THE TOP 1% IN U.S. METROPOLITAN AREAS

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ABSTRACT: Increases in U.S. income inequality are driven primarily by rapidly rising incomes of the top 1%. At the national scale, rising inequality is associated with negative consequences for economic growth and stability, a range of social problems and declining social mobility. To date, there is no or little work on the geography of the top 1% and their impact on the cities they inhabit. Using individual income data from the U.S. Census, the paper offers the first detailed analysis of the spatial distribution of the top 1% in the United States. The paper makes use of the range of socio-demographic variables attached to individual records to illustrate that the large majority of the top 1% lives in large cities and that women and ethnic minorities are largely excluded from membership in the top 1%. The widening gap between incomes at the top and bottom will thus lead to increasing gender and ethnic income inequalities. Exploratory analysis of the impact of the top 1% on the bottom 99% suggests that cities with large shares of the top 1% are characterized by higher levels of skill polarization, higher labor force participation rates and lower unemployment rates for those with little formal education and higher median incomes for the better educated. However, the paper shows that higher incomes are outstripped by higher housing costs indicating that any potential advantage trickling down from the top 1% to the bottom 99% is eroded by higher living costs. Preliminary analysis also suggests that cities with a higher share of the top 1% tend to be more segregated with potential implications for the supply, quality, access to and distribution of public local services.

INTRODUCTION

Since the early 1980s, income inequality rose to levels not seen since the Great Depression in the United States. This rise of inequality was driven primarily by disproportionately large increases in income at the top of the income distribution while median and bottom incomes stagnated or rose only modestly (Atkinson et al. 2007; Piketty and Saez 2003; Mishel and Bivens 2011; Piketty 2014). Explanations of the causes and consequences of rising inequality are still contested.

Economists tend to favour "external" causes of increasing inequality such as skill-biased technological change (Katz and Murphy 1992, Author et al. 2003; Levy and Murnane 2004, Author et al. 2008), increasing trade with countries in the global South (Krugman 2008; Rigby and Breau 2010), or immigration of low-skilled labor (Borgas 2003). None of these explanations can account for the rising income shares of the top 1%. Even worse, those theories struggle to make sense of international comparisons (Atkinson et al. 2003) and the historical record on income inequality in the U.S. (Card and diNardo 2002, Goldin and Katz 2008). It is therefore unsurprising that sociologists, political scientists and increasingly economists look for institutional explanations to account for the rising income shares of the rich and super-rich[1]. Labour economists and political scientists believe the Taft-Hartley act initiated the long decline of power of the labor unions and through that, bargaining power of labour against capital (Card 2001; Card and diNardo 2002, Geoghegan 2004; Levy and Temin 2007; Hacker and Pierson 2010, Fleck et al. 2011). This was coupled with a decline in top tax rates (Piketty and Saez 2007; Piketty et al. 2014; Tax Policy Center 2014), liberalisation of global financial flows allowing for tax havens in and outside the U.S. (Shaxson 2011, Palan et al. 2010) and ideological capture of the discourse on social justice and equality (Dorling 2011, 2014; Stiglitz 2012). Noah (2010) summarises those theories and believes that they all offer partial explanations of causes that contribute to rising inequality, although he puts a greater emphasis on institutional explanations. This paper does not address the causes of relative increases of top incomes but takes this rise as historical fact. More important for the purpose of this paper are the potential consequences for society if top incomes increase disproportionally.

Those on the right argue that inequality is necessary and positive for economy and society (Welch 1999) as it creates incentives, makes people try and work harder and so increases productivity and economic growth of national economies. Gains from growth are then supposed to trickle down to benefit everybody. As a result a rising tide is supposed to lift all boats and the trade-off between inequality and economic growth is necessary to increase social welfare in the long run (Okun 1975). This view assumes that hard work is remunerated and that everybody has the opportunity to move up the income hierarchy as long as they work hard. While it may well be the case that some inequality is necessary to incentivise people, the link between incentives-hard work-productivity-remuneration is not observed empirically in the U.S. On the one hand, wages of ordinary workers are no longer linked to productivity increases (Fleck et al. 2011) while on the other, pay rises are not matched by productivity increases for those at the top (Bebchuk and Fried 2004; Bebchuk and Grinstein 2005; Mischel and Sabadish 2012; Philippon and Reshef 2012). The incentive view resonates with the American myth as land of opportunity (Gelman 2010, Mettler 2010). However, social mobility in the U.S. is lower than in almost all other developed economies and there is a strong

[1] There is no agreed convention on how to label different parts of the top of the income or wealth distribution (Hay 2013). Here the top 1% is labelled as "rich" while the top 0.1% and 0.01% are labelled as "super-rich". The top 1% refers to the income that demarcates the richest 1% of individuals from the bottom 99%.

statistical relationship between a country's level of inequality and the lack of social mobility (OECD 2008). In unequal countries the poor have less chance to move up while the rich have less chance to move down. The second problem is that the rising tide does not lift all boats. As Mishel and Bivens (2011) show, between 1979 and 2007, inflation-adjusted average annual incomes (wages and salaries plus interest, dividend and capital incomes) increased by 390% for the top 0.1%, 224% for the top 1%, and only 5% for the bottom 90% of U.S. households. As a result the top 1% captures a much larger fraction of the national economic pie in 2014 than they did in the early 1980s. The data show that increasing inequality is the result of rising top incomes and they suggest that the incentive-productivity-growth argument does not hold. But while it may be the case that higher levels of inequality do not yield positive effects, the question is whether there are negative effects on the economy.

A large number of studies reveal relationships between inequality and economic and social outcomes. The majority of are carried out at the national scale. Contrary to past understanding that inequality incentivizes those at the bottom of the distribution to work harder, this is not the case if people think they live in an unfair society (Stiglitz 2012). The perception of living in an unfair society actually reduces motivation resulting in lower efficiency. Inequality not only reduces motivation but also erodes trust (Wilkinson and Pickett 2009) which may result in political apathy (Hacker and Pierson 2010) and unwillingness to contribute to society through taxes. In addition to the negative social consequences of inequality, once it passes a certain threshold, higher levels of inequality also reduce economic growth and increase economic instability (Galbraith 2012, Ostry et al. 2014). One causal channel works through lower aggregate demand. As the propensity to save is higher among the rich than among the poor, an upward distribution of income will result in lower aggregate demand. A relatively small shift from the top 1% to the bottom and middle income groups could increase economic growth by 2% a year and reduce unemployment rates to 6% (Stiglitz 2012, Piketty et al. 2014). More recent literature goes further and establishes a relationship between inequality and the Great Recession as declining or stagnating income at the bottom and middle of the income distribution was supplemented through loans (often backed by apparent house price increases). Rising private debt loads contributed significantly to the credit bubble which burst eventually in 2007 (Rajan 2010; Galbraith 2012). For cross country studies it can be shown that the financial crisis was indeed more pronounced in debt-driven rather than savings driven accumulation regimes (Onaran and Galanis 2012; Stockhammer 2013; Goda et al. 2014).

Other cross-sectional studies looked at the relationship between inequality and lack of social mobility (OECD 2008), negative physical and mental health implications (Mendes et al. 2008; Wilkinson and Pickett 2009; Dorling 2011), as well as crime and incarceration rates (Wang and Arnold 2008; Wilkinson and Pickett 2009). And finally, if political votes depend on private donations and changes in legislation are strongly influenced by lobbyists, then a highly skewed income distribution towards the top will allow them to capture the political process and so erode democracy (Hacker and Pierson 2010; Stiglitz 2012). While this literature is situated at the national scale, geographers and sociologists pushed forward research on inequality at the urban and regional scales.

First, the literature on social stratification started to explore the link between social and spatial segregation. While segregation by race has declined in most cities, segregation by income increased (Massey and Fischer 2003; Massey 2007; Watson 2009; Reardon and Bischoff 2011). Second, work

on the role of neighbourhood effects on people's opinions, preferences, opportunities and characteristics develops theoretical and empirical links between neighbourhood diversity and belonging (Galster 2010; Finney and Jivraj 2013), attitudes towards the poor and welfare expenditures (Baily et al. 2013) and the impact of neighbourhood poverty on people's life chances (Van Ham et al. 2012; Hedman et al. 2012). Third the literature on gentrification examines the impact of displacement effects on social mix, economic regeneration and opportunity for incumbent residents and the displaced (Jargowsky 1996, Hamnett 2003; Lees 2006). This literature is concerned implicitly with social stratification, social mix of neighborhoods and impact on house prices, but does not discuss explicitly the impact of urban inequality or the share of the top 1% on stratification, segregation, house price development, job opportunities, social attitudes, social mobility, infrastructure development and public resources.

This paper explores links between the literature on inequality and the top 1% at the national scale and the work on social stratification and segregation on the urban scale. The top 1% were chosen rather than the GINI coefficient or other income ratios, because in recent years inequality in the U.S. has been driven by increasing income shares claimed by the top of the income distribution (Piketty and Saez 2003), it entered public discourse through popularisation by the "Occupy" and other social movements and thus warrants further academic research (Breau 2014), and any policy to reduce inequality is likely to be most successful if it targets the top 1% (Dorling 2014). Studying the top 1% rather than the top 5% is justified because the bottom 99% become increasingly homogenous in terms of income while the top 1% are occupying, almost literally, a different planet from them (Hay 2013; Dorling 2014). The question is whether it would be more appropriate to study the top 0.5 or 0.1 percent as differentiation among the top 1% is proceeding rapidly. Unfortunately top-coding of income data from the U.S. Census does not permit a more detailed analysis.

In order to carry out that research, the paper makes use of the integrated public use micro-data series (IPUMS) based on the American Community Survey (ACS) and made available by the Minnesota Population Center (Ruggles et al. 2010). While income data in the ACS are self-reported and probably somewhat less accurate than tax return data, using IPUMS rather than tax returns has a number of advantages: First, it is possible to get a detailed picture of the socio-economic characteristics of the top 1%. Second, it is possible to allocate the top 1% to metropolitan areas and look at the share of the rich in each metropolitan area. Third, we can explore links between the share of the top 1% in metropolitan areas and selected economic and social consequences for the bottom 99% living in those areas.

As a rising income share of this group is to blame for the rise in social inequality more generally, the distribution of the top 1% across metropolitan areas has an impact on inter-urban inequality (Galbraith 2012). Examining geographic differences in the shares of the top 1% is thus important for our understanding of inter-urban inequality more generally. Furthermore, spatial inequality does not only increase at the inter-urban scale but increasingly between neighborhoods within metropolitan areas and the consequences of income segregation on the rest of the urban population warrants attention (Watson 2009).The paper thus provides a first account of the geographic distribution and characteristics of the top 1% across U.S. metropolitan areas and explores links to social and economic characteristics of those cities. Links are explored to (1) Employment, education and wages; (2) House values/rent and affordability; (3) Spatial segregation.

(1) While the literature suggests that a skewed income distribution dampens economic growth and reduces employment opportunities, the negative relationship may not be observed necessarily at the urban scale. There are a number of reasons why a higher share of the top 1% could be linked to lower unemployment rates and higher wages. First of all, the top 1% is generally well educated and rarely unemployed. Everything else equal a higher share of the top 1% should result in lower urban unemployment rates and higher median wages. Second, the top 1% tends to work in high paying service industries such as banking and finance that are dependent on low-paying services to function (Sassen 2001). Furthermore the top 1% is likely to spend some of their income on locally produced products and services that may generate jobs and lower unemployment rates for those with lower levels of educational attainment. Demand for those products and services could drive up prices resulting in relatively higher wages of the bottom 99%.

(2) While the presence of the rich may increase wages of the poor, those wage increases could be nullified by higher prices for accommodation and costs for non-tradable services. House prices and rents can be driven up because the rich can bid up prices for housing (given that the stock of housing tends to be fixed in the short run) at the top of the housing market that can have knock on effects on the lower end of the housing market. They may also use their wealth to buy property as investment objects. This will reduce supply and hence, drive up prices further. Because we know how much people with different education levels in different cities earn and how much they spend on rent/housing we can examine whether the potentially positive impact on jobs and wages is eradicated by the cost for housing.

(3) One of the key issues addressed by the inequality literature at the national scale and the neighbourhood effects/segregation literature is the influence of social context on beliefs, opinion, and behaviour that will inform perceptions of economic and social reality as well as polices to change them (Page et al. 2013; Bailey et al. 2013). Spatial segregation exacerbates and cements differences (Massey 2007). If the top 1% live segregated from the bottom 99% and do not know how they get by, they are less likely to support re-distributive policies, job generation programs or provision of public services. In addition, if they live in well-resourced enclaves and rely disproportionally on private rather than public health and educational facilities, they are more likely to oppose tax rises or spending on those services which benefit the bottom 99% disproportionately. In this sense, spatial segregation can increase future inequality in incomes and standards of living and we thus have to examine whether a large presence of the top 1% is linked to higher levels of segregation in those cities (Breau and Essletzbichler 2013).

DATA AND METHODOLOGY

Because incomes are top-coded in official population and community surveys, until recently work on the top 1% relied exclusively on tax return data (eg. Piketty and Saez 2003). However, since 2003 top code values are set high enough so that the top 1% can be distinguished from the bottom 99%. More specifically top codes are set at the 99.5^{th} percentile in each state. Values at or above this threshold are set to the state mean of the incomes that exceed the threshold. Because none of the state top

codes falls below the national top 1% income threshold we can accurately identify the top 1% in the IPUMS data. However, because we do not know the precise income of each member in the top 1% we cannot calculate their share in total income (Partridge and Weinstein 2013).

The data for this paper are drawn from the pooled 2007-2011 American Community Survey (ACS) supplied by the Integrated Public Use Micro-Data Series (IPUMS) (Ruggles et al. 2010). Each year the ACS is based on a 1% sample representative for the U.S. population. Pooling across five years offers a 5% sample and a similar range of variables as collected previously through the long-form of the U.S. Census including information on pre-tax personal total income or losses in income in the last 12 month. Total income[2] includes wages and salaries, business income, income from investment (interest, royalties, income from trusts, etc.), social security income, welfare payments, retirement income, supplementary income and other income sources. All dollar values are deflated and expressed in constant 2011 dollars.

In order to develop the cut-off for the top 1%, total income rather than wages and salaries was used and only respondents with positive incomes and above 16 years old were included to calculate this threshold. Hence, the 1% threshold was estimated from a (weighted) sample of 212.5 million individuals. This choice was made because rich entrepreneurs, the rich relying on non-wage incomes and rich retirees would not be classified among the top 1% if we would rely on salaries and wages only and because it is income not wages that determine what people can afford. As a result all respondents with incomes above 260,098 US$ become part of the top 1%. This threshold is lower than the one Piketty (2014, p. 292) cites for 2010, but well above his top 5% cut-off point of 150,000 US$. For the purpose of this paper, respondents with incomes above 260,098 US$ are considered part of the top 1% while those with incomes below that threshold are part of the bottom 99%.

The lower threshold for the top 1% in the ACS income data may have a number of reasons. The first is that income is self-reported and that respondents are more likely to solicit precise information on their income return to the IRS. The second may be related to the survey methodology. Each year, the Census Bureau targets 3.54 million (prior to 2011, 2.9 million) housing units that are interviewed over a twelve month period. As a result about 295,000 households are interviewed each month (prior 2011, 242,000). Housing units are sent a mail package and respondents encouraged to fill in the ACS questionnaires online. Those that fail to respond are then contacted again and given the option to fill out a hardcopy of the questionnaire. In a third stage 1 in 3 (in some instances 1 in 2) households are selected for a phone interview. In 2013, the response rate was over 60 percent

[2] Income differs from wealth which includes disposable assets such as owner-occupied housing, real estate, deposits, government bonds and financial securities, corporate stock and mutual funds, cash surrender value of pension plans, trust funds, equity in unincorporated business minus mortgage debt, consumer debt (eg. auto loans) and other debt (eg. educational loans) (Wolff 2012). Changes in wealth are driven primarily by changes in house prices and stock prices, while changes in income are driven largely by changes in wages. Because individuals and households with higher incomes are more likely to accumulate wealth and because wealth allows people to obtain better education leading to better paying jobs, income and wealth are correlated. Both indicators are relevant and complement each other. Because all but the very wealthy are dependent on income for making a living, differences and changes in income are more closely linked to economic growth, social mobility, health and crime outcomes (Wilkinson and Pickett 2009). Furthermore, the lack of wealth data in the ACS means that wealth inequality cannot be addressed in this paper.

(http://www.census.gov/acs/www/methodology/methodology_main/). Because of the sampling strategy it may be the case that rich households are less likely to fill out the survey. The Census Bureau does adjust non-responses through sample weights, but more careful research needs to be conducted through systematic comparison of IRS and ACS data. Another potential problem is the allocation of individuals to particular addresses. Especially the rich tend to own second homes in Florida, Wyoming or Long Island and some of them may be erroneously allocated to those places. And finally, because of the smaller sample size and higher error rates of monthly ACS surveys compared to the decennial census, information for small areas (below 65,000 individuals) are not released for annual data files. However, since the following analysis is based on the five-year pooled sample and the smallest geographic entities are PUMA areas, the results should not be biased. The most likely outcome of using the ACS is an under-estimation of income inequality, especially in areas with a relatively high percentage of the top 1%. This needs to be kept in mind when comparing areas.

While there are potential problems with ACS based income measures, one advantage of using IPUMS rather than tax return data is the large number of socio-economic and demographic variables contained in IPUMS that allows us to produce a more detailed socio-economic profile of the top 1%. In addition, respondents can be attributed to metropolitan and PUMA areas (the smallest area for which data are reported in IPUMS that include at least 100,000 and usually not more than 200,000 residents) so that we can obtain an understanding of the geography of the top 1%.

PROFILING THE TOP 1%

Table 1 compares the social and demographic characteristics of the top 1% with those of the bottom 99%. Not surprisingly members of the top 1% tend to be well educated, male, white, married (with spouse present), over 45 years old and live in cities (primarily suburbs). Especially the uneven distributions of gender and race stick out with women, African Americans and Hispanics being strongly underrepresented among the top 1%. The largest occupational group among the top 1% are surgeons and physicians (13.6%), followed by CEO's (10.8%), lawyers (8.8%), miscellaneous managers (7.1%), financial mangers (2.9%) and accountants and auditors (2.8%). The high share of surgeons and physicians among the top 1% seems surprising and they are likely to drop out if we only were to look at the 0.1 or 0.01 percent (Breau 2014) where CEOs make up the biggest shares.

INSERT TABLE 1 HERE

High incomes appear to be passed on to children in form of better education. Only 3.4% of 15-19 year old children with a parent among the top 1% are not in education compared to 13.4% of children with none of the parents in the top 1%. Even more striking is the difference in private school education. 33.0% of 6-17 year olds of children from the top 1% are enrolled in private schools compared to only 9.6% of children with both parents from the bottom 99%. In addition, school quality is related strongly to property taxes and house prices. Given that median annual property taxes of the top 1% are 6,500US$ and 3.5 times higher than median property taxes paid by the

bottom 99%, educational inequalities between the children of the top 1% and bottom 99% are likely to be even more pronounced than the private schooling figures suggest. And given that educational attainment is strongly linked to future income, a higher share of the top 1% will lead everything else equal, to lower social mobility (OECD 2008).

WHERE DOES THE TOP 1% LIVE?

According to the global cities literature, we would expect the rich to be concentrated in the largest cities. Table 2 offers a summary of the top 1% by city size classes. In line with the global cities literature, over 50% of the top 1% of the U.S. population lives in the 25 cities with more than 2 million inhabitants (compared with 38.6% of the total population). A further 18.7% lives in the 43 cities greater than 750,000 and less than 2 million inhabitants. The share of the top 1% decreases with city size, although the share of the top 1% is greater than 1 in cities between 250,000 and 400,000. This is due to Stamford, CT (which can be considered a rich suburb of New York City) where 8% of the population belong to the top 1%. Excluding Stamford the value would drop to slightly above 0.8. The decline in the top 1% share along city size classes is also reflected in a decline in the Theil[3] coefficient and the GE(2) measure. Large cities tend to be more unequal than smaller cities. However, larger cities also have higher median wages, higher labor force participation rates and lower poverty shares than smaller cities. Unemployment rates are fairly similar across city size classes.

INSERT TABLE 2 HERE

As for the U.S. as a whole, the vast majority of the rich is white. The share of minorities among the top 1% is higher in large cities than in small cities. However, this is a reflection of the ethnic composition of those cities. The share of whites among the top 1% in the largest cities is 1.5 times higher than the shares of whites among the bottom 99% in those cities. All ethnic minorities are underrepresented in the top 1% in the largest cities. Asians are overrepresented among the top 1% in all but the largest cities and have the best chance to make it into the top 1% in non-metropolitan and small metropolitan areas. African Americans are underrepresented in all areas. The share of African Americans in the top 1% is only 1/4th of their share among the bottom 99%. Hispanics are only slightly more likely to make it into the top 1% than African Americans. Hence, while the shares of ethnic minorities among the top 1% are higher in the largest cities, the probabilities of them making it into the top 1% are lower in those cities.

In terms of educational attainment, the shares of members of the top 1% with BA, Masters and PhD are higher in the largest cities, while the share of those with an advanced degree other than Masters or PhD is higher in smaller cities. The differences in those shares reflect differences in the

[3] The Theil index and GE(2) (half the square of the coefficient of variation) are members of the Generalized Entropy class indices of inequality that are commonly used in inequality studies (eg. Breau 2014; Jenkins 2009). Compared with the Theil, the GE(2) is more sensitive to income differences at the top of the income distribution.

educational profiles of those cities for the populations as a whole. The main exception is that BAs in rural areas have a higher probability to make the top 1% than BAs in the largest cities.

And finally, some interesting patterns in terms of private schooling emerge. First of all, the top 1% is more likely to send their children to private schools if they live in central cities. In the largest cities, almost two thirds of children from the top 1% are sent to private schools. In the suburbs, less than 30% of children are sent to private schools. The discrepancy lessens with declining city size. While the share of rich central city children sent to private schools decreases with city size, those of rich suburban children increases. For the bottom 99% those shares decline only modestly with city size for central cities and suburbs. It appears that the top 1% are able to compensate for under-resourced public schools in central locations by sending their children to private schools, while the bottom 99% rely on public educational institutions in those areas.

While the functional specialization of cities related to their size is correlated with their share of the top 1%. that correlation is not perfect. Excluding Stamford the correlation coefficient between the share of the top 1% and the logarithm of metropolitan population size is 0.46. It is thus useful to have a closer look at the geography of the rich. Figure1 displays the share of the top 1% for each PUMA area and shows that PUMA areas with high shares of the rich are located in or next to large metropolitan areas including those in the Rustbelt (eg. Detroit).

FIGURE 1 ABOUT HERE

The "richest" fifteen metropolitan areas (the metropolitan shares of the top 1% in parentheses) are Stamford, CT (8%), San Francisco-Oakland-Vallejo, CA (3.1%), Naples, FL (2.8%), Danbury, CT (2.7%), West Palm Beach-Boca Raton-Delray Beach, FL (2.2%), San Jose, CA (2.1%), Bridgeport, CT (2.0%), Nassau Co, NY (1.8%), Newark, NJ (1.8%), Orange County, CA (1.8%), Washington DC/MD/VA (1.8%), New York-Northeastern NJ (1.8%), Boston MA (1.7%), Portland, ME (1.7%), Bergen-Passaic NJ (1.7%) and Oakland, CA (1.7%). Seven of those metropolitan areas are in or in commuting distance from New York City. Hence, while surgeons and physicians are the occupational group with the highest percentage of people among the top 1%, the financial sector of New York City has a major impact on the concentration of rich in New York and surrounding cities and counties.

While rich PUMA areas are located throughout the U.S. there appears to be a concentration of rich PUMA areas next to or in the large cities on the East coast (Boston, New York, Washington DC) and the West Coast (San Francisco, Los Angeles). In order to identify whether those clusters of rich PUMA areas are significantly different relative to U.S. averages, Local Indicators of Spatial Autocorrelation (LISA) were calculated providing a measure of spatial autocorrelation for individual PUMA areas within the U.S. as a whole (Anselin 1995). The Local Moran Statistic *I* for PUMA area *i* is

$$I_i = z_i \sum_j w_{ij} z_j \qquad for\ j \neq i \qquad (1)$$

where the percentage of the rich for each PUMA area *i*, x_i , are normalized ($z_i=[x_i-\bar{x}]/s$) and the spatial weights matrix (**W**) is row-standardized so that the sum of weights along any row equal 1. The local Moran statistic for area *i* is thus the product of the normalized value of the share of the top 1% in PUMA area *i* and the average normalized top 1% shares in the neighbouring PUMA areas. Neighbours are defined as PUMA areas that share a common border (Queen contiguity). High LISA values indicate spatial clustering of similar values while low LISA values indicate spatial clustering of dissimilar values. Figure 2 maps those LISA values that are statistically significant at the 0.01 level. Significance is assessed by comparing the observed distribution of the top 1% income shares with a conditional random assignment (Anselin 1995).

FIGURE 2 ABOUT HERE

Dark red areas indicate areas with relatively high shares of the top 1% surrounded by PUMA areas with relatively high top 1% shares while dark blue areas indicate PUMA areas with relatively low top 1% shares surrounded by areas with relatively low top 1% shares. Light red areas indicate PUMA areas with relatively high top 1% shares surrounded by PUMA areas with relatively low top 1% shares, while light blue indicate areas with relatively low top 1% shares neighboured by areas that generally have higher than average top 1% shares. High income clusters are labelled on the map. New York includes Danbury, CT, Bridgeport, CT, and Stamford CT, while the San Francisco Bay Area includes San Jose and Santa Cruz and Los Angeles includes Oxnard-Simi Valley. Clusters with low percentages of the top 1% emerge in some areas of the rustbelt, the Appalachians, along the Mississippi, rural Georgia and New Mexico. Because it is more difficult to identify PUMA areas with low percentages of the top 1% in metropolitan areas, Figure 3 offers higher resolution maps for metropolitan areas with clusters of PUMA areas with low percentages of the top 1% within metropolitan areas. No detailed maps for Atlanta and Houston are provided in Figure 3 as there are no clusters of areas with relatively low percentages of the top 1% in Houston and because the pattern of spatial inequality is readily observable for Atlanta in Figure 2.

FIGURE 3 ABOUT HERE

Boston is characterized by a big cluster of PUMA areas with high percentages of the top 1% and one PUMA area in South Boston with a relatively low share of the top 1%. In Chicago we observe a “rich” cluster in the North and a “poor” cluster in South. The pattern in Detroit is more complex. The City of Detroit is characterized by a large cluster of PUMA areas with low percentages of the top 1%, while the top 1% tends to reside in some Northern suburbs. In Los Angeles the rich cluster in the Western parts (Oxnard-Simi Valley) and along the Hollywood Hills, while clusters with low percentages of the top 1% are found in Central L.A. and parts of San Bernardino County. The San Francisco Bay Area is characterized by a large cluster of high income areas centered on Silicon Valley (San Jose and Santa Cruz) but also has areas of relatively low percentages of the top 1% east of the Bay. In Washington DC, the top 1% spread out from the Western part of the city towards the rich suburbs of Maryland

and Virginia. The most complex geography emerges in New York. There are a number of distinct "rich" and "poor" clusters. The top 1% cluster in (1) Manhattan and Park Slope (Bronx County); (2) the Northern parts of Westchester County, Stamford, Danbury and Bridgeport, CT; (3) New Jersey in proximity to Princeton; and (4) parts of Long Island. There are also a number of clusters of low percentages of the top 1% in (1) Bronx county; (2) Parts of Queens and Brooklyn; and (3) New Jersey in vicinity of Jersey City and Elizabeth. The spatial separation of the rich and poor in metropolitan areas like New York, Los Angeles and Detroit is confirmed by high dissimilarity[4] and low interaction indices (see Figure 4 below). After offering a broad overview of the characteristics and geography of the top 1%, the following section explores the relationship between the share of the top 1% and potential implications for the bottom 99%.

THE SHARE OF THE TOP 1% AND THEIR POTENTIAL IMPACT ON THE BOTTOM 99%

(1) Education, employment and income

The share of the top1% (Stamford is excluded from the calculations) is positively correlated with the Theil index (0.61), GE(2) (0.54), labor force participation rate (0.35) and median income (0.58), but negatively related to poverty rates (-0.42) and unemployment rates (-0.22). Notice that the Theil and and GE(2) are negatively correlated to unemployment rate (though not statistically significant), labor force participation rates, median incomes and positively related to poverty rates. In general, more unequal cities (with high Theil and GE(2) coefficients) are those with higher poverty rates, lower participation rates and lower median incomes, but that people in cities with a relatively high percentage of the top 1% are those with lower poverty and unemployment rates and higher labor force participation rates and median incomes. The negative correlation coefficients between poverty rates and the share of the top 1% are the result of higher median wages in those cities because poverty thresholds are not adjusted by cost of living (see note Table2). Once we control for differences in median income, the relationship between poverty rates and the share of the top 1% turns positive (although it is not statistically significant)[5]. In other words, a higher share of the top 1% does not lower urban poverty rates once we control for metropolitan differences in median income. On the other hand, the positive relationship between the two inequality indices and poverty rates persist after controlling for wage differences.

Table 3 ABOUT HERE

While there appears to be a positive effect of the share of the top 1% on employment opportunities and wages, the question is what kinds of jobs are generated and how widely potential benefits are spread among the populations in those cities. In order to answer this question, Table 4 reports the correlation coefficients between the share of the top 1% in a metropolitan area and the location

[4] For a precise definition of the dissimilarity and interaction indices please see equations (2) and (3) below.
[5] A simple linear regression model with metropolitan poverty rates as independent and the metropolitan share of the top 1% and logarithm of the median income as independent variables yields a parameter estimate of 0.71 with a t-value of 1.54 for the share of the top 1%. The estimate is positive but not statistically significant.

quotients, labor force participation rates, unemployment rates and median incomes for the metropolitan area for each skill/education level[6]. A location quotient >1 for a particular education level means that the population with this education level is overrepresented in a metropolitan area. The correlation coefficients are depicted for the whole sample of metropolitan areas (minus Stamford) and for those with 2 million or more inhabitants only. The results tend to be consistent although the level of association is much higher if we look at the top 25 metropolitan areas only. Columns 2 and 6 reveal that the share of the highly educated (BA degree or higher) is positively correlated with the metropolitan shares of the top 1%. This is unsurprising as we know that that the highly educated are overrepresented among the top 1% (see Table 1). More interesting is the distribution at the bottom of the educational distribution. The share of the population with very low levels of education (prior to high school) tends to be positively (although insignificantly) correlated with the share of the top 1%, while the share of those with Grade 10 up to an Associate's degree are significantly negatively correlated with the share of the top 1% suggesting increasing educational polarization in metropolitan areas with relatively large shares of the top 1%.

TABLE 4 ABOUT HERE

In order to explore the potential impact of the share of the top 1% on the bottom 99%, the labour force participation rates, unemployment rates and median wages were calculated for the bottom 99% only and correlated with the share of the top 1% in a metropolitan area. Labor force participation rates for the low skilled are higher in metropolitan areas with a high percentage of the top 1% but this is not the case for higher education groups. This may result from the fact that costs are higher in cities with a high share of the top 1% forcing those with little education to pick up low paid jobs, or from increased job opportunities for the unskilled that are available in those cities. The second conjecture is supported in part by lower unemployment rates for the unskilled in cities with higher shares of the top 1%. So not only are the unskilled overrepresented in the population and more likely to participate in the labour force, but this group is also less likely to be unemployed in cities with a higher share of the top 1%. Unemployment rates are not negatively correlated with top 1% shares for people with better skill levels, although the group with Grade 10 and Grade 12 (without high school diploma) education have lower unemployment rates in large cities with higher shares of the top 1% (see Table 4, column 8). And finally, Table 4 suggests that groups with higher education levels receive higher median wages in cities with a high share of the top 1% while this is not the case for the groups with less education. In other words, in places where the rich live, wages for the higher skilled tend to be higher, but this does not trickle down to those groups with low education levels. Because the correlation coefficients are based on a single cross section it is impossible to infer causality. We do not know if the rich generate jobs for low skilled workers or whether the rich and unskilled happen to live in cities with economic structures that provide jobs for the unskilled and the highly skilled.

[6] Although the level of education is not directly related to a person's skill level, it is a good proxy for skill.

(2) Housing

Whether or not better economic opportunities or higher wages translate into higher standards of living depends also on the cost of living. Higher wages among the highly skilled may drive up prices for the services they provide and demand. In order to examine this hypothesis it would be necessary to obtain detailed data on prices of services, products but also consumption patterns for families or individuals with different educational backgrounds. This kind of information is not available in the American Community Survey. However, a big expenditure item is accommodation. Rents and housing costs could be driven up in cities with higher median wages. And this information is available in the ACS.

TABLE 5 ABOUT HERE

Table 5 reports the correlation coefficients of the share of the top 1% with selected owner cost, rent, and two income/housing cost variables (median monthly household income / selected monthly owner cost and median monthly household income / monthly rent) by skill level for all metropolitan areas and for the top 25 metropolitan areas separately. Both, selected owner costs and monthly rent, are positively correlated with the share of the top 1%. Hence, while median wages and household incomes are higher in metropolitan areas with a large share of the top 1%, so are cost for accommodation. The question is whether costs outstrip higher incomes. Columns 4-5 and 8-9 demonstrate that the income/cost ratios for all but one education group are negatively correlated with the share of the top 1% and this negative relationship is strongest for the higher skilled groups.

(3) Segregation

The literature on segregation proposes that group differences are intensified if groups are spatially segregated (Massey 2007). If the top 1% does not know how the bottom 99% lives their members are less likely to agree to re-distributive policies. Furthermore, if the rich live in enclaves they are able to develop exclusive infrastructures (backed by higher property taxes or private services) and rely less on government provided services and thus, are even more likely to oppose re-distributive policies. In order to examine whether cities with a high percentage of the top 1% are more segregated than cities with lower percentages, the dissimilarity and interaction indices are calculated for the 25 largest cities. Usually, segregation is measured at the census tract or block level. Unfortunately the smallest geographic unit for the IPUMS data are PUMA areas. AS PUMA areas contain at least 100,000 people, income variation within PUMA areas may be substantial and the results have to be interpreted with caution. It is likely that segregation at the tract or census block level is considerably higher than at the PUMA area level.

FIGURE 4 ABOUT HERE

Massey and Denton (1988) identified five dimensions of segregation. Here, we are interested in how equally the rich and poor are distributed across metropolitan areas and how likely it is that the top 1% interact with the bottom 99%. For this purpose the dissimilarity index and the exposure/interaction index are calculated. The dissimilarity index D is defined as:

$$D = \frac{1}{2}\sum_{i=1}^{n}\left|\frac{x_i}{X} - \frac{y_i}{Y}\right| \qquad (2)$$

where x_i and y_i are the number of individuals in the top 1% and bottom 99% in PUMA area *i* and X and Y are the number of individuals in the top 1% and bottom 99% for the metropolitan area as a whole. The dissimilarity index measures the degree of departure from an even residential distribution. It computes the number of minority group members who would have to change neighborhoods (here defined as PUMA areas) to achieve an even distribution and expresses that quantity as a proportion of the number that would have to change areas under conditions of maximum unevenness. The index varies between 0 and 1. Only changes of minority members from areas where they are overrepresented to areas where they are underrepresented affect the index.

The second dimension of segregation is exposure or interaction and refers to the degree of potential contact between groups within neighborhoods of a city. It measures the extent to which groups must physically confront one another because they share a residential area. Rather than measuring segregation as a departure from an abstract ideal of "evenness", exposure indices depend on the share of each group in the city. Minority groups may be distributed equally across different areas in a city but at the same time experience relatively little exposure to the majority group members if they constitute a relatively large share of the population in the city. Hence, we would expect the top 1% to be less likely to interact with the bottom 99% in cities where they constitute a relatively large share of the urban population. More specifically the interaction index is defined as

$$xP^*y = \sum_{i=1}^{n}\left[\frac{x_i}{X}\right]\left[\frac{y_i}{t_i}\right] \qquad (3)$$

where x_i, y_i and t_i are the number of individuals in the top 1%, the number of individuals in the bottom 99% and the total population in a PUMA area *i*. The index varies between 0 and 1 and gives the probability that a randomly drawn member of the top 1% shares a neighbourhood with a member of the bottom 99%.

Figure 4 reports the dissimilarity and interaction indices for the largest 25 metropolitan areas. The size of the bubble is determined by the share of the top 1%[7]. In general, cities with larger shares of the top 1% tend to be more segregated. The correlation coefficients of the top 1% shares with the dissimilarity and interaction indices are +0.25 and -0.77 respectively. The correlation coefficient between the dissimilarity and interaction index is -0.73. The most segregated large city with low interaction and high dissimilarity is New York, a city with a high share of the top 1%. This was expected given the patterns of spatial clustering observed in Figure 3. Other highly segregated cities are Detroit, Los Angeles, St. Louis, San Francisco and Washington DC. Detroit, Los Angeles and St. Louis are characterized by highly uneven spatial distributions of the top 1% and the bottom 99% but their shares of the top 1% are relatively small compared to the other metropolitan areas. In San

[7] In order to raise visibility of the differences between top 1% shares they have been raised to the power of four. This means that the size of the bubbles exaggerate differences in top 1% shares. The correlation coefficients are based on actual top 1% shares.

Francisco and Washington DC the share of the top 1% is high and their interaction indices are relatively small. On the other hand, Riverside-San Bernardino, Orlando, Minneapolis, Tampa, Pittsburgh and Portland, OR are cities with relatively low levels of segregation (high interaction and low dissimilarity indices) and relatively low shares of the top 1%. The results indicate a relationship between the share of the top 1% and spatial segregation[8] although the analysis needs to be carried out for census tract and block levels to arrive at corroborate these results.

CONCLUSION

Using Census data provided by the University of Minnesota's Integrated Public Use Microdata Series (IPUMS) (Ruggles et al. 2010) this paper offered a summary of the detailed social-demographic characteristics and geography of the top 1% in the United States. The analysis confirms that educated, white, married, over 45 year old men living in outlying districts of metropolitan areas are highly over-represented among the top 1%. 40% of the top 1% is made up of Surgeons and Physicians, CEOs, lawyers and financial managers and accountants and 70% of them live in cities with more than 750,000 inhabitants (over 50% in the 25 cities with more than 2 million people). Hence, if incomes of the top 1% pull away even further from the bottom 99% we can expect increasing levels of gender and ethnic income inequalities. This result is consistent with research documenting increasing ethnic disparities in wealth accumulation (McKernan et al. 2013). A third of the top 1% (two thirds in large central city areas) send their children to private schools. In addition, median property taxes of the top 1% are 3.5 times higher than those of the bottom 99%. As local schools are funded, in part, through property taxes, children of the rich attend better resourced schools. And as educational attainment is correlated with future income, existing levels of inequality are so maintained or exacerbated over time.

Metropolitan areas with higher percentages of the rich are those with higher labour force participation rates and lower unemployment rates among the less educated and higher wages for the better educated. The low and highly educated are over-represented while those from the mid-educational groups are underrepresented in cities with higher shares of the top 1%. Better economic circumstances in form of higher participation and lower unemployment rates for the least educated and higher wages for the well educated in those cities seem to be eroded by higher housing costs especially for groups with better education. And finally, cities with higher shares of the rich also tend to be cities that are more spatially segregated which may translate into lower levels of support for distributional policies and expenditure on public services such as education and health facilities.

The analysis of this paper was exploratory with the intention to construct a socio-demographic and geographical profile of the top 1% and opens up a number of avenues for future research. First, in order to calibrate income data from the ACS, it would be useful to compare IRS based income estimates with those from the ACS and the long-form census. Because it is likely that incomes reported to the Census are lower than those reported to the IRS, we can expect that actual income inequalities are even higher than those reported in this paper. Second, while high shares of the top 1% seem to generate economic benefits for the lower skilled in form of lower unemployment rates

[8] Notice that only the relationship to the exposure index is statistically significant. This result holds even after controlling for population size and the number of PUMA areas in a metropolitan area.

and the better skilled in form of higher wages, the causal channels generating those relationships need to be explored. Do the rich generate job opportunities for the less educated or do they simply co-habit cities with better job opportunities? While the analysis could be advanced with publicly available data, we would also need information on expenditure patterns of the top 1% and detailed urban input-output tables to ascertain whether they do indeed generate jobs for the lower skilled. While the rich may indeed generate a "serving class" the main point is though why we would want a large part of the population "serving" only 1% of the population instead of providing socially beneficial services for everybody (as public rather than private teachers, social care workers, public park keepers, street cleaners, public rather that private child care workers, etc). Third, while the analysis suggests a relationship between the percentage of the rich and housing costs, more detailed information is required on how the top 1% affect those costs. We know that house prices vary for many reasons and to isolate the effects that the top 1% have on rising house prices may prove difficult (although there is no question that a rich, international group of people influences property prices in cities such as London or New York (Dorling 2014)). Furthermore, house prices are only part of people's expenditure and it would be important to examine if and how prices of other necessities (in particular non-tradable services) are driven up by the presence of the top 1%. Fourth, the analysis on segregation needs to be carried out at the tract and block level to reduce the impact of income heterogeneity within PUMA areas on segregation measures. Furthermore, information from social attitude surveys are required to develop and test theoretical links between spatial segregation and social attitudes and behaviours of the rich and poor as currently developed by the neighbourhood effect literature (eg.Bailey et al. 2013; Finney and Jivraj 2013). This work needs to extend to the relationship between spatial segregation and provision of public services in different parts of metropolitan areas and their impact on the incomes and life chances of the bottom 99%. Two of the obvious areas to investigate are education and health services. Fifth, this analysis only focused on one point in time. This is useful for exploratory purposes but insufficient for identifying the causal processes leading to those metropolitan differences in inequality in the first place. Annual ACS data are available for the largest counties and metropolitan areas and could be used to examine changes in income inequality over time.

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FIGURES AND TABLES:

The source for all Figures and tables is the pooled 5-year (2007-2011) American Community Survey sample from IPUMS. (https://usa.ipums.org/usa/)

Table 1: Socio-demographic characteristics of the Top 1%

	Top 1 %	Bottom 99%
Number of obs.		
Gender (percent female)	16.80	51.70
Age group(percent)		
<36	6.73	35.0
36-45	24.85	17.48
46-55	33.63	18.16
56-65	23.47	14.03
66-75	7.86	8.31
Education (percent)		
Bachelor's degree	31.23	16.67
Master's degree	18.12	6.57
Professional degree beyond BA	25.00	1.55
PhD	6.27	1.04
Marital Status (percent)		
Married, spouse present	80.16	49.19
Married, spouse absent	1.69	2.48
Separated	1.14	2.31
Divorced	7.69	11.65
Widowed	2.24	6.74
Occupations (percent)		
Physicians and surgeons	13.55	0.37
Chief executives	10.79	0.60
Lawyers	8.75	0.56
Miscellaneous managers	7.07	1.97
Financial managers	2.85	0.66
Accountants and Auditors	2.82	1.29
Race/ethnicity (percent)		
White	86.82	68.94
Black	2.64	11.31
Hispanic	3.79	13.14
Asian	5.68	4.53
Location(percent)		
Rural	11.3	26.0
Suburbs	63.1	50.1
Central city	25.6	23.9
Education of children		
percentage not enrolled in school (15-19 year old)	3.43	13.43
percent in private school (6-17)	33.04	9.64
Area related(all values in US$)		
Median property taxes	6,500	1,850
Median house values	625,000	187,500
Median selected monthly owner costs	2,717	1,106
Median rent	1,525	679

Table 2: Metropolitan inequality and selected characteristics of the Top 1%

			City size class					
			>2 mill	<2mill-750k	<750k-400k	<400k-250k	<250k	non-metro
Number of metropolitan areas			25	43	51	53	111	0
Population share			38.61	17.68	9.05	5.46	5.93	23.27
Theil			0.513	0.476	0.469	0.484	0.461	0.448
GE(2)			0.837	0.755	0.745	0.782	0.727	0.709
Top 1%	share of urban population		1.356	1.062	0.883	1.012	0.664	0.513
	share of US top 1%		51.440	18.651	8.120	5.591	4.020	12.178
Labour Force Participation rate			73.11	72.90	71.85	71.14	70.63	67.80
Unemployment rate			8.81	8.59	8.92	8.54	8.34	8.49
Median income (in US$)			29350	26426	25247	24936	23313	22000
Poverty rates			14.56	15.89	16.37	17.62	19.31	18.87
Poor as share of U.S. Poor			34.26	17.12	9.02	5.86	6.98	26.76
Selected characteristics of top 1%								
Ethnicity	White %		84.94	85.51	90.48	89.15	90.01	92.19
	African American %		2.89	2.97	2.21	2.17	2.15	1.75
	Asian %		6.83	6.11	3.81	4.47	3.80	2.61
	Hispanic %		4.28	4.24	2.49	3.34	3.07	2.30
Education	BA %		32.58	32.51	29.72	31.21	25.68	26.43
	Masters %		20.97	17.00	15.86	18.20	11.36	11.46
	Other degree %		24.68	24.78	27.86	25.77	30.50	22.60
	Phd %		20.97	17.00	15.86	18.20	11.36	11.46
Private Schooling (in %)		citywide	33.39	35.87	36.01	32.83	31.67	24.61
		central cities only	62.32	48.08	48.55	48.21	43.31	n.a.
		suburbs only	28.65	33.02	31.80	33.97	39.48	n.a.
Ownership (in US$)		Median property tax	7,500	5,250	4,450	6,500	4,050	3,050
		Median house value	875,000	625,000	450,000	625,000	450,000	350,000

Table 3: The top 1% and metropolitan inequality, poverty and labor market outcomes

	Theil	GE2	Poverty rate	Unemployment rate	Participation Rate	Median income
Top 1% share	0.61**	0.54**	-0.43**	-0.22**	0.35**	0.58**
Theil		0.93**	0.25**	-0.07	-0.16**	-0.05
GE2			0.24**	-0.02	-0.19**	-0.15**

Notes: ** Statistically significant at the 0.01 level. The poverty rate is based on the Poverty Status variable and expresses each family's total income as a percentage of (family size dependent) poverty thresholds established by the Social Security Administration. A person living below the poverty threshold (Poverty value <100) is defined as poor. The poverty rate of a city is calculated as the percentage of poor divided by all people living in a metropolitan area. The poverty thresholds are not adjusted for variations in cost of living. Hence, cities with higher median family incomes will have lower poverty rates even if cost of living in those cities is higher. Once we control for differences in median income, the share of the top 1% is positively related to urban poverty rates (see footnote 2).

Table 4: Correlation coefficients between the top 1% shares and employment characteristics by skill/education level of the bottom 99%

	All metro areas (n=283)				Metropolitan areas with Population > 2 million (n=25)			
Skill / education level	LQ	LF PR	UR	MWage	LQ	LF PR	UR	MWage
No schooling completed	-0.08	0.27**	-0.13*	0.06	0.31	0.44*	-0.45*	0.30
Nursery school to grade 4	0.02	0.21**	-0.06	-0.01	0.29	0.47*	-0.40*	-0.04
Grade 5 or 6	0.06	0.25**	-0.03	0.04	0.25	0.45*	-0.37+	0.11
Grade 7 or 8	-0.15*	0.28**	-0.12*	0.05	0.14	0.54**	-0.39+	0.28
Grade 9	-0.18**	0.26**	-0.06	0.11+	-0.02	0.42*	-0.50*	0.20
Grade 10	-0.30**	0.05	-0.12*	0.08	-0.50*	-0.03	-0.52**	0.43*
Grade 11	-0.30**	-0.03	-0.05	0.15*	-0.55**	-0.30	-0.27	0.28
12th grade, no diploma	-0.07	0.20**	-0.11+	0.12*	-0.19	0.17	-0.53**	0.40*
High school graduate or GED	-0.39**	0.23**	-0.03	0.26**	-0.66**	0.25	-0.33	0.37+
Some college, but less than 1 year	-0.40**	0.14*	0.02	0.39**	-0.65**	-0.18	-0.05	0.57**
1 or more years of college credit, no degree	-0.15*	0.11+	0.01	0.35**	-0.27	-0.23	-0.21	0.52**
Associate's degree, type not specified	-0.22**	-0.01	0.05	0.31**	-0.51**	0.03	-0.18	0.53**
Bachelor's degree	0.58**	-0.13*	0.05	0.39**	0.68**	0.27	-0.08	0.64**
Master's degree	0.57**	-0.08	0.25**	0.39**	0.62**	0.37+	0.08	0.59**
Professional degree beyond a BA	0.68**	-0.02	0.05	0.24**	0.70**	0.18	0.08	0.63**
Doctoral degree	0.28**	-0.00	-0.01	0.19**	0.65**	0.49*	0.15	0.60**

Notes: LQ=Location quotient of 16-70 year olds for each education level: LQ>1 means that metro population is over-represented in this education level relative to nation as a whole; LF PR = Labor force participation rate; UR = Unemployment rate; MWage = Median Wage (only those with >=48 weeks of work were included to calculate annual median wages, because usual hours of work are not reported in ACS); LFR, UR, MWage are for each skill level in each metropolitan area. Education levels: Prior to Grade 9 means no High School qualification; Grade 9 – 12 attended High School; Statistically significant at the 0.01 (**), 0.05 (*), 0.1 (+) levels.

Tab le 5: Correlation coefficients between the share of the top 1% and ownership costs, rent and affordability of the bottom 99% per skill level

	All metro areas (n=283)				Metropolitan areas with Population > 2 million (n=25)			
Skill/education level	OC	Rent	Income /OC	Income /Rent	OC	Rent	Income / OC	Income /rent
No schooling completed	0.53**	0.46**	-0.20**	-0.09	0.63**	0.52**	-0.20	-0.02
Nursery school to grade 4	0.31**	0.39**	-0.11+	-0.16**	0.52**	0.49*	-0.24	-0.06
Grade 5 or 6	0.39**	0.29**	-0.13*	-0.13*	0.61**	0.51**	-0.20	0.10
Grade 7 or 8	0.42**	0.40**	-0.24**	-0.08	0.66**	0.46*	-0.19	-0.06
Grade 9	0.28**	0.44**	-0.19**	-0.09	0.64**	0.48*	-0.44*	-0.11
Grade 10	0.36**	0.36**	-0.21**	-0.08	0.61**	0.46*	-0.31	-0.05
Grade 11	0.26**	0.45**	-0.29**	0.00	0.55**	0.40+	-0.55**	-0.06
12th grade, no diploma	0.43**	0.29**	-0.22**	-0.13*	0.60**	0.45*	-0.39+	-0.18
High school graduate or GED	0.40**	0.46**	-0.39**	-0.35**	0.61**	0.46*	-0.45*	-0.22
Some college, but less than 1 year	0.43**	0.46**	-0.36**	-0.17**	0.60**	0.50*	-0.41*	-0.28
1 or more years of college credit, no degree	0.45**	0.49**	-0.38**	-0.22**	0.61**	0.53**	-0.42*	-0.15
Associate's degree, type not specified	0.46**	0.45**	-0.37**	-0.22**	0.61**	0.48*	-0.45*	-0.23
Bachelor's degree	0.51**	0.53**	-0.34**	-0.29**	0.62**	0.58**	-0.41*	-0.20
Master's degree	0.50**	0.48**	-0.36**	-0.25**	0.63**	0.61**	-0.40*	-0.34*
Professional degree beyond a bachelor's degree	0.51**	0.33**	-0.34**	-0.19**	0.66**	0.70**	-0.46*	-0.27
Doctoral degree	0.48**	0.35**	-0.33**	-0.16**	0.63**	0.66**	-0.38+	-0.19

Notes: OC = Selected owner cost; Rent = Monthly rent; Income / OC = Monthly median household income (of owners) divided by selected monthly OC; Income / Rent = Monthly median household income (of renters) divided by monthly rent; The sample are all bottom 99% households; The educational level of a household is based on the education level of the household head. Statistically significant at the 0.01 (**), 0.05 (*), 0.1 (+) levels.

Figure 1: The geographic distribution of the top 1%

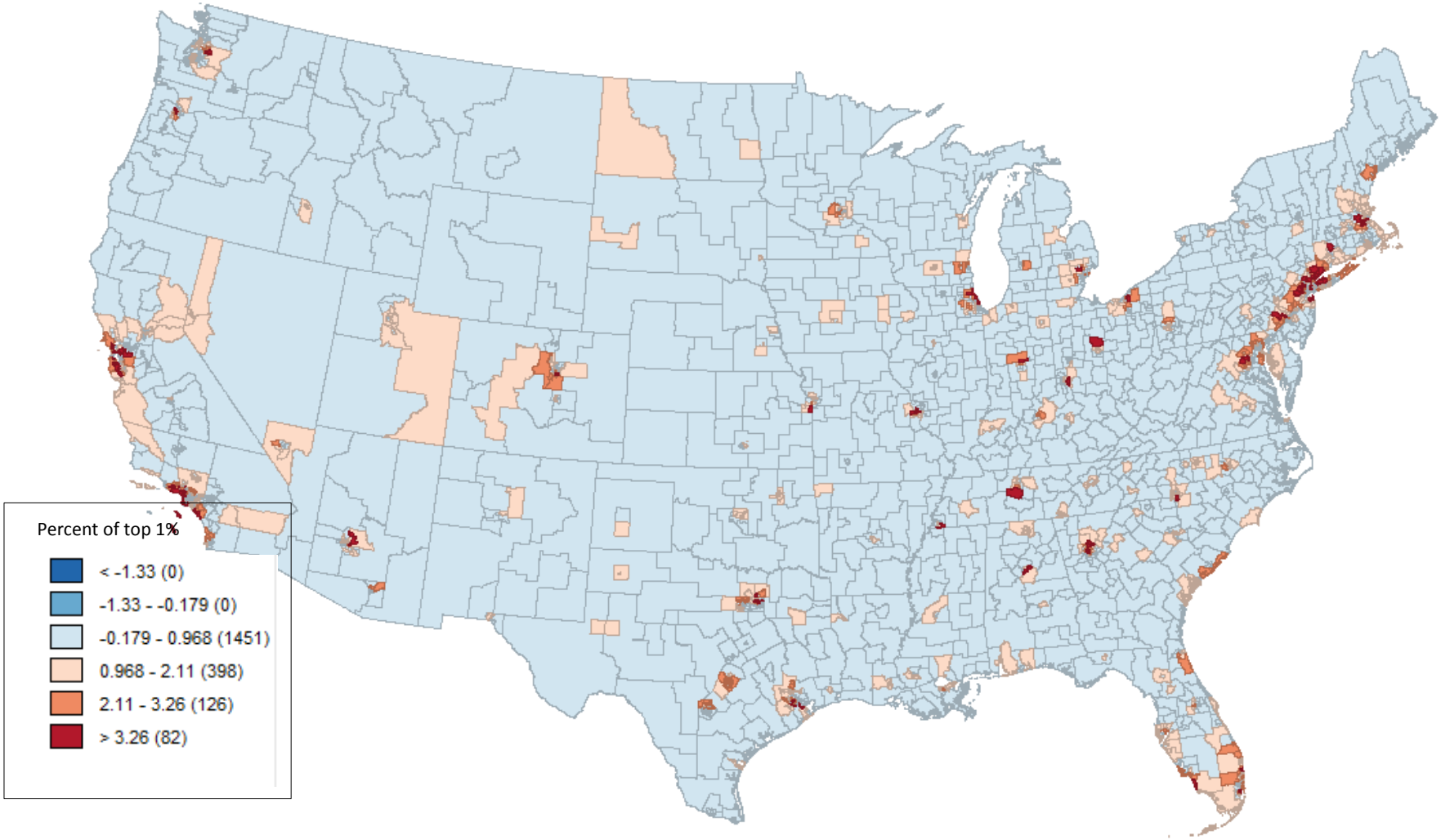
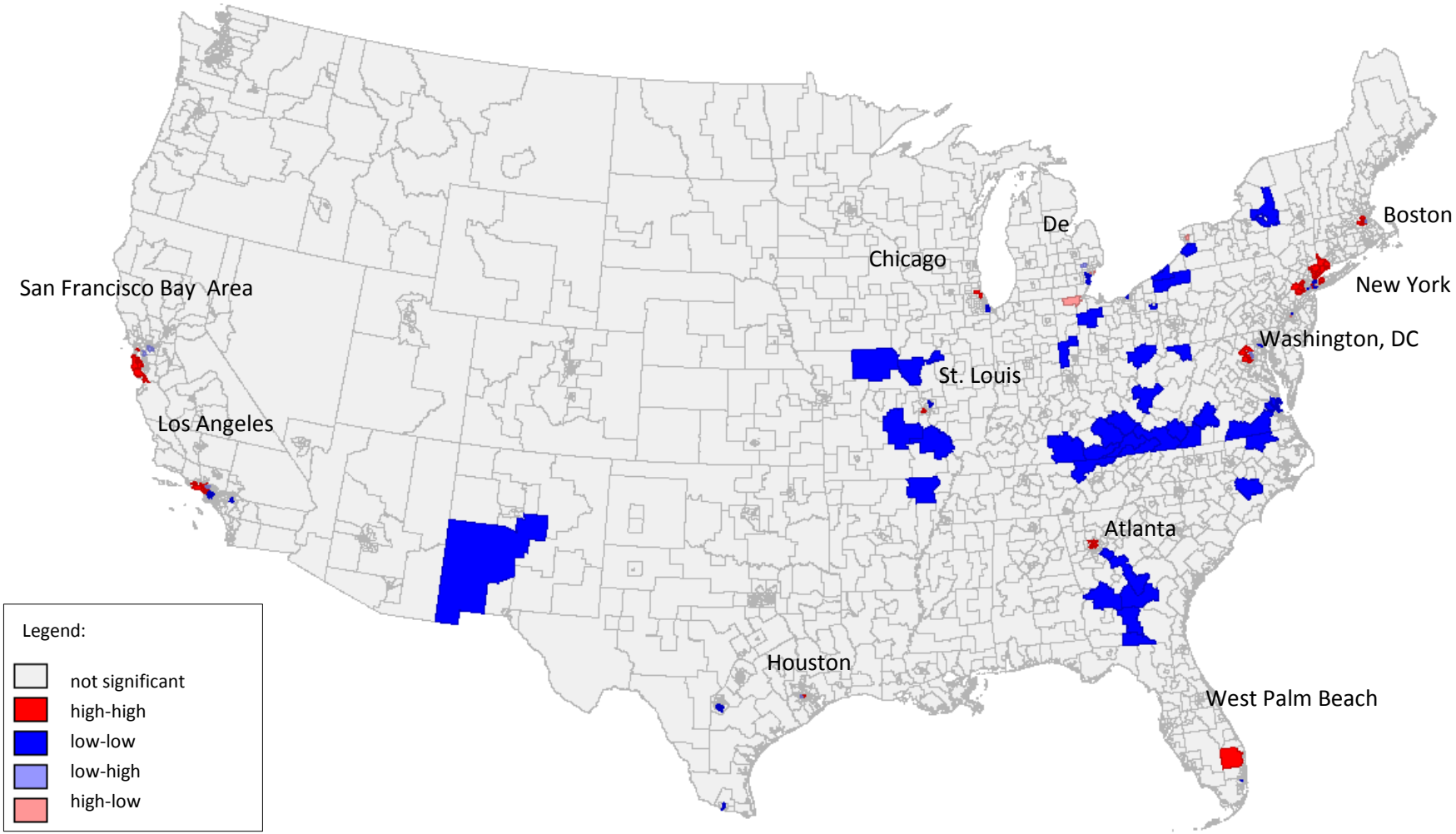
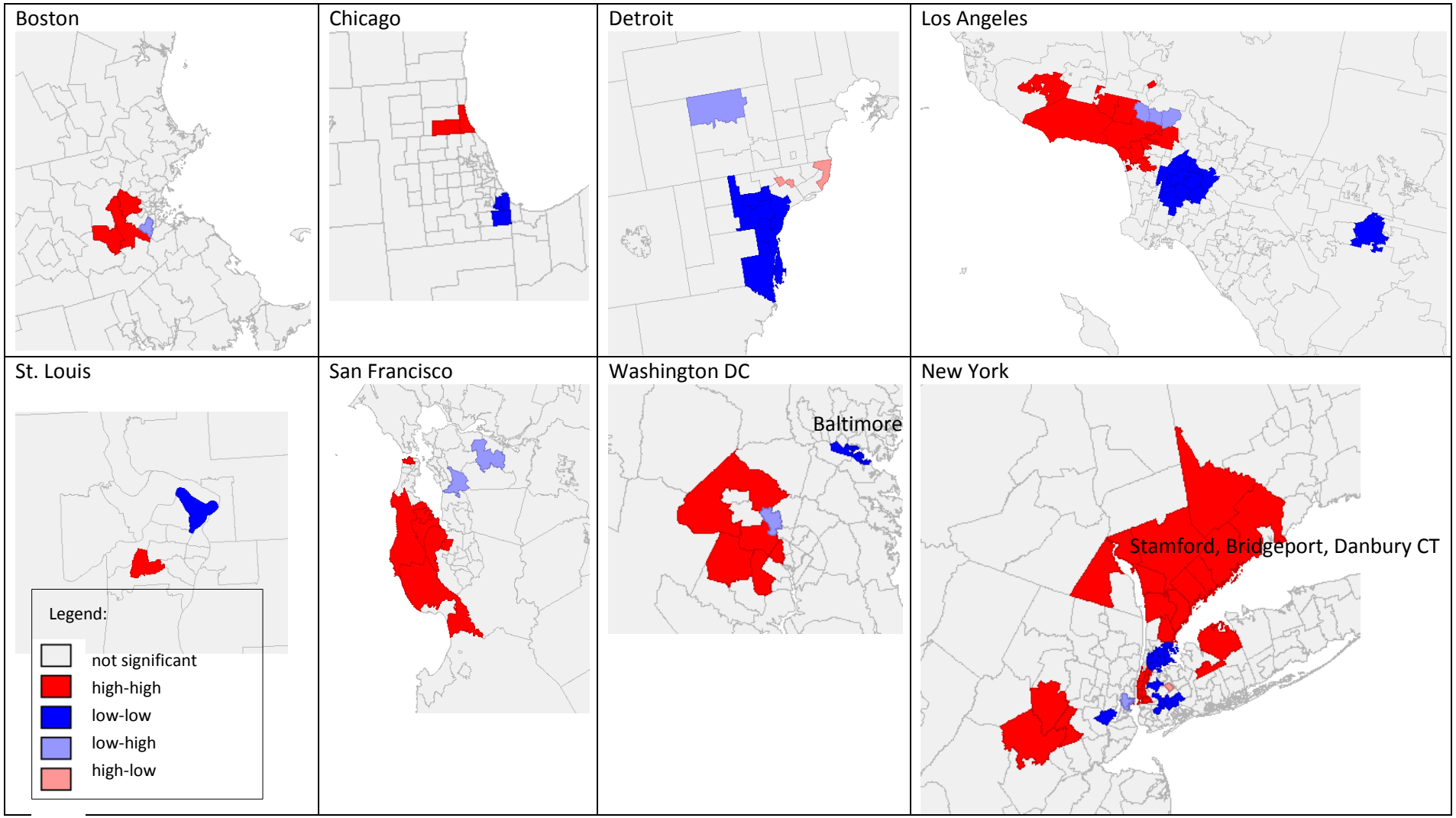


Figure 2: Clusters of metropolitan areas with high and low shares of the top 1%



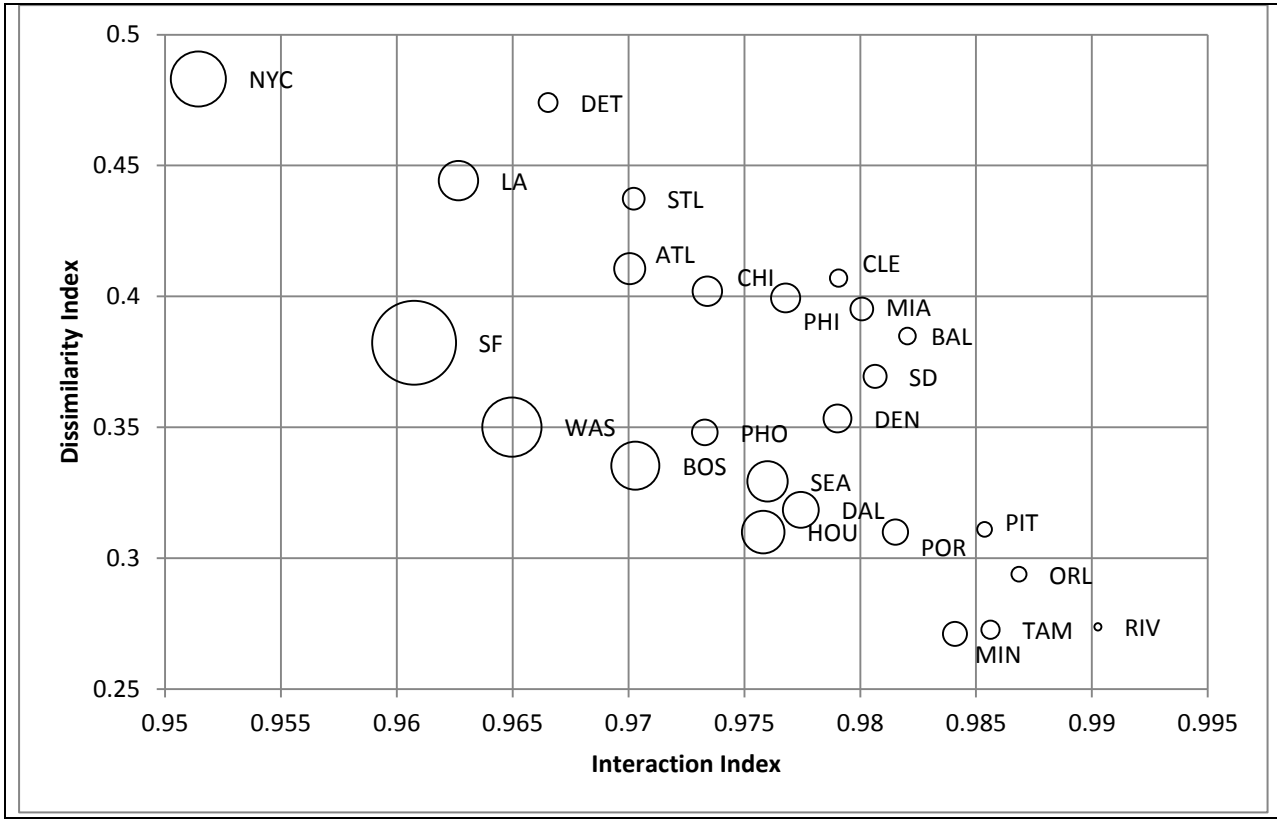
Notes: p=0.01; Number of permutations=999; High-high: Relatively high values surrounded by relatively high values; low-low: relatively low values surrounded by relatively low values; low-high: relatively low values surrounded by relatively high values; high-low: relatively high values surrounded by relatively low values.

Figure 3: Clusters in and around metropolitan areas



Notes: p=0.01; Number of permutations=999; High-high: Relatively high values surrounded by relatively high values; low-low: relatively low values surrounded by relatively low values; low-high: relatively low values surrounded by relatively high values; high-low: relatively high values surrounded by relatively low values.

Figure 4: Share of the top 1% and income segregation



Correlation coefficients:
Dissimilarity index with Top 1% share: 0.25
Interaction index with Top1% share: -0.77
Dissimilarity index with interaction index: -0.73

Note: The size of the bubble reflects the share of the top 1% in a metropolitan area; In order to improve visibility the top 1% shares were raised to the power of 4.