators, which eliminates the complexity generated by other environmental, cultural, or political variables that are included in other cities' classifications.

As for the spatial analysis of segregation on sub-city level, the study explored several measures and indices for spatial segregation⁸. And due to the nature of the study, the suitable index has to fulfill twofold criteria. First, the chosen index must incorporate the spatial aspect into the analysis (to avoid checkerboard problems⁹ associated with aspatial indices). Second, the index must capture the diversity of contemporary cities and measure the spatial segregation among several¹⁰ population groups simultaneously. The index used in the analysis is multi-group spatial index SD(m) developed by Wong (1998, 2002, 2003). Here is a brief backdrop on the index's development and definition.

The original dissimilarity index D (Duncan and Duncan 1955) was a two-group aspatial index defined as:

$$D = \frac{1}{2} \sum \left| \frac{w_i}{W} - \frac{b_i}{B} \right|$$

where b_i and w_i are black and white population counts in a real unit i , and B and W are the total black and white population counts of the entire study region, respectively.

There are several attempts to develop the original D index, among these attempts, Morgan (1975) and Sakoda (1981) introduced a multi-group version of D, that is $D(m)$, which can accommodate more than two groups, but the measure is still aspatial. It is defined as:

$$D(m) = \frac{1}{2} \frac{\sum_i \sum_j |N_{ij} - E_{ij}|}{\sum_j N * P_j (1 - P_j)}$$

where:

$$E_{ij} = \frac{N_i * N_j}{N}$$

and

N_{ij} is the population count of the j population group in areal unit i

N_i is the total population in areal unit i

N_j is the total population of group j in the entire study region

N is the total population in the entire region

P is the proportion of population in group j

A spatial version of $D(m)$ was proposed by (Wong 1998). The formulation of the spatial version of $D(m)$ is based upon the concept of composite population counts. The composite population count of areal unit i for group j is defined as

$$CN_{ij} = \sum_k d(N_{kj})$$

where $d(\cdot)$ is a function defining the neighborhood of i , and based upon the premise that within the neighborhood of i , people belong to different population groups can interact as if they are in unit i . After the composite population counts for all areal units are computed, they are used to calculate $D(m)$ as if they are the original population counts. Therefore, the spatial version of $D(m)$ is $SD(m)$ as defined:

$$SD(m) = \frac{1}{2} \frac{\sum_i \sum_j |CN_{ij} - CE_{ij}|}{\sum_j CN * CP_j (1 - CP_j)}$$

In order to calculate the change in $SD(m)$ index for each city over the years, each city in the GaWC list of world cities requires census data on local level – such as division, neighborhood, census tract, etc. – providing detailed count of population/households in different segments of monthly or yearly income, as well as their spatial distribution over the city. For example, the data used in the analysis of Singapore is: local sub-city divisions are 35 populated planning zones defined by Urban Redevelopment Authority. Population is categorized into 9 income groups according to their monthly income (below 1000\$ – 1000\$ to 1499\$ – 1500\$ to 1999\$ – 2000\$ to 2999\$ – 3000\$ to 3999\$ – 4000\$ to 4999\$ – 5000\$ to 5999\$ – 6000\$ and over). Also, the index is calculated for the city on the years 2000 and 2010 based on the availability of data. The calculations of the index are generated using an ArcView tool provided also by Wong (2002, 2003).

Several challenges have faced the analysis process throughout the data-gathering phase, unifying data format, and calculating segregation indices¹¹. Most importantly, intercity comparisons of $SD(m)$ values proved problematic (Boal 2005). Because, firstly, income categories of population for different cities are not unified, and secondly, different scales of areal units within cities can highly influence the indices value. As the spatial segregation indices are scale dependent, if the areal units are smaller, then the indices tend to be with higher value and vice versa (Pendall 2005; Boal 2005). Therefore, an index for city divided into census tracts cannot be compared to an index for city divided into wards or municipalities. In order to overcome the difficulties of intercity comparison

and to avoid standardization of data for all cities in the dataset, each city has two values of SD(m) in two different years, each city can be compared to itself over time to finally evaluate the percentage of change in the value of segregation within this particular city. After calculating the change occurred in all cities over the years, the direction and percentage of change in segregation in all cities can be compared to each other – since the problematic use of the actual index value is avoided – and to the position of cities in the global network as well.

During the data-gathering phase, the primary dataset of the 'GaWC classification of world cities' was reduced to 66 cities based on the data availability, the final dataset contains of 20 alpha, 23 beta, and 23 gamma cities. Socio-economic data for all cities are available starting the year 1996 up to 2010 – earlier data for the 1970s and 80s are not available in digital form for most cities. And since the census year differ from country to country, the conclusions are based on the average 'yearly' percentage of changes in SD(m) index of income segregation.

ANALYSIS AND FINDINGS

Global cities with different level of integration into the global economy showed a diverse pattern of changing segregation in terms of direction and intensity (see appendix for exact values of SD(m)). Figure (1) shows that the three global ranks contain cities with both increase and decrease in values of segregation. The highest increase in segregation is scored by the Mexican city of Guadalajara (gamma city) with 3% of yearly change in SD(m) value (33% increase in income segregation from 2000 to 2010). While on the other end of the spectrum, Brussels (alpha city) scored -3.7% less income segregation by year (-26.4% of change from 2001 to 2008).



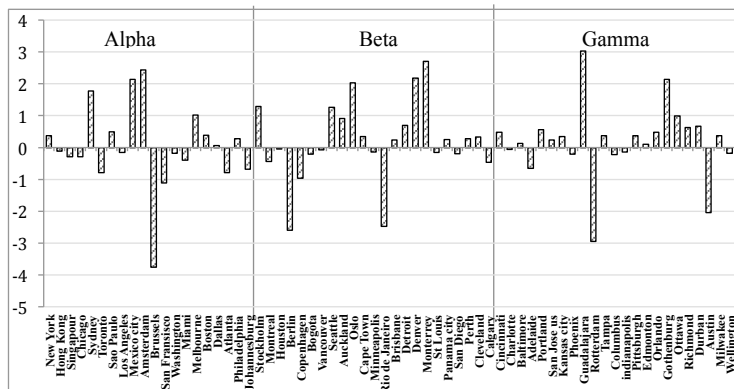


Fig. 1. Global cities according to their rank and yearly change in income segregation index

For better interpretation of the results, figure (2) and (3) sort cities according to the yearly changes in income segregation value. Figure (2) shows that, in total, only 53% of cities of the dataset are supporting the polarization thesis that global cities are prone to increased segregation. However, the 53% is not conclusive enough to support the general applicability of the thesis. 40.9% of cities are also global cities but with significantly less segregation between income groups. Clearly, despite the predictions of growing inner city gentrification, and the shifts in supply and demand for labor, still 27 global cities (40.9% of the dataset) managed to escape the cliché socio-spatial drawbacks of globalization. While another 6.1% of cities showed no significant changes at all.

Moreover, figure (3) shows that, in general, there are no clear patterns for spatial change associated with cities' rank in the network. Not only all 3 categories have both cases of increased and decreased values of spatial segregation, but also gamma cities showed higher tendency for increased segregation than alpha cities. Where 65.2% of gamma cities have witnessed a significant increase in income segregation compared to only 40% of alpha cities. This observation contradicts the general agreement in the global city literature that higher cities in the global ranking are prone to higher levels of increased segregation due to the higher intensity of their economic restructuring. Simply, changes in segregation are not predictable as

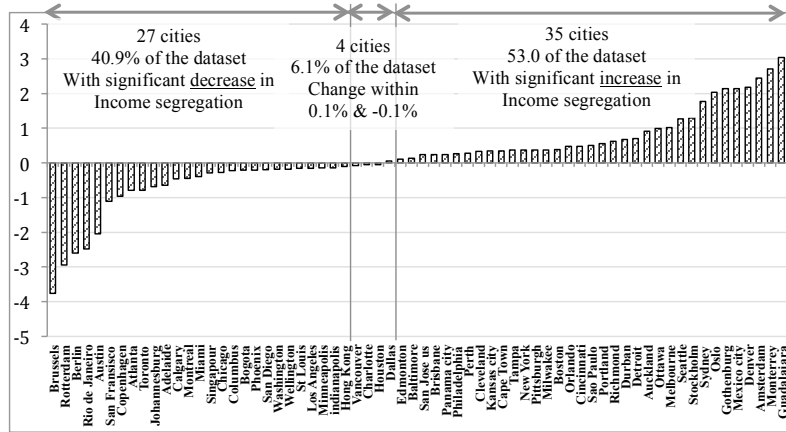


Fig. 2. Global cities sorted according to the yearly change in income segregation index

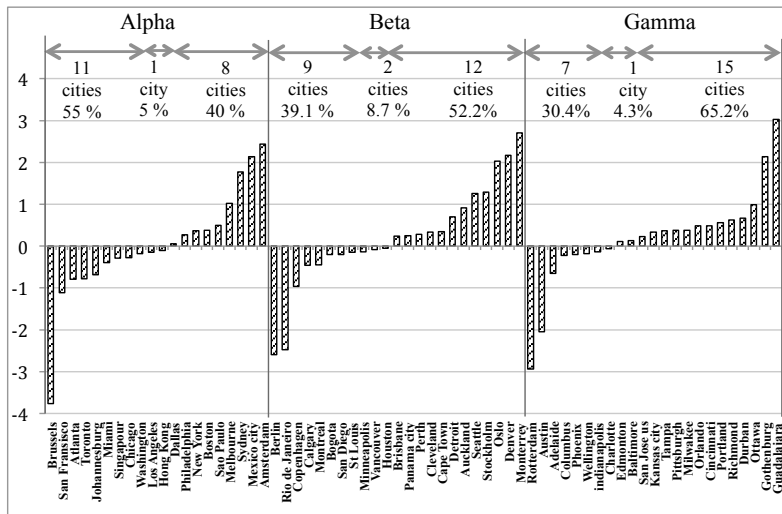


Fig. 3. Cities of each global rank, sorted according to yearly change in income segregation index

suggested by the polarization thesis; the top alpha city of New York scored only 0.3% yearly increase in segregation, while Amsterdam – which is also alpha city – scored 8 times the change occurred in New York (2.4% yearly increase in segregation). Ironically, each of beta and gamma cities of Monterrey and Guadalajara scored higher segregation change than of New York and Amsterdam combined together (2.7% and 3.0% yearly increase respectively). While cities of Brussels, San Francisco, Singapore, and Johannesburg have witnessed a significant decrease in segregation despite being alpha cities under intense global forces and ‘supposedly’ massive economic restructuring. Then, how is it still possible to assume that spatial changes in global cities are defined solely by global economic developments? Therefore, the study traces patterns of change in income segregation on both regional and national level, then discusses spatial changes in individual cities, to finally explain the absence of unified patterns of change in global cities.

PATTERNS OF INCOME SEGREGATION ON THE REGIONAL AND NATIONAL LEVEL

Absence of clear patterns of spatial change on the global level proves that socio-spatial transformations in cities cannot be fully understood away from their local circumstances and contexts. Figure (4) shows global cities categorized according to their geographical regions and sorted by their yearly change in income segregation index. In general, global cities of Latin America and the Australian continent proved to be more prone to income segregation, where 71.4% of cities of each of the two regions showed increased SD(m) value over the past decade, compared to 50% of Western European cities and 48.7% of North American cities. Cities of Africa and Southeast Asia are underrepresented in this analysis due to lack of data.

An interesting observation from figure (4) suggests that inconsistent patterns of spatial changes also showed on the regional and national level. For example, Brazilian cities of Sao Paulo and Rio de Janeiro show a stark contradiction in both intensity and direction of change in income segregation despite sharing the same national context,



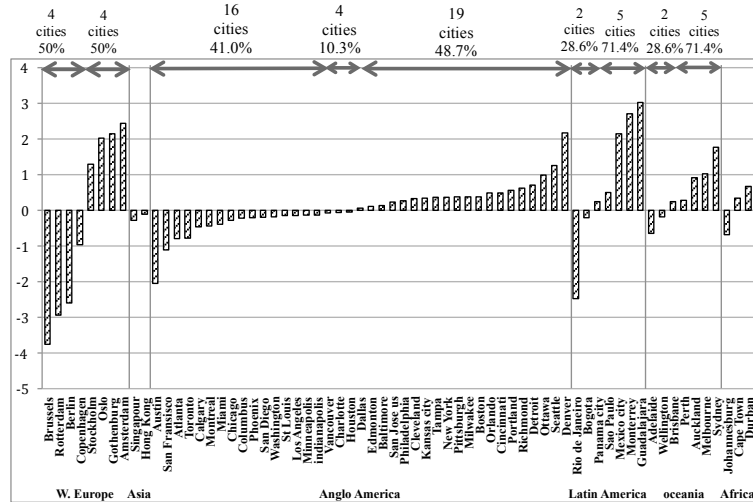


Fig. 4. Global cities by their broad geographical region and yearly change in income segregation

same for Johannesburg and Cape Town, Rotterdam and Amsterdam, and Austin and Denver. As argued earlier, distinct spatial outcomes are expected to emerge according to complex process of structural and chronological hybridity. Under this condition, inconsistencies in cities' behavior showed in figure (4) can only be explained by tracing the alterations caused by local situations on the standardized outcomes of global processes, the upcoming sections provide a number of examples for such dynamics.

Firstly, gentrification as a global phenomenon (Atkinson and Bridge 2005) is considered a direct outcome of the rise of service industries, while at the same time, it contributes to higher level of socioeconomic segregation by displacing the poor and creating citadels for the rich. This standardized and flat perception of gentrification has different meanings when situated in the context of specific cases. Alpha cities of Hong Kong, Brussels, Amsterdam, and Sydney are all experiencing some level of gentrification. Yet, unexpectedly, the scale and geography of gentrified areas in Hong Kong and Brussels have actually contributed to their decreased socioeconomic segregation. In more details, the mountainous geography of the island

of Hong Kong, and its very high density of population, have led urban space to be limited (Monkkonen and Zhang 2011). As a result, urban development projects took the form of high-rise buildings that reach up to 50 stories emerging in scattered locations around the city (ibid.). And since high-income/high-rise buildings are brought in close proximity to older residential stock inhabited by low-income households, the overall income segregation is decreased on neighborhood level, even if the fragmented urban fabric is maintained on the micro scale (such as block level).

Similarly, gentrification process in Brussels is also scale dependent. According to Van Criekingen and Decroly (2003), the scale (size) of gentrification projects in Brussels is “smaller than census tract” (2466). Which explains the decreases segregation on city level, because municipalities that host a small-scale gentrification project will have higher social mix, which cause the average level of segregation on municipalities level drop significantly. The case of Brussels also shows that the intensity of gentrification is not necessarily dependent on the city functions as a global city, or in this case, as a capital of Europe. Because, despite the increased demand for office and residential spaces as a result of the expansion of the European Union institutions in Brussels, still, gentrification in Brussels is “modest” (Kesteloot 2000: 203) compared to level of ongoing restructuring of the city. Also, the gentrification is contained in certain areas such as Leopold Quarter (Swyngedouw et al. 2002) and in the eastern edge of the 19th-century belt in general (Kesteloot 2000), where EU institutions are located. Therefore, the displacement of poor households in Brussels as a result of gentrification is insignificant and could not contribute to higher level of socioeconomic segregation on city level.

While on the contrary, Alpha cities of Amsterdam and Sydney show textbook cases of large-scale gentrification accompanied by large-scale displacement and reconcentration of the poor. However, comparing patterns of gentrification in both cities to those in their fellow cities of Rotterdam and Adelaide respectively reveals that governmental actions on local level are able to modify the course of gentrification and counteract its drawbacks. In Dutch cities, the national Urban Renewal Policy – since



1997 – aimed to reduce spatial concentration of low-income households and ethnic minorities to finally promote social mix in residential areas (Kleinhans 2004; Bolt et al. 2009). Consequently, a number of diversification projects were introduced in several Dutch cities. In Amsterdam, diversification followed a typical route of gentrification, because neighborhood restructuring resulted in the demolition of old social rented dwellings, the construction of owner-occupied expensive dwellings, and displacement of low-income households who used to reside in the demolished dwellings (Kleinhans 2004; Bolt et al. 2009). Eventually, the attempt of improving social cohesion has resulted in ‘zero-sum outcome’ (Musterd and Andersson 2005) because the displaced households were reconcentrated in other poor areas elsewhere in the city (Bolt et al. 2009). While in Rotterdam, diversification projects were accompanied by strict housing allocation rules set by local government. Those rules were defined in 2003 by the ‘Rotterdam zet door’ action program (Kleinhans 2004), which aimed to control the spatial distribution of low-income households and prevent their re-concentration in disadvantaged neighborhoods. Apparently, Rotterdam plans succeeded in achieving social mix – at least statistically, as figure (2) shows that Rotterdam is in the second place among the top 10 cities with decreased socioeconomic segregation. Similarly in Australian cities, the large-scale gentrification and displacement in Sydney was avoided in Adelaide due to local government interest in promoting social inclusion. Therefore, urban regeneration projects¹² in Adelaide were implemented parallel to other community development programs initiated by local government to reduce welfare dependence and promote social inclusion of poor residents (Forster 2006; Arthurson 2012). While the absence of such programs in Sydney, and other Australian cities, contributed to the exacerbated intensity of gentrification and its drawbacks.

Secondly, according to the polarization thesis, public housing provision in global cities is expected to drop due to state-spending cutbacks and the market-oriented national and metropolitan housing policies. Correspondingly, housing opportunities for the poor are diminishing as the existing public housing is either demolished or privatized, leading eventually to the concentration of poverty in

residual neighborhoods. Again, as the case of gentrification, this standardized cause-effect relation is not applicable on all cases because housing policies vary greatly from country to country and from city to city; Mexico and Sweden present a good example for such diversity. On one hand, the ability of the Mexican government to subsidize basic amenities (including the public housing) was not affected by market-forces as propagated in the literature. Instead, according to Monkkonen (2011), the 'Federal Housing Finance System' in Mexico issued 220,000 mortgages during the 1990s, this figure jumped to 400,000 mortgages per year between 2000 and 2005. While on the other hand, the well-developed Swedish welfare system was impacted by neoliberal reforms, as a result, the existing public rental dwellings in Swedish cities are increasingly being privatized (Hedin et al. 2012). Oddly, figure (2) shows that – despite the stark contrast in public housing provision in both countries – all Mexican cities (Mexico City – Monterrey – Guadalajara) and Swedish cities (Stockholm – Gothenburg) are within the top 10 cities with the highest increase in socioeconomic segregation.

The case of Mexican cities highlights that changes in segregation cannot be easily predicted based on the increase/decrease in the number of mortgages issued. Instead, patterns of segregation depends mainly on the quality of the social housing in terms of the allocation of housing units and the accessibility of the program by the deprived population groups. In more details, the federal housing finance system has actually contributed to more segregation in Mexican cities, through triggering the construction of large tracts of middle-class single-family houses in the poor peripheries of cities across the country, by providing mortgages exclusively to registered salaried employees in the formal sector (Monkkonen 2011). And since loans have been given only to registered employees, thousands of poor informal workers were excluded from the new suburban development. Eventually, the excluded poor were concentrated in informal settlements, and local governments were unable to effectively manage the growth of informal settlements of poor families (Audirac et al. 2012).

Other European cities also support the conclusion that increased segregation is not necessarily tied to the decrease in public housing provision. In Berlin, despite



the reduction of public housing stock from 30% of total housing units in 1990 to 15% in 2008 (Aalbers and Holm 2008), figure (4) shows that Berlin witnessed insignificant change in levels of socioeconomic segregation. Similarly, the documented small shares of public housing in Barcelona and Brussels did not contribute to higher levels of segregation. Instead, Brussels achieved socioeconomic integration despite the fact that the role of the state in housing provision has never been very large (Kesteloot & Cortie 1998).

Thirdly, as argued, historical layers of development are expected to leave a trace on the socio-spatial outcomes of global cities. One example for such chronological hybridity is the historically uneven industrialization of cities in Brazil and in the United States, which explains the inconsistent patterns of change in segregation scored by cities of both countries.

In Brazil, during the 1950s, Sao Paulo overtook Rio de Janeiro as Brazil's largest city as a result of the rapid and dynamic industrialization of Sao Paulo metropolitan area (Ribeiro and Telles 2000), while the inability of Rio de Janeiro to attract the consumer goods sector has contributed to the historically higher poverty and unemployment rates in Rio than those in Sao Paulo (Telles 1995). Yet, later in the 1980s and 1990s, the impact of deindustrialization was more significant on Sao Paulo (where the industries left to hinterlands first then to Asia in later decade (Audirac et al., 2012)) than on Rio which had already been dependent on small scale services sector (Ribeiro and Telles, 2000). For that matter, it can be argued that uneven industrialization in previous decades had impacted the level of vulnerability of cities toward the impacts of current economic transformations. Rio de Janeiro was not impacted by the global process of deindustrialization because simply it is one of the cities "that have grown without the benefit of industrialization" (Telles 1995, 1200). Thus, the impacts of deindustrialization on the socio-spatial structures of global cities cannot be generalized. Also, as the case of Rotterdam and Adelaide, the significant decreases in socioeconomic segregation in Rio de Janeiro is explained by the success of local government in implementing urban development initiatives, such as Favela-Bairro project in 1994 (UN-Habitat 2003). Similar ini-



tiative were proposed in Sao Paulo, such as the public-private partnerships projects in Sao Paulo's master plan in early 1990s (Siqueira 2012). Yet, they failed to provide the poor with access to middle-class housing as the case of Rio.

In the United States, the 1950s were the golden age of manufacturing in central cities of the Northeast and Midwest, then the increasingly footloose industries shifted slowly – during the 1950s to the 1990s – to the Southeast then the Southwest/West then finally to Asia in the 1990s to present (Ross 2011). With the massive impacts of deindustrialization on cities of the Northeast and Midwest, they were labeled as Rustbelt cities, a term that summarizes the process of fiscal crisis and the consequent joblessness, tax revenue loss, and concentrated poverty (Ross 2011). As a result, the decline of Rustbelt cities accelerated the shift in population and employment to the South into the fast growing Sunbelt cities (Chapple and Lester 2010). The North and South divide in the USA was intensified in the 1980s due to neoliberal federal policies in Reagan's era, where "state and municipalities began to adopt entrepreneurial strategies in order to attract external capital investment to their territorial jurisdictions" (Brenner 2002, 8) including infrastructure investments and locational decisions of industries based on the supply of cheaper labor (Brenner 2002, 8).

Apparently, as shown in figure (5), the socio-spatial impacts of the historically uneven development between Rustbelt cities and Sunbelt cities – since 1940s to 1980s – are not yet reversed. The map shows the 33 American cities, of which 14 cities are Sunbelt cities, the rings indicates the value and direction of change in income segregation from 2000 to 2009. In the North, 14 out of 19 (73.7%) cities have witnessed an increase in income segregation, compared to only 4 out of 14 (28.6%) cities in the Sunbelt.

Brenner (2002) explains the continuation of the north-south divide in the 21st century to be a result of the ineffective reform of federal policies under Bush and Clinton administrations. As a result, market-based urban policies continued to sustain the regional competitiveness over investment. Seemingly, impacts of uneven industrialization – since the 1940s – are still visible in American cities. Yet, a detailed discussion is still required to explain the inconsistencies showed by individual cases, such as the

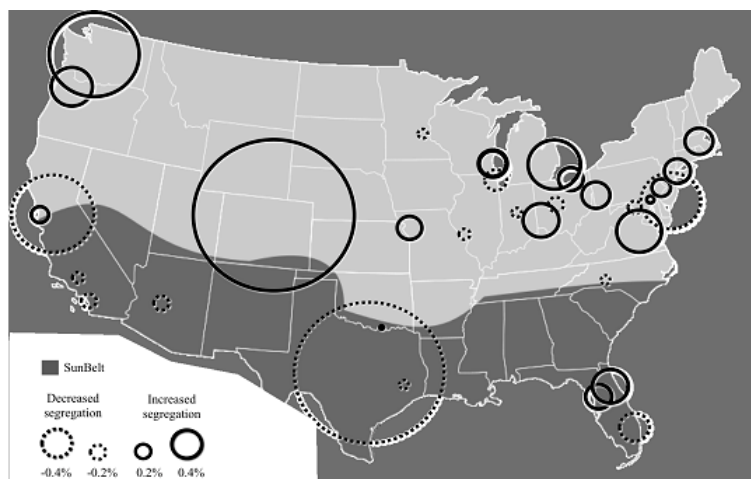


Fig. 5. Increased / decrease in income segregation in both Sunbelt and Rustbelt cities in the USA

decreases segregation in rustbelt city of Chicago and increased segregation in sunbelt city of Dallas.

Finally, evidence from Johannesburg and Singapore suggests that changes in socioeconomic segregation are influenced by other household characteristics including their color or ethnic origin. In the case of Johannesburg, social classes in the city – and across South Africa – have always been defined according to color line; “[wealth] was largely in the hands of white South Africans” (Beall 2002, 47). Then, after the first non-racial, democratic elections in 1994, which coincide with the rapid growth of service sector and changes in employment patterns, race and class association have begun to erode, and new black middle class started to grow to support the services industries that were predominated by whites (Beall 2002). For that matter, the decreased socioeconomic segregation is explained by changes in labor market that are caused, not only by economic changes in the global context, but also caused by changes in racial segregation in post-apartheid Johannesburg. Furthermore, unlike the consensus of powerless government propagated in the global city literature, local urban governance in Johannesburg reached successfully the balance between achieving glob-

al competitiveness and tackling spatial segregation by executing efficient and successful programs of black empowerment and poverty reduction (Beall et al. 2000). However, despite the fact that Cape Town and Durban share the same national, political, and historical context of Johannesburg, both cities showed different direction of spatial transformation than their fellow city. The reason behind this inconsistency is individual situation of each city. Where unlike Johannesburg, 'shack-dwellers' movement in both Cape Town and Durban have resisted forced eviction of blacks from slums area in center cities to peripheral townships (Huchzermeyer 2011), which caused both racial and income segregation to be harder to tackle.

Similarly, in the case of Singapore, changes in socio-economic segregation are also explained by existing patterns of 'ethnic' segregation, as well as other housing regulations and measures taken by the state. The individuality of Singapore is derived from two main conditions. First, Singapore is historically multiracial society since its establishment in 1819, comprised of three main ethnic groups: Chinese, Malay, and Indian (Sin 2003). Where, Chinese are the largest group with 79% of total population followed by Malay with 14%, Indian with 6%, and the remaining 1% – labelled as 'others' – are mainly European and other nationalities (Department of Statistics, Singapore 1996). Second, for an alpha city, the state intervention in housing sector is exceptionally high. In 1998, 86% of the total population resided in public housing constructed by the Housing and Development Board (HDB) (Sin 2003).

Socioeconomic segregation patterns in Singapore have always been defined by the preferences of ethnic groups to cluster with co-ethnics. And since Malays – for example – have higher socioeconomic status and they tend to occupy higher-quality public housing units (Sin 2002). While Indians, on the other hand, are more isolated in lower-quality public housing units (Sin 2002). Accordingly, self-segregation of Malays and Indians can lead to a wider gap between income groups. However, the allocation of public housing units overcame the socioeconomic segregation resulting from ethnic regrouping. In fact, the HDB reformed its public housing allocation system in the late 1980s, by the aim of making it "more efficient and



fair" (Tu 1999, 104). According to Sin, "the entire public-housing landscape in Singapore has been engineered in such a way as to yield low segregation scores". (2002, 434). Where each planning area has fair shares of all four types¹³ of apartments vary in sizes and prices (Singapore Department of Statistics 2009). Noticeably, despite its high rank as a leading alpha global city, Singapore public housing system was not affected. Also, it is argued that the influx of poor immigrants to the city did not contribute to any change in socioeconomic segregation, as foreign workers regulations compel employers to provide suitable accommodation for their foreign workers by their arrival in Singapore (Cho 2011). Therefore, it is nearly impossible for low-skilled foreign workers to cluster in poor areas of the city.

To sum up, geography of Hong Kong, historically uneven development in Brazil, social inclusion programs in Johannesburg and Adelaide, housing allocation restrictions in Rotterdam, and ethnic composition of Singapore are just few examples of how the spatial transformations in global cities are a product of both global processes *mélanges* with historical, political, cultural, and geographical particularities across the national, metropolitan, and local contexts of each city. To finally produce a 'hybrid' spatial outcome; hybrid in terms that the outcome carries distinct qualities that can be traced back to all the modifiers exist – structurally – on different levels of the urban hierarchy from global to local, and – chronologically – on different layers of previous developments.

A clear example for such hybridity is the case of Hong Kong, where segregation patterns are an outcome of complex interaction of (1) the city's economic functions in the *global* economy, (2) the *political* milestone of the handover of Hong Kong to the Chinese authority in 1997¹⁴, (3) the *natural* outbreak of H5N1 avian influenza, then the epidemic of severe acute respiratory syndrome (SARS) in 2003¹⁵, (4) the city's *demography* and its high population *density*, and finally (5) the mountainous *topography* of the island. All these factors have contributed to the distinctive urban characteristics of Hong Kong including its skyline, social structure, ethnic composition, and its spatially fragmented urban fabric. Similarly, each global city has its own sets of 'modifiers' that cannot be



overlooked, because these modifiers are proved to be an essential part of the complex global/local dynamics. The absence of standardized spatial outcome for global cities affirms that it is no longer possible to perceive the global/local interplay as a unidirectional cause-effect relation, in which the global processes are expected to reshape local settings of cities. Instead, context matters, history matters, and both are reflected on the outcomes of cities' restructuring, even if this restructuring is taking place under the seemingly prevalent conditions of globalization.

NOTES

- ¹ As a result of increasing global interconnectedness (Eriksen, 2007).
- ² Due to poor immigrants' low bargaining power in the labor market (Waters, 1995).
- ³ The article focuses only on socio-economic segregation, refer to the original study for more details about the ethnic dimension of the polarization thesis.
- ⁴ '3D-jobs' is a term referring to the dirty, demanding, and dangerous jobs, or sometimes dirty, dangerous and difficult (Castles, 2002).
- ⁵ Residual housing refers to old and private rented dwellings in inner city declined neighborhoods that are usually in bad condition and relatively cheap (Kesteloot et al., 1997).
- ⁶ One example is the pressure of transnational institutions on central government to alter migration restriction to promote easier labor mobility, the result is the increased cross-border migratory flows on nation-state level (Castles, 2002), and with concentration of immigrants in metropolitan areas, ethnic segregation is expected to increase on the local level due to the deregulation of housing markets in global cities.
- ⁷ The original study reviews several global cities' classifications and provides criteria for choosing the most suitable list to be the primary dataset for the analytical study.
- ⁸ Refer to the original text for more details.
- ⁹ Checkerboard problem is easily explained by an example of a city divided into census tracts, that are distributed in white-black checkerboard form, by assuming that white population reside mostly in the white tracts and black population reside mostly in black tracts. Calculating dissimilarity index will give a certain value, and the problem appears by shuffling the white and black squares on different sides of the board and calculating dissimilarity index once again. However, the value of D stays the same despite the added spatial concentration of census tracts populated by each group (Behr, 2004).
- ¹⁰ Dissimilarity index along with other indices such as P* exposure index (Bell, 1954), the Atkinson index (Atkinson, 1970), and many others, have been criticized for being limited to two-groups analysis.
- ¹¹ Refer to the original study for details.
- ¹² Such as 'The Parks neighborhood renewal' in Adelaide's west (Forster, 2006) and 'Salisbury North urban improvement project' in Adelaide's north (Arthurson, 2012).
- ¹³ Price of public housing units is often defined in terms of the number of rooms. Types of housing units are: 1-/2- room flats, 3-room flats, 4-room flats, 5-room/Executive flats (Sin, 2002).
- ¹⁴ Which altered the entry visa and work permits regulations especially for mainland Chinese (Ullah, 2012) causing unprecedented influx of workers to the city.



¹⁵ Consequently, in-flows of foreign (non-Chinese) workers to Hong Kong slowed down compared to other alpha cities in the same period of time. Which altered the ethnic composition of the city due to the relative retreat of foreign immigration and the increased inflows of Mainland Chinese in a basically Chinese community.

REFERENCES

- Aalbers, Holm 2008: M.B. Aalbers, A. Holm, *Privatising social housing in Europe: The cases of Amsterdam and Berlin*, in K. Adelhof, B. Glock, J. Lossau, & M. Schulz (eds.), *Urban trends in Berlin and Amsterdam* (Berlin, Berliner Geographische Arbeiten, Humboldt Universität zu Berlin), p. 12-23.
- Andersen 2002: H.T. Andersen, *Globalization, spatial polarization, and the housing market*, in "Geografisk Tidsskrift: Danish Journal of Geography", 102, p. 93-102.
- Arthurson 2012: K. Arthurson, *Social mix and the city: Challenging the mixed communities consensus in housing and urban planning policies* (Collingwood, Vic., Csiro Publishing).
- Atkinson 1970: A. Atkinson, *On the measurement of inequality*, in "Journal of Economic Theory", 2(3), p. 244-263.
- Atkinson, Bridge 2005: R. Atkinson, G. Bridge, *Gentrification in a global context: The new urban colonialism* (London, Routledge).
- Audirac, Cunningham-Sabot, Fol, Moraes 2012: I. Audirac, E. Cunningham-Sabot, S. Fol, S.T. Moraes, *Declining suburbs in Europe and Latin America*, in "International Journal of Urban and Regional Research", 36(2), p. 226-244.
- Banga 1957: O. Banga, *Origin of the European cultivated carrot and the development of the original European carrot material* (Wageningen, IVT).
- Beall 2002: J. Beall, *Globalization and social exclusion in cities: Framing the debate with lessons from Africa and Asia*, in "Environment and Urbanization", 14(1), p. 41-51.
- Beall, Crankshaw, Parnell 2000: J. Beall, O. Crankshaw, S. Parnell, *Victims, villains and fixers: The urban environment and Johannesburg's poor*, in "Journal of Southern African Studies", 26(4), p. 803-855.
- Beauregard, Deitrick 1995: R.A. Beauregard, S. Deitrick, *From front runner to also-run: The transformation of once-dominant region, Pennsylvania, USA*, in P. Cooke (ed.), *The rise of the rustbelt* (New York, St. Martin's Press), p. 52-71.
- Beauregard, Haila 2000: R.A. Beauregard, A. Haila, *The unavoidable continuities of the city*, in P. Marcuse & R. Van Kempen (eds.), *Globalizing cities: A new spatial order?* (Oxford, Blackwell), p. 22-36.
- Beck 2000: U. Beck, *The brave new world of work* (Cambridge, Polity Press).
- Behr 2004: J.G. Behr, *Race, ethnicity, and the politics of city redistricting: Minority-opportunity districts and the election of Hispanics and Blacks to city councils* (Albany, State University of New York Press).
- Bell 1954: W. Bell, *A probability model for the measurement of ecological segregation*, in "Social Forces", 32, p. 337-364.
- Bluestone, Harrison 1982: B. Bluestone, B. Harrison, *The deindustrialization of America: Plant closings, community abandonment, and the dismantling of basic industry* (New York, Basic Books).
- Boal 2005: F.W. Boal, *Urban ethnic segregation and scenarios spectrum*, in D.P. Varady (ed.), *Desegregating the city: Ghettos, enclaves, and inequality* (Albany, NY, State University of New York Press), p. 62-78.
- Bolt, Van Kempen, Van Weesep 2009: G. Bolt, R. Van Kempen, J. Van Weesep, *After urban restructuring: Relocations and segregation in Dutch cities*, in "Tijdschrift Voor Economische En Sociale Geografie", 100(4), p. 502-518.
- Brandsen, Van de Donk, Putters 2005: T. Brandsen, W. Van de Donk, K. Putters, *Griffins or chameleons? Hybridity as a permanent and inevitable characteristic of the third sector*, in "International Journal of Public Administration", 28(9-10), p. 749-765.

ISSN 2283-7949

GLOCALISM: JOURNAL OF CULTURE, POLITICS AND INNOVATION

2013, 1, doi: 10.12893/gjcpi.2013.1.5

Published online by "Globus et Locus" in www.glocalismjournal.net

Some rights reserved

- Brenner 2002: N. Brenner, *Decoding the Newest "metropolitan regionalism" in the USA: A critical overview*, in "Cities", 19(1), p. 3-21.
- Burgers, Musterd 2002: J. Burgers, S. Musterd, *Understanding urban inequality: A model based on existing theories and an empirical illustration*, in "International Journal of Urban and Regional Research", 26(2), p. 403-413.
- Burgers 2002: J. Burgers, *De gefragmenteerde stad* (Amsterdam, Boom).
- Burke, Cooper 2000: R.J. Burke, C.L. Cooper, *The organization in crisis: Downsizing, restructuring, and privatization* (Oxford, UK, Blackwell).
- Castells 1989: M. Castells, *The informational city: Information technology, economic restructuring, and the urban regional process* (Oxford, Blackwell).
- Castells 2000: M. Castells, *The information age: Economy, society and culture* (Cambridge, MA, Blackwell).
- Castles 2002: S. Castles, *Migration and community formation under conditions of globalization*, in "International Migration Review", 36, p. 1143-1168.
- Chapple, Lester 2010: K. Chapple, T.W. Lester, *The resilient regional labour market? The US case*, in "Cambridge Journal of Regions, Economy and Society", 3(1), p. 85-104.
- Cho 2011 (April): H. Cho, *Immigration policy and settlement patterns of migrants in South Korea and Singapore: Understanding ethnic and socio-economic class settlement behaviors in Asia*, in "PSA Conference 2011", retrieved October 15, 2012, from http://www.psa.ac.uk/journals/pdf/5/2011/1258_669.pdf
- Coldwell Banker 1987: *National survey of international investment ownership of major office buildings in 19 largest United States* (Boston, Coldwell Banker).
- De Ruijter 1996: A. De Ruijter, *Hybridization and governance* (The Hague, ISS).
- Duncan, Duncan 1955: O.D. Duncan, B. Duncan, *A methodological analysis of segregation indexes*, in "American Sociological Review", 20, p. 210-217.
- Elander, Blanc 2001: I. Elander, M. Blanc, *Partnerships and democracy: A happy couple in urban governance?*, in H.T. Andersen & R. Van Kempen (eds.), *Governing European cities: Social fragmentation, social exclusion and urban governance* (Aldershot, Ashgate), p. 93-124.
- Eriksen 2007: T.H. Eriksen, *Globalization: The key concepts* (Oxford, Berg).
- Espino 2005: N.A. Espino, *Inequality, segregation, and housing market: The US case*, in D.P. Varady (ed.), *Desegregating the city: Ghettos, enclaves, and inequality* (Albany, NY, State University of New York Press), p. 145-157.
- Fainstein 2010: S.S. Fainstein, *The just city* (Ithaca, Cornell University Press).
- Fainstein, Gordon, Harloe 1992: S.S. Fainstein, I. Gordon, M. Harloe, *Divided cities: New York & London in the contemporary world* (Oxford, UK, Blackwell).
- Feitosa, Le, Vlek 2011: F.F. Feitosa, Q.B. Le, P.L. Vlek, *Multi-agent simulator for urban segregation (Masus): A tool to explore alternatives for promoting inclusive cities*, in "Computers, Environment and Urban Systems", 35(2), p. 104-115.
- Fernandez, Smith, Wenger 2007: S. Fernandez, C.R. Smith, J.B. Wenger, *Employment, privatization, and managerial choice: Does contracting out reduce public sector employment?*, in "Journal of Policy Analysis and Management", 26(1), p. 57-77.
- Forster 2006: C. Forster, *The challenge of change: Australian cities and urban planning in the new millennium*, in "Geographical Research", 44(2), p. 173-182.
- Friedman 2005: T.L. Friedman, *The world is flat: A brief history of the twenty-first century* (New York, Farrar, Straus and Giroux).
- Friedmann, Wolff 1982: J. Friedmann, G. Wolff, *World city formation: An agenda for research and action*, in "International Journal of Urban and Regional Research", 6(3), p. 309-344.
- Friedmann 1986: J. Friedmann, *The world city hypothesis*, in "Development and Change", 17(1), p. 69-83.
- Friedmann 1995: J. Friedmann, *The world city hypothesis*, in P. L. Knox & P. J. Taylor (eds.), *World cities in a world system* (Cambridge, Cambridge University Press; original work published 1986), p. 317-331.
- Garrett, Nickerson 2005: G. Garrett, D. Nickerson, *Globalization, democratization and government spending in middle income countries*, in M. Glatzer & D. Rueschemeyer (eds.), *Globalization and the future of the welfare state* (Pittsburgh, PA, University of Pittsburgh Press), p. 23-48.

- Goldsmith 2000: W.W. Goldsmith, *From the metropolis to globalization: The dialectics of race and urban form*, in P. Marcuse & R.V. Kempen (eds.), *Globalizing cities: A new spatial order?* (Oxford, Blackwell), p. 37-55.
- Gray 1996: J. Gray, *After social democracy: Politics, capitalism and the common life* (London, Demos).
- Hamnett 2001: C. Hamnett, *Social segregation and social polarization*, in R. Paddison (ed.), *Handbook of urban studies* (London, Sage), p. 162-176.
- Harvey 1985a: D. Harvey, *The geopolitics of capitalism*, in D. Gregory & J. Urry (eds.), *Social relations and spatial structures* (London, MacMillan), p. 128-163.
- Harvey 1985b: D. Harvey, *The urbanization of capital* (Oxford, Blackwell).
- Harvey 2005: D. Harvey, *From globalization to the new imperialism*, in R.P. Appelbaum & W.I. Robinson (eds.), *Critical globalization studies* (New York, Routledge), p. 91-100.
- Healey, Cameron, Davoudi, Graham, Madanipour 1995: P. Healey, S. Cameron, S. Davoudi, S. Graham, A. Madanipour, *Managing cities: The new urban context* (Chichester, Wiley).
- Hedin, Clark, Lundholm, Malmberg 2012: K. Hedin, E. Clark, E. Lundholm, G. Malmberg, *Neoliberalization of housing in Sweden: Gentrification, filtering, and social polarization*, in "Annals of the Association of American Geographers", 102(2), p. 443-463.
- Huchzermeyer 2011: M. Huchzermeyer, *Cities with 'slums': From informal settlement eradication to a right to the city in Africa* (Cape Town, University of Cape Town Press).
- Kesteloot, Cortie 1998: C. Kesteloot, C. Cortie, *Housing Turks and Moroccans in Brussels and Amsterdam: The difference between private and public markets*, in "Urban Studies", 35(10), p. 1835-1853.
- Kesteloot 2000: C. Kesteloot, *Post-fordist polarization in a fordist spatial canvas*, in P. Marcuse & R. Van Kempen (eds.), *Globalizing cities: A new spatial order?* (Oxford, Blackwell), p. 186-210.
- Kesteloot 2005: C. Kesteloot, *Urban socio-spatial configurations and the future of European cities*, in Y. Kazepov (ed.), *Cities of Europe: Changing contexts, local arrangements, and the challenge to urban cohesion* (Malden, MA, Blackwell Publishing), p. 123-148.
- Kesteloot, De Decker, Manço 1997: C. Kesteloot, P. De Decker, A. Manço, *Turks and their housing conditions in Belgium, with special reference to Brussels, Ghent and Visé*, in A.S. Özüekren & R. Van Kempen (eds.), *Turks in European cities: Housing and urban segregation* (Utrecht, European Research Centre on Migration and Ethnic Relations), p. 67-97.
- Kleinhans 2004: R. Kleinhans, *Social implications of housing diversification in urban renewal: A review of recent literature*, in "Journal of Housing and the Built Environment", 19(4), p. 367-390.
- Kloosterman 1996: R.C. Kloosterman, *Double dutch: Polarization trends in Amsterdam and Rotterdam after 1980*, in "Regional Studies", 30(5), p. 467-476.
- Knox 1991: P.L. Knox, *The restless urban landscape: Economic and sociocultural change and the transformation of metropolitan Washington, DC*, in "Annals of the Association of American Geographers", 81(2), p. 181-209.
- Logan 2000: J.R. Logan, *Still a global city: The racial and ethnic segmentation of New York*, in P. Marcuse & R.V. Kempen (eds.), *Globalizing cities: A new spatial order?* (Oxford, Blackwell, original work published 1997), p. 158-185.
- Madanipour 2003: A. Madanipour, *Social exclusion and space*, in R.T. LeGates & F. Stout (eds.), *The city reader* (London, New York), p. 181-188.
- Madanipour, Cars, Allen 1998: A. Madanipour, G. Cars, J. Allen, *Social exclusion in European cities: Processes, experiences, and responses* (London, Jessica Kingsley).
- Maloutas 2007: T. Maloutas, *Segregation, social polarization and immigration in Athens during the 1990s: Theoretical expectations and contextual difference*, in "International Journal of Urban and Regional Research", 31(4), p. 733-758.
- Marcuse, Van Kempen 2000: P. Marcuse, R. Van Kempen, *Introduction*, in P. Marcuse & R. Van Kempen (eds.), *Globalizing cities: A new spatial order?* (Malden, MA, Blackwell), p. 1-21.



- Marcuse 2005: P. Marcuse, *Enclaves yes, ghettos no: Segregation and the state*, in D.P. Varady (ed.), *Desegregating the city: Ghettos, enclaves, and inequality* (Albany, NY, State University of New York Press), p. 15-30.
- Martin, Miller 2000: P.L. Martin, M. Miller, *Employer sanctions: French, German and US experiences*. *International Migration Papers* (Geneve, International Labour Organisation).
- Martinotti 2005: G. Martinotti, *Employer sanction: French, German and US experience*, in Y. Kazepov (ed.), *Cities of Europe: Changing contexts, local arrangement and the challenge to urban cohesion* (Oxford, Blackwell Publishing), p. 90-108.
- Massey 1984: D.B. Massey, *Spatial divisions of labor: Social structures and the geography of production* (New York, Methuen).
- Massey, Denton 1993: D.S. Massey, N.A. Denton, *American apartheid: Segregation and the making of underclass* (Cambridge, MA, Harvard University Press).
- Massey, IUSSP 2008: D.S. Massey, International Union for the Scientific Study of Population, *Worlds in motion: Understanding international migration at the end of the millennium* (Oxford, Clarendon Press).
- Massey 2008: D.S. Massey, *Globalization and inequality: Explaining American exceptionalism*, in "European Sociological Review", 25(1), p. 9-23.
- McCarthy 2006: E.M. McCarthy, *Handbook of avian hybrids of the world* (Oxford, Oxford University Press).
- Mingione 2005: E. Mingione, *Urban social change: A socio-historical framework of analysis*, in Y. Kazepov (ed.), *Cities of Europe: Changing contexts, local arrangements, and the challenge to urban cohesion* (Malden, MA, Blackwell Publishing), p. 67-89.
- Mollenkopf, Castells 1991: J.H. Mollenkopf, M. Castells, *Dual city: Restructuring New York* (New York, Russell Sage Foundation).
- Monkkonen, Zhang 2011: P. Monkkonen, X. Zhang, *Socioeconomic segregation in Hong Kong: Spatial and ordinal measures in a high-density and highly unequal city*, Working paper No. 2011-3 (Berkeley, Institute of Urban and Regional Development lurd).
- Monkkonen 2011: P. Monkkonen, *Housing finance reform and increasing socioeconomic segregation in Mexico*, in "International Journal of Urban and Regional Research", 63(4), p. 757-772.
- Morgan 1975: B.S. Morgan, *The segregation of socioeconomic groups in urban areas: A comparative analysis*, in "Urban Studies", 12(1), p. 47-60.
- Musterd, Andersson 2005: S. Musterd, R. Andersson, *Housing Mix, Social Mix, and Social Opportunities*, in "Urban Affairs Review", 40(6), p. 761-790.
- Nederveen Pieterse 2001: J. Nederveen Pieterse, *Hybridity, so what?: The anti-hybridity backlash and the riddles of recognition*, in "Theory, Culture & Society", 18(2-3), p. 219-245.
- Nederveen Pieterse 2009: J. Nederveen Pieterse, *Globalization and culture: Global mélange* (Lanham, MD, Rowman & Littlefield).
- Oliver, Montgomery 2000: A.L. Oliver, K. Montgomery, *Creating a Hybrid Organizational Form from Parental Blueprints: The Emergence and Evolution of Knowledge Firms*, in "Human Relations", 53(1), p. 33-56.
- Panitch 1998: L. Panitch, *The state in a changing world: Social-democratizing global capitalism?*, in "Monthly Review", 50(5), p. 11-22.
- Peace 2001: R. Peace, *Social exclusion: A concept in need of definition?*, in "Social Policy Journal of New Zealand", 16.
- Peach 2002: C. Peach, *Ethnic diversity in the city*, in M. Martiniello & B. Piquard (eds.), *Diversity in the city* (Bilbao, University of Deusto), p. 21-42.
- Pendall 2005: R. Pendall, *Does density exacerbate income segregation? evidence from US metropolitan areas*, in D.P. Varady (ed.), *Desegregating the city: Ghettos, enclaves, and inequality* (Albany, NY, State University of New York Press), p. 175-199.
- Preteceille 1994: E. Preteceille, *Cidades globais e segmentação social*, in L.C. Ribeiro & O.A. Santos Junior (eds.), *Globalização, fragmentação e reforma urbana: O futuro das cidades brasileiras na crise* (Rio de Janeiro, RJ, Civilização Brasileira), p. 65-89.
- Ribeiro, Telles 2000: L. Ribeiro, E. Telles, *Rio de Janeiro: Emerging dualization in a historically unequal city*, in P. Marcuse & R.V. Kempen (eds.), *Globalizing cities: A new spatial order?* (Oxford, Blackwell), p. 78-94.



- Ritzer, Ryan 2011: G. Ritzer, J.M. Ryan (eds.), *The concise encyclopedia of sociology* (Chichester, West Sussex, U.K., Wiley-Blackwell).
- Ross 2011: R.J. Ross, *July 6: New Orleans as a Rust Belt City?* in "Metropolitiques", retrieved November 21, 2012, from <http://www.metropolitiques.eu/New-Orleans-as-a-Rust-Belt-City.html>
- Sakoda 1981: J. Sakoda, *A generalized index of dissimilarity*, in "Demography", 18, p. 45-50.
- Sassen 1990: S. Sassen, *Economic restructuring and the American city*, in "Annual Review of Sociology", 16(1), p. 465-490.
- Sassen 1991: S. Sassen, *The global city: New York, London, Tokyo* (Princeton, NJ, Princeton University Press).
- Sassen 2001: S. Sassen, *The global city: New York, London, Tokyo* (Princeton, NJ, Princeton University Press; 2nd ed., original work published 1991).
- Sassen 2006: S. Sassen, *Cities in a world economy* (Thousand Oaks, CA, Pine Forge Press; 3rd ed., original work published 1994).
- Sin 2002: C.H. Sin, *The interpretation of segregation indices in context: The case of P in Singapore*, in "The Professional Geographer", 54(3), p. 422-437.
- Sin 2003: C.H. Sin, *The politics of ethnic integration in Singapore: Malay 're-grouping' as an ideological construct*, in "International Journal of Urban and Regional Research", 27(3), p. 527-544.
- Singapore Department of Statistics 1996: *General household survey 1995: Socio-demographic and economic characteristics, statistical release 1* (Singapore, Department of Statistics).
- Siqueira 2012: M.T. Siqueira, *Urban operations: public-private partnerships globalizing São Paulo*, in "Advances in Education in Diverse Communities: Research, Policy and Praxis", 8, p. 389-413.
- Soja 1985: E.W. Soja, *The spatiality of social life: Towards a transformative re-theorization*, in D. Gregory & J. Urry (eds.), *Social relations and spatial structures* (London, MacMillan), p. 90-127.
- Soja 1989: E.W. Soja, *Postmodern geographies: The reassertion of space in critical social theory* (London, Verso).
- Sullivan 1987: H.J. Sullivan, *Privatization of public services: A growing threat to constitutional rights*, in "Public Administration Review", 47(6), p. 461-467.
- Swyngedouw, Moulaert, Rodriguez 2002: E. Swyngedouw, F. Moulaert, A. Rodriguez, *Neoliberal urbanization in Europe: Large-scale urban development projects and the new urban policy*, in "Antipode", 34(3), p. 542-577.
- Taylor 2000: P.J. Taylor, *World cities and territorial states under conditions of contemporary globalization*, in "Political Geography", 19(5), p. 5-32.
- Taylor 2001: P.J. Taylor, *Specification of the world city network*, in "Geographical Analysis", 33(2), p. 181-194.
- Taylor et al. (2010 (April 13): P.J. Taylor, P. Ni, B. Derudder, M. Hoyler, J. Huang, F. Lu, W. Shen, *Measuring the World City Network: New Results and Developments*, in "GaWC Research Bulletin 300", retrieved from <http://www.lboro.ac.uk/gawc/rb/rb300.html>
- Telles 1995: E.E. Telles, *Structural sources of socioeconomic segregation in Brazilian metropolitan areas*, in "American Journal of Sociology", 100(5), p. 1199-1223.
- Tickell, Peck 2003: A. Tickell, J. Peck, *Making global rules: Globalization or neoliberalism?*, in J. Peck & H.W. Yeung (eds.), *Remaking the global economy: Economic-geographical perspectives* (London, Sage), p. 163-181.
- Tu 1999: Y. Tu, *Public homeownership, housing finance and socioeconomic development in Singapore*, in "Review of Urban and Regional Development Studies", 11(2), p. 100-113.
- Ullah 2012: A. Ullah, *Bangladeshi migrant workers in Hong Kong: Adaptation strategies in an ethnically distant destination*, in "International Migration Iom".
- UN-Habitat 2003: *Global Report on Human Settlements 2003. The Challenge of Slums, Earthscan, London*, part IV "Summary of City Case Studies", p. 195-228.
- Van Criekingen, Decroly 2003: M. Van Criekingen, J. Decroly, *Revisiting the diversity of gentrification: Neighbourhood renewal processes in Brussels and Montreal*, in "Urban Studies", 40(12), p. 2451-2468.



Van Grunsven 2000: Singapore: L. Van Grunsven, *The changing residential landscape in a winner city*, in P. Marcuse & R. Van Kempen (eds.), *Globalizing cities: A new spatial order?* (Oxford, Blackwell), p. 95-126.

Van Kempen, Özüekren 1998: R. Van Kempen A.S. Özüekren, *Ethnic segregation in cities: New forms and explanations in a dynamic world*, in "Urban Studies", 35(10), p. 1631-1656.

Van Kempen 2007: R. Van Kempen, *Divided cities in the 21st century: Challenging the importance of globalisation*, in "Journal of Housing and the Built Environment", 22(1), p. 13-31.

Vandell 1995: K.D. Vandell, *Market factors affecting spatial heterogeneity among urban neighborhoods*, in "Housing Policy Debate", 6(1), p. 103-139.

Wade 1996: R. Wade, *Globalization and its limits: Reports of the death of the national economy are exaggerated*, in S. Berger & R.P. Dore (eds.), *National diversity and global capitalism* (Ithaca, NY, Cornell University Press), p. 60-88.

Wassmer 2005: R.A. Wassmer, *An economic view of the causes as well as the costs and some of the benefits of urban spatial segregation*, in D.P. Varady (ed.), *Desegregating the city: Ghettos, enclaves, and inequality* (Albany, NY, State University of New York Press), p. 158-174.

Waters 1995: M. Waters, *Globalization* (London, Routledge).

Wong 1998: D.W. Wong, *Measuring multi-ethnic spatial segregation*, in "Urban Geography", 19(1), p. 77-87.

Wong 2002: D.W. Wong, *Modeling local segregation: A spatial interaction approach*, in "Geographical and Environmental Modelling", 6(1), p. 81-97.

Wong 2003: D.W. Wong, *Implementing spatial segregation measures in GIS*, in "Computers, Environment and Urban Systems", 27(1), p. 53-70.

Xu, J., Yeh, A., & Wu, F. (2009): J. Xu, A. Yeh, F. Wu, *Land commodification: New land development and politics in China since the late 1990s*, in "International Journal of Urban and Regional Research", 33(4), p. 890-913.

APPENDIX

Values of $SD(m)$ index calculated for global cities of the dataset

City	First time frame		Second time frame		Total percentage of change	Average percentage of yearly change
	Year	Index value	Year	Index value		
1 New York	2000	0.1625	2009	0.1679	3.30 %	0.37 %
2 Hong Kong	2001	0.1226	2006	0.1219	-0.54 %	-0.11 %
3 Singapore	2000	0.0489	2010	0.0475	-2.86 %	-0.29 %
4 Chicago	2000	0.1463	2009	0.1426	-2.54 %	-0.28 %
5 Sydney	2001	0.0872	2006	0.0949	8.84 %	1.77 %
6 Toronto	2001	0.0967	2006	0.0929	-3.93 %	-0.79 %
7 Sao Paulo	2000	0.1823	2010	0.1913	4.97 %	0.50 %
8 Los Angeles	2000	0.1630	2009	0.1608	-1.35 %	-0.15 %
9 Mexico city	2000	0.0464	2010	0.0564	21.43 %	2.14 %
10 Amsterdam	2000	0.0740	2008	0.0885	19.53 %	2.44 %
11 Brussels	2001	0.0380	2008	0.0280	-26.32 %	-3.76 %
12 San Francisco	2000	0.1446	2009	0.1302	-10.01 %	-1.11 %
13 Washington	2000	0.1438	2009	0.1415	-1.66 %	-0.18 %
14 Miami	2000	0.1350	2009	0.1302	-3.57 %	-0.40 %
15 Melbourne	2001	0.0700	2006	0.0735	5.10 %	1.02 %
16 Boston	2000	0.1238	2009	0.1281	3.43 %	0.38 %
17 Dallas	2000	0.1603	2009	0.1612	0.52 %	0.06 %
18 Atlanta	2000	0.1368	2009	0.1270	-7.10 %	-0.79 %
19 Philadelphia	2000	0.1403	2009	0.1438	2.45 %	0.27 %
20 Johannesburg	1996	0.1978	2001	0.1911	-3.41 %	-0.68 %
21 Stockholm	2000	0.0959	2009	0.1071	11.60 %	1.29 %
22 Montreal	1996	0.0670	2006	0.0640	-4.43 %	-0.44 %
23 Houston	2000	0.1598	2009	0.1591	-0.42 %	-0.05 %
24 Berlin	2005	0.0529	2010	0.0460	-12.99 %	-2.60 %
25 Copenhagen	2003	0.2811	2009	0.2649	-5.75 %	-0.96 %
26 Bogota	2003	0.1218	2007	0.1208	-0.82 %	-0.21 %
27 Vancouver	2001	0.0843	2006	0.0840	-0.39 %	-0.08 %
28 Seattle	2000	0.1101	2009	0.1226	11.36 %	1.26 %
29 Auckland	1996	0.0880	2006	0.0960	9.15 %	0.92 %
30 Oslo	2004	0.0518	2010	0.0581	12.16 %	2.03 %
31 Cape Town	1996	0.1309	2001	0.1331	1.71 %	0.34 %
32 Minneapolis	2000	0.1230	2009	0.1215	-1.25 %	-0.14 %
33 Rio de Janeiro	2000	0.1358	2010	0.1022	-24.76 %	-2.48 %
34 Brisbane	2001	0.0514	2006	0.0521	1.22 %	0.24 %
35 Detroit	2000	0.1310	2009	0.1392	6.32 %	0.70 %
36 Denver	2000	0.1120	2009	0.1339	19.56 %	2.17 %
37 Monterrey	2000	0.0361	2010	0.0458	27.09 %	2.71 %
38 St Louis	2000	0.1268	2009	0.1251	-1.36 %	-0.15 %
39 Panama city	2000	0.0927	2010	0.0950	2.45 %	0.24 %
40 San Diego	2000	0.1416	2009	0.1390	-1.79 %	-0.20 %
41 Perth	2001	0.0412	2006	0.0418	1.40 %	0.28 %
42 Cleveland	2000	0.1337	2009	0.1377	2.99 %	0.33 %
43 Calgary	1996	0.0859	2006	0.0819	-4.63 %	-0.46 %
44 Cincinnati	2000	0.1051	2009	0.1097	4.35 %	0.48 %
45 Charlotte	2000	0.1332	2009	0.1326	-0.51 %	-0.06 %
46 Baltimore	2000	0.1480	2009	0.1498	1.22 %	0.14 %

Continue: Values of SD(m) index calculated for global cities of the dataset

City	First time frame		Second time frame		Total percentage of change	Average percentage of yearly change
	Year	Index value	Year	Index value		
47 Adelaide	2001	0.0670	2006	0.0648	-3.23 %	-0.65 %
48 Portland	2000	0.0922	2009	0.0969	5.05 %	0.56 %
49 San Jose us	2000	0.1355	2009	0.1384	2.10 %	0.23 %
50 Kansas city	2000	0.1288	2009	0.1327	3.05 %	0.34 %
51 Phoenix	2000	0.1412	2009	0.1386	-1.83 %	-0.20 %
52 Guadalajara	2000	0.0245	2010	0.0319	30.30 %	3.03 %
53 Rotterdam	2002	0.1363	2009	0.1082	-20.60 %	-2.94 %
54 Tampa	2000	0.1120	2009	0.1157	3.30 %	0.37 %
55 Columbus	2000	0.1688	2009	0.1655	-1.96 %	-0.22 %
56 Indianapolis	2000	0.1256	2009	0.1240	-1.24 %	-0.14 %
57 Pittsburgh	2000	0.1111	2009	0.1148	3.37 %	0.37 %
58 Edmonton	2001	0.0782	2006	0.0787	0.53 %	0.11 %
59 Orlando	2000	0.1047	2009	0.1093	4.34 %	0.48 %
60 Gothenburg	1997	0.0856	2008	0.1058	23.54 %	2.14 %
61 Ottawa	2001	0.0758	2006	0.0795	4.96 %	0.99 %
62 Richmond	2000	0.1353	2009	0.1429	5.60 %	0.62 %
63 Durban	1996	0.1476	2001	0.1526	3.36 %	0.67 %
64 Austin	2000	0.1884	2009	0.1537	-18.42 %	-2.05 %
65 Milwaukee	2000	0.1444	2009	0.1493	3.39 %	0.38 %
66 Wellington	2001	0.0951	2006	0.0942	-0.91 %	-0.18 %

