

UNVEILING THE URBAN DIVIDE:

An exhaustive study of income inequality and segregation
in the Netherlands (2003-2021)

Abstract

This paper presents a longitudinal assessment of economic inequality and residential segregation of all Dutch urban areas between 2003 and 2021. Using microdata covering the entire population of the country, we differentiate between the segregation of poverty and the segregation of affluence by computing indicators for every percentile of the income distribution. Calculations also distinguish between net and gross income to evaluate the impact of social transfers and taxation. Although results show a general increase in the levels of inequality, there is considerable variance on its evolution across the country and segregation remains relatively stable. In addition, our findings confirm that the rich are usually more spatially clustered than the poor, but the latter is becoming increasingly segregated while the former is not. Notably, whereas taxation and social transfers reduce income inequality, they also paradoxically exacerbate segregation.

Keywords: inequality, segregation, income, taxation, spatial analysis.

Introduction

Urban economic segregation is seemingly on the rise. In the last decades, many cities from a myriad of countries record an increasing divergence in the places of residence of the poor and the rich (Musterd et al., 2017; van Ham et al., 2021). This pattern parallels the expanding levels of economic inequality that characterises several societies nowadays (OECD, 2015). Intuitively, growing economic disparities should increase the differences in purchasing power among the top and bottom earners, in a way that the former may outbid the latter in seeking the most desirable locations within a city. This notion of a general increase of segregation linked to growing inequality has been termed as the Global Segregation Thesis (Van Ham et al., 2021).

Yet, the extend of inequality and segregation is highly variable among cities and countries (Comandon & Veneri, 2021; Glaeser, Resseger & Tobio, 2009). Rather than observing homogenously rising levels of economic and spatial disparities, their evolution appears to be very much dependant on the particularities of the specific urban areas and jurisdictions (Fujita, 2016; Musterd et al., 2017). Elements ranging from taxation and housing policies to transportation and cultural values, which are considerably different in each context, are likely to shape inequality and segregation. Moreover, their association is far from a settled question. Despite their conceptual linkage (there cannot be economic segregation without economic inequality), some cities present diverging evolutions of the two phenomena, such as the case of Cairo (Mohamed & Stanek, 2021), Tokyo (Fujita & Hill, 2016) or many South African cities (Turok, Visagie & Scheba, 2021).

However, exhaustive estimations of inequality and segregation that compare different types of urban areas across time are unfortunately scarce. Foremostly, studies often focus on capitals and prominent cities (see, for example, Musterd et al., 2017; van Ham et al., 2021; Veneri et al. 2021). For the case of the Netherlands, much of the research has focused has centred upon Amsterdam (Haandrikman et al., 2023; Musterd et al., 2017; Sleutjes, Ooijevaar & De Valk, 2019; van Ham et al., 2021; see Comandon & Veneri, 2021 and Veneri et al., 2021 for exceptions). Consequently, other cities, where much of the population resides, are often overlooked. In addition, analysis often rely on decennial census data (Musterd et al., 2017; Veneri et al., 2021) and sometimes need to employ occupation and education as proxies of income (see, among others, Maloutas, 2016; Marcińczak et al., 2015; López Martínez & Ceballos Mina, 2021). The general unavailability of geo-coded and longitudinal microdata about all sorts of income also impedes other the study of important dimensions that deserve attention. Notably, it hinders research on the segregation of the poor and the segregation of the rich as distinct phenomena, which evidence suggests they are (Reardon & Bischoff, 2011). Moreover, it has also occluded analyses on the effect of taxes on economic and spatial disparities at the urban level. These research gaps are worrisome given the considerable threat that inequality and segregation pose to social cohesion.

This article then presents an exhaustive examination of economic inequality and segregation for all urban areas of the Netherlands that aims to consider these concerns. Taking advantage of the access to annual and geo-coded microdata for the entire population of the country between 2003 and 2021, it firstly estimates, on a yearly basis, the levels of economic inequality and urban segregation in every municipality and urban conurbation. Afterwards, it computes the income distribution and the profile of segregation of every metropolitan area disaggregated to the percentile unit. Lastly, it estimates the impact on taxes and social transfers both on inequality and on segregation. This paper then addresses the following research questions:

1. What are the levels of income inequality and income segregation in the urban areas of the Netherlands? How have they evolved from 2003 to 2021?
2. How is inequality and segregation different across the income distribution of all urban areas of the Netherlands? What is the evolution of these differences between 2003 and 2021?
3. What is the impact of the state redistribution on inequality and segregation? What is their distinct effect across time and across the income distribution?

The next section titled "Theoretical framework" discusses the concepts of inequality and segregation and their significance for Dutch urban cities in the form of hypotheses. The following "Literature review" section provides an overview on research performed on the topic. The "Methodology" section describes the data employed in this article and the computations performed for extracting the indicators of inequality and segregation. In the "Results" section, the findings are shown for the set of Dutch urban areas under study. In the final "Conclusion" section, implications of the results are discussed.

Theoretical framework:

Inequality, understood as the uneven distribution of economic resources among the population, has been a pervasive reality in much of urban history. Such a circumstance is likely not a coincidence: the transition from nomadism to sedentism constituted the necessary condition that enabled the emergence of large economic disparities (Kohler *et al.*, 2017). Millennia ago, the development of farming and livestock not only enabled fixed and large human settlements that had never existed before, but also the unprecedented concentration of resources in a few hands. In contrast with Palaeolithic times, where personal wealth was limited to the one that could be materially transported within an itinerant way of life, sedentarism made material accumulation logically possible. The emergence of the first cities of the world was then accompanied by notable increases in inequality (Basri & Lawrence, 2020; Price & Bar-Yosef, 2010).

Nonetheless, urbanization should not necessarily imply greater economic disparities. Indeed, evidence shows that economic inequality is highly variable across time and places (Kohler *et*

al., 2017; Piketty, 2014). On the one side, this phenomenon is affected by exogenous and apparently random factors, which range from the effect of technological changes (Acemoglu, 2002) to the surrounding presence of large domesticable mammals (Kohler *et al.*, 2017). On other side, whether a community becomes unequal is, ultimately, dependant on the social structures that shape the distribution of income and wealth. Consequently, elements such as taxation or the welfare state, among others, are likely to greatly influence urban disparities in resources (Musterd *et al.*, 2017; Piketty, 2014). Even if cities may be structurally inclined to inequality, its actual realization is, in short, contingent.

The materialization of social differences in income and wealth into distinct residential patterns is even more convoluted. *A priori*, understanding segregation as the uneven distribution of population groups throughout space based on their economic status would make it conceptually impossible if, in the first place, there were no differences in resources among people. However, the way through which segregation emerges out of inequality is not immediately obvious. On the one side, segregation may be a result of the spontaneous interaction of individuals. For example, city dwellers show heterogenous housing preferences depending on income and prefer living close to people with similar backgrounds (Huang *et al.*, 2023; Xu *et al.*, 2019). On the other side, segregation may be actively pursued as a tool of separation between social classes. Along these lines, many urban landscapes have been intentionally designed to segregate people based on different attributes, with financial differences frequently being a primary factor. Various methods have been used to achieve this: for example, zoning laws that restrict multi-family homes in wealthier areas, thus limiting affordable housing options (Rothwell & Massey, 2010), a deliberate focus on placing social housing in specific areas (Van Gent & Hochstenbach, 2020) and the development of structures like highways and gated communities, which serve as tangible divides between affluent and less wealthy areas (Atkinson & Flint, 2004; Mitchell & Lee, 2014). Similarly to the case of inequality, whether a city becomes segregated is therefore also a matter of the social and institutional engines that fuel, or not, that outcome.

This notion also implies that richer households are more likely to experience greater segregation than the poorer counterparts. As the more affluent individuals have a greater financial capacity to bid for the most desirable locations in the housing market, they are also more likely to monopolize certain areas of the city (Reardon & Bischoff, 2011). Moreover, seeking social homogeneity in the residential environment may be rational: it may serve as a form of social reproduction of the upper class through cultural and symbolic distinctions between the poor and the rich (Bourdieu, 1989) and to avoid the negative so-called neighbourhood effects of more impoverished areas (Galster, 2012). In addition, selecting neighbourhoods where neighbours are rich alike may provide a better match with the taxes and services that each social group desires (Tiebout, 1956).

Conversely, these processes do not happen in the void. Instead, how income and space is allocated to different social groups is actively shaped by the state. Interestingly, taxes and social transfers are likely to boost the income of the poorest segments of society at the expense of the wealthiest. In a similar manner, state redistribution may mechanically impact on economic segregation if its intensity is heterogenous not only throughout the social ladder, but also throughout space. For example, if certain income groups living in specific neighborhoods are more likely to receive social benefits due to their place of residence, the state may directly impact on segregation levels.

All together, these theoretical propositions imply the five following hypotheses that will be explored in this article:

1. Dutch cities record certain inequality and segregation as a natural by-product of urbanization and the general disparities of resources in a marketized society.
2. Levels of inequality and segregation vary considerably across time and urban areas due to different policies, cultural values, and other additional factors.
3. Households with larger incomes are more spatially segregated than poorer ones due to their greater financial capacity to monopolize the most desirable locations in the city.
4. The degree of urban inequality and segregation is altered by state intervention via taxes and social transfers.
5. State action modifies the extent of inequality and segregation in Dutch urban areas differently for distinct income groups depending on how and in which direction redistribution is performed.

Literature review:

Recent research shows a general increase in the levels of urban economic segregation in several areas of the world (Van Ham *et al.*, 2021). All sorts of cities from areas as different as the European Union (Musterd *et al.*, 2017), the US (Bischoff & Reardon, 2014), Australia (Sydes & Wickes, 2021), and China (Pan *et al.*, 2021), together with several cities in the Global South (Feitosa *et al.*, 2021; Fernández-de-Córdova, Moschella & Fernández-Maldonado, 2021; Monkkonen *et al.*, 2018), have generally recorded enhanced spatial inequalities along income lines in the last decades. This trend has coincided in time with the rise of within-country economic inequality due to globalization, de-unionization, and reduced taxation (Piketty, 2014; OECD, 2015). Such a circumstance, together with the seemingly ubiquitous rise of urban divisions of economic nature, has led to the development of the so-called Global Segregation Thesis (Van Ham *et al.*, 2021). This thesis states that rising residential segregation is fuelled by the general intensification of income and wealth disparities. The main suggested causality is intuitive: as the rich accumulate a greater proportion of the total income and wealth, they are able to outbid the

poor more easily when buying or renting in the most desirable areas of the city (Mutgan & Mijs, 2023; Reardon & Bischoff, 2011; Watson, 2009).

In addition, urban economic segregation has been suggested to go beyond being a spontaneous consequence of inequality produced by the market (Rodriguez, 2020). Instead, the so-called rent theory of urban land (González, 2009) states that the inner functioning of the market is structured on the explicit desire of the richest segments of society to live distant from the poor. Consequently, a share of the land and housing prices stems from a segregation monopoly secondary rent that affluent individuals choose to pay as a way of achieving social distinction. Thus, income inequality may generate urban segregation also through a conscious and voluntary attempt of the richest households to materialise social hierarchies into space. This idea has been incorporated into some of the models of the quantitative literature through the concept of neighbourhood status hierarchies (Reardon & Bischoff, 2011) or explicitly as part of the rent theory of urban land (Rodriguez, 2020). In addition, this notion is consistent with a fact observed in many countries: high-income individuals tend to live more segregated from the rest of society than low-income groups (Comandon *et al.*, 2018).

Notwithstanding, levels of inequality and segregation seem not to always follow these patterns. In general, the extent of urban economic segregation differs substantially among and within countries (Comandon & Veneri, 2021), as well as income inequality varies among cities (Glaeser, Resseger & Tobio, 2009). Contrary to expectations, increasing income disparities do not always lead to more segregation. Research has shown this is the case of cities in Egypt (Mohamed & Stanek, 2021), Japan (Fujita & Hill, 2016), South Africa (Turok, Visagie & Scheba, 2021), and Spain (Dominguez, Leal & Goytre, 2016), among others. Part of the paradox of observing increased levels of income disparities coupled with decreased urban segregation, or vice versa, may be related to the strong role of contextual factors of every city (Musterd *et al.*, 2017). For instance, elements such path dependency trajectories or topographic peculiarities may highly shape the evolution of segregation. Likewise, rises of inequality may, initially, produce so-called segregation paradoxes (Sýkora, 2007; Sýkora, 2009): as gentrification and suburbanization bring high income households into traditionally low-income areas, some extent of social mixing that reduces segregation in the short term may be recorded. The complexity of urban segregation has been then theorised as a multi-factor model (Musterd *et al.*, 2017; van Ham *et al.*, 2015). Within this framework, economic inequality is the "*sine qua non condition for the development of spatial divisions*" (Musterd *et al.*, 2017, p.1066), but other factors must be considered as well.

In the specific case of the Netherlands, the existence of a relatively robust welfare state has been linked to reduced inequality as well as diminished segregation (Musterd & Ostendorf, 2013; Musterd & Ostendorf, 2012). Local features such as the role of social housing have also been

proposed to play a role in alleviating segregation (Musterd *et al.*, 2017; Musterd & van Gent, 2015). However, it has also been described to be under a process of “residualization” (Van Gent & Hochstenbach, 2020), by which it becomes a service catered exclusively to low-income households in concentrated areas of the city. This trend may have substantial implications on the levels of urban economic segregation. In the meanwhile, analysis of the evolution of segregation in the last years present mixed results: whereas some studies identify a decrease (Musterd *et al.*, 2017), others record an increase at least regarding certain socio-economic groups (Sleutjes, Ooijevaar De Valk, 2019). Much of the research has focused on the case of Amsterdam, where economic segregation appears to be little when compared to other European cities (Haandrikman *et al.*, 2023; Musterd *et al.*, 2017) and to the degree of ethnic segregation (Sleutjes, Ooijevaar & De Valk, 2019). Simultaneously, the city shows emerging signs of gentrification and touristification that, in the long term, may decrease social mixing (Boterman & van Gent, 2022). In the wider country, economic disparities seem to be in the rise, although income inequality remains much more stable than wealth inequality (Van Babel & Frankema, 2017).

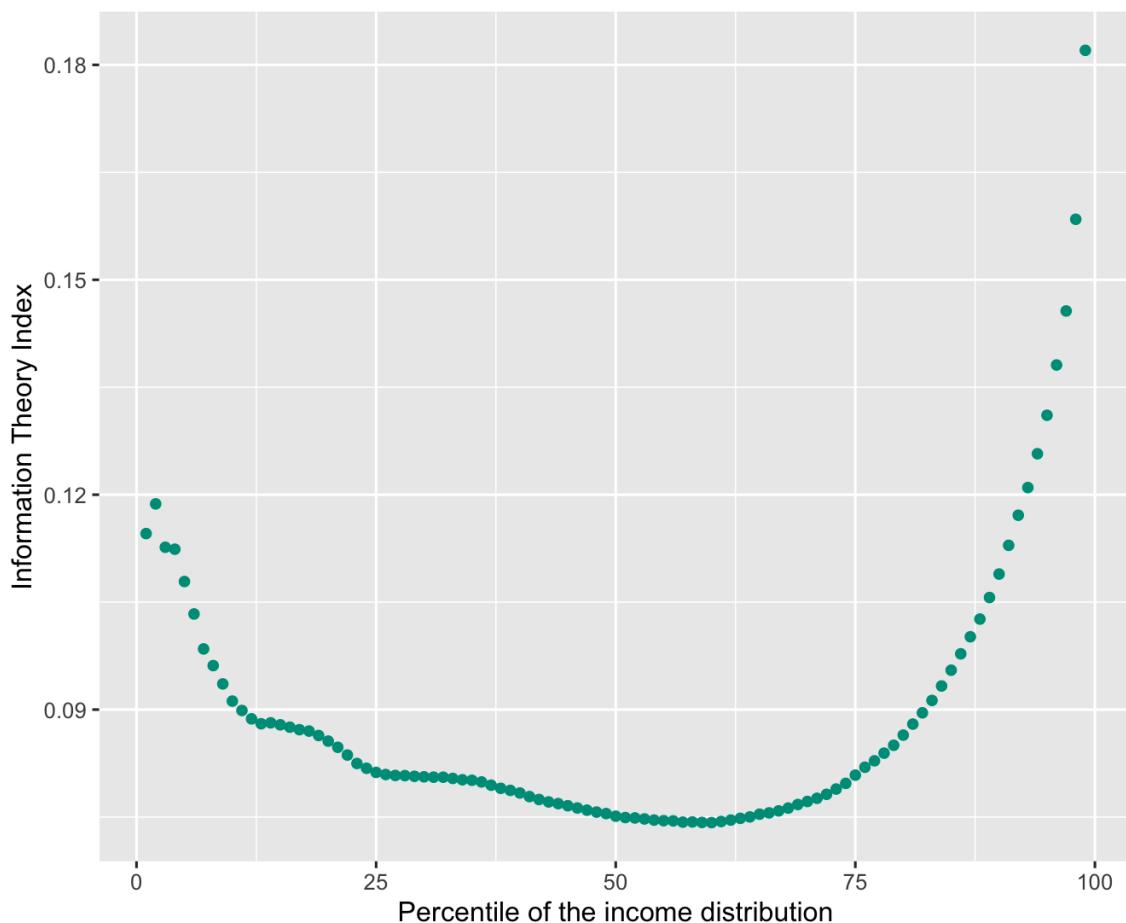
Methodology:

This article calculates the levels of economic inequality and income segregation in the entirety of the Netherlands from the year 2003 to 2021. Using microdata from Statistics Netherlands, it employs longitudinal, annual and geo-coded information at the 500-by-500-metre level for every household residing in the country during the period of study. Consequently, this research leverages administrative register data of an almost fully comprehensive nature with no sample bias, providing a more granular and detailed set of data that complement well studies that employ census information (Lobmayer & Wilkinson, 2002; Reardon & Bischoff, 2011; Rodríguez, 2016; Watson, 2009).

The basic unit of observation is set at the household level. Following Reardon & Bischoff (2011), they are assumed to constitute the primary unit of consumption and provide a more real sense of the disposable income of the people that constitute them. All households of the Netherlands are included into the sample and income is taken as adjusted for taxes and household size according to the procedures of Statistics Netherlands. Households are then identified to be part of both a municipality and a metropolitan area on the basis of their residential location. Both two geographical scales are taken into account because, while municipalities form the essential political institution for regulating local affairs, metropolitan areas provide a better match with actual urban social dynamics (Galland et al. 2020). For the case of metropolitan areas, the OECD Functional Urban Areas (FUA) classification is employed (Dijkstra, Poelman, & Veneri, 2019), with boundaries fixed for the year 2015. Estimations appear to be roughly similar using municipal and metropolitan units, so graphic visualizations are mostly centred on metropolitan areas, unless stated otherwise, for the sake of simplicity.

Firstly, income inequality is studied both at the municipality and the metropolitan level, employing the Gini coefficient (Gini, 1936) and the DescTools package for R (Andri et al., 2023). An examination of the temporal evolution of inequality as well of the income distribution (the share of income that every percentile group receives) in every FUA is also performed. Secondly, residential segregation is studied using the Rank-Ordered Information Theory Index (ROITI), following Reardon (2009) and Reardon & Bischoff (2011). The values are obtained for every municipality and FUA of the country between 2003 and 2021. In contrast with other measurements initially created for measuring racial-ethnic segregation such as the Dissimilarity Index (Massey & Denton, 1988), the ROITI is adapted to the specificities of the income data. As it measures segregation comparing successive pairwise income segments ordered by their ranking, it is adapted to a continuous variable such as income, does not rely on arbitrary thresholds and takes advantage of all income information. Moreover, it provides a measurement of segregation that is independent of actual income inequality. The code used for these calculations is partly derived from the OasisR package (Tivadar, 2019).

Figure 1. Information Theory Index of every pair of income segments of Amsterdam in 2021



Source: author's elaboration from CBS data.

Estimations of residential segregation are also performed at the income percentile level to identify the so-called segregation of affluence and segregation of poverty (Reardon & Bischoff, 2011). In such a way, the ROITI is decomposed in 99 Information Theory Indexes (ITI) that indicate the segregation experienced by the two income segments separated by a percentile. Figure 1 shows an example of this exercise for the case of Amsterdam in 2021. While the leftmost dot indicates the segregation level of Amsterdam when considering the poorest 1% versus the richest 99% households, the rightmost dot shows the value of the Information Theory Index when comparing the 99% poorest unis against the richest 1%. As described by Reardon (2009), the ROITI of every urban area is calculated through a weighted average of all ITIs calculated for each municipality and each FUA, respectively.

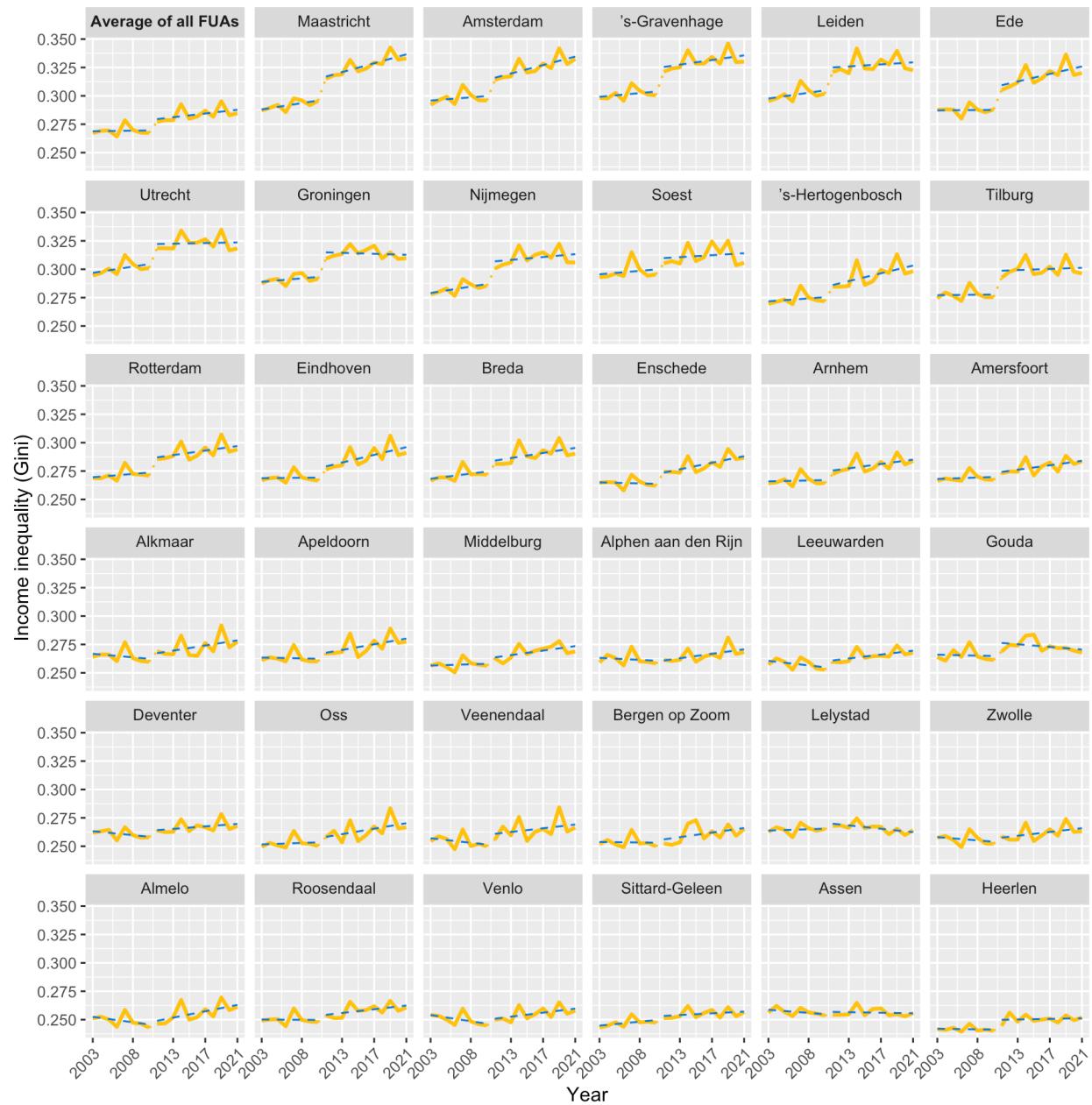
The same calculations regarding inequality and segregation measurements are replicated with income data before and after taxes and social transfers. In this case, no adjustment for household composition was performed for assuring compatibility between the two datasets, as adjusted data is not available before state redistribution. The difference in values obtained with these two sets of income data is computed every year in regards to inequality (Gini coefficients and the income share of every percentile group) and segregation (ROITI and the Information Theory Index disaggregated for every percentile pair), for every FUA and, when applicable, every municipality.

Data from Statistics Netherlands is processed to enable the analyses. Missing values (less than 3% of the sample) are eliminated, while negative incomes are transformed into 0. Data prior to 2011 was recorded with some modifications (e.g. extreme incomes were truncated to 1 million euros and untaxable salaries received from international organizations were not included), so the difference in the data collection method is annotated before and after 2011. No calculations of the income distribution and segregation by percentile groups are included for the case of municipalities. This is due to the Statistics Netherlands disclosure policy: no aggregated value can be released if its sample is fewer than 10 observations, which is the case of certain income percentile groups of a few municipalities. All code scripts are available in the appendix.

Results:

Data showed considerable changes in the evolution of inequality and segregation from 2003 to 2021. For the case of inequality, a moderate but considerable increase, especially after 2011, was recorded. As shown in Figure 2, the average Gini coefficient of Dutch metropolitan areas raised from 0.267 to 0.285. When considering municipalities, it increased from 0.264 to 0.277. All FUAs but one (Assen) saw their inequality increased, while 252 out of the 306 existing municipalities registered higher Gini coefficients in 2023 than in 2003. Similar results were obtained when limiting the analysis to the last 10 years with homogenous data collection.

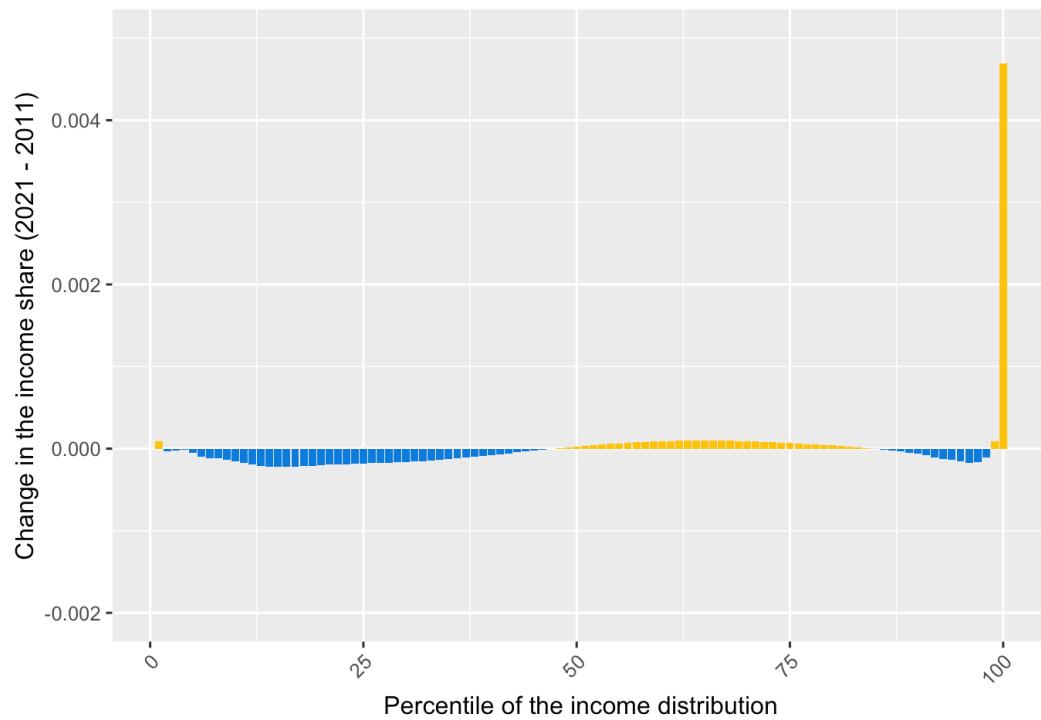
Figure 2. Evolution of economic inequality in all FUAs in the period 2003-2021



Source: author's elaboration from CBS microdata.

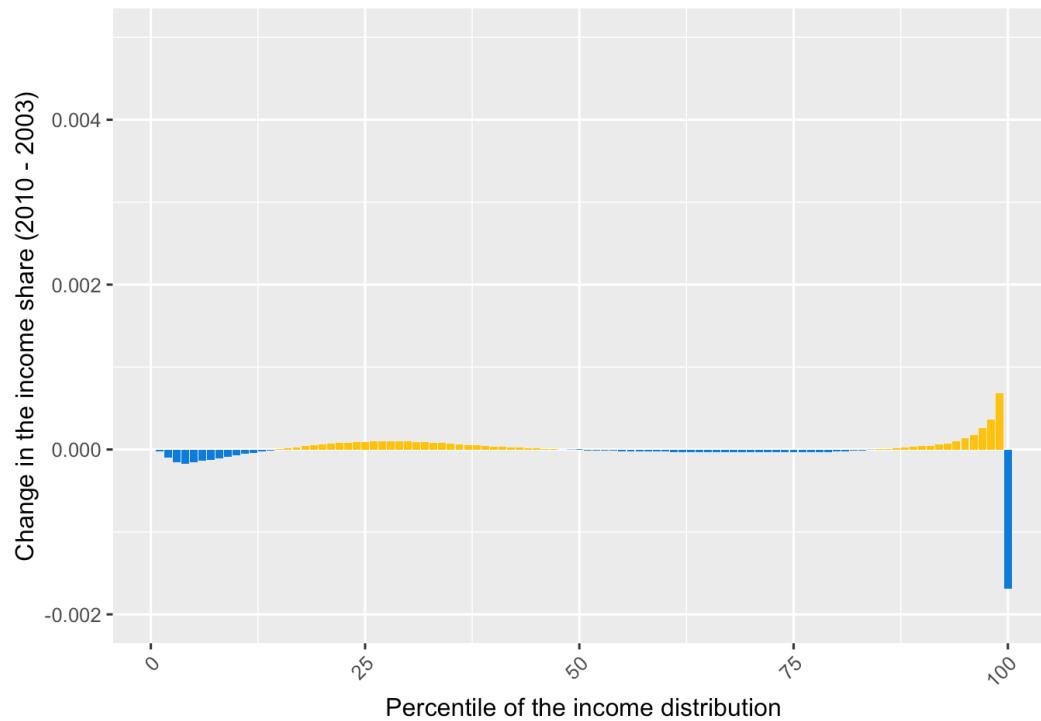
In the last ten years with available data, such an increase in economic inequality was mainly driven by an upward surge of the income received by the 1% top earners. Figure 3 illustrates how the share of income received by each income percentile group remained nearly steady for almost all segments of the population from 2011 to 2021, with one exception: the very most affluent households. This average pattern was observed in a majority of FUAs, although a group of them (Assen, Gouda, Heerlen, Leeuwarden, Roosendaal, Sittard-Geleen and Soest) registered stable income distributions (see Figure X in the appendix for a graphic visualization).

Figure 3. Average change in the income share of percentile groups (2011-2021)



Source: author's elaboration from CBS microdata.

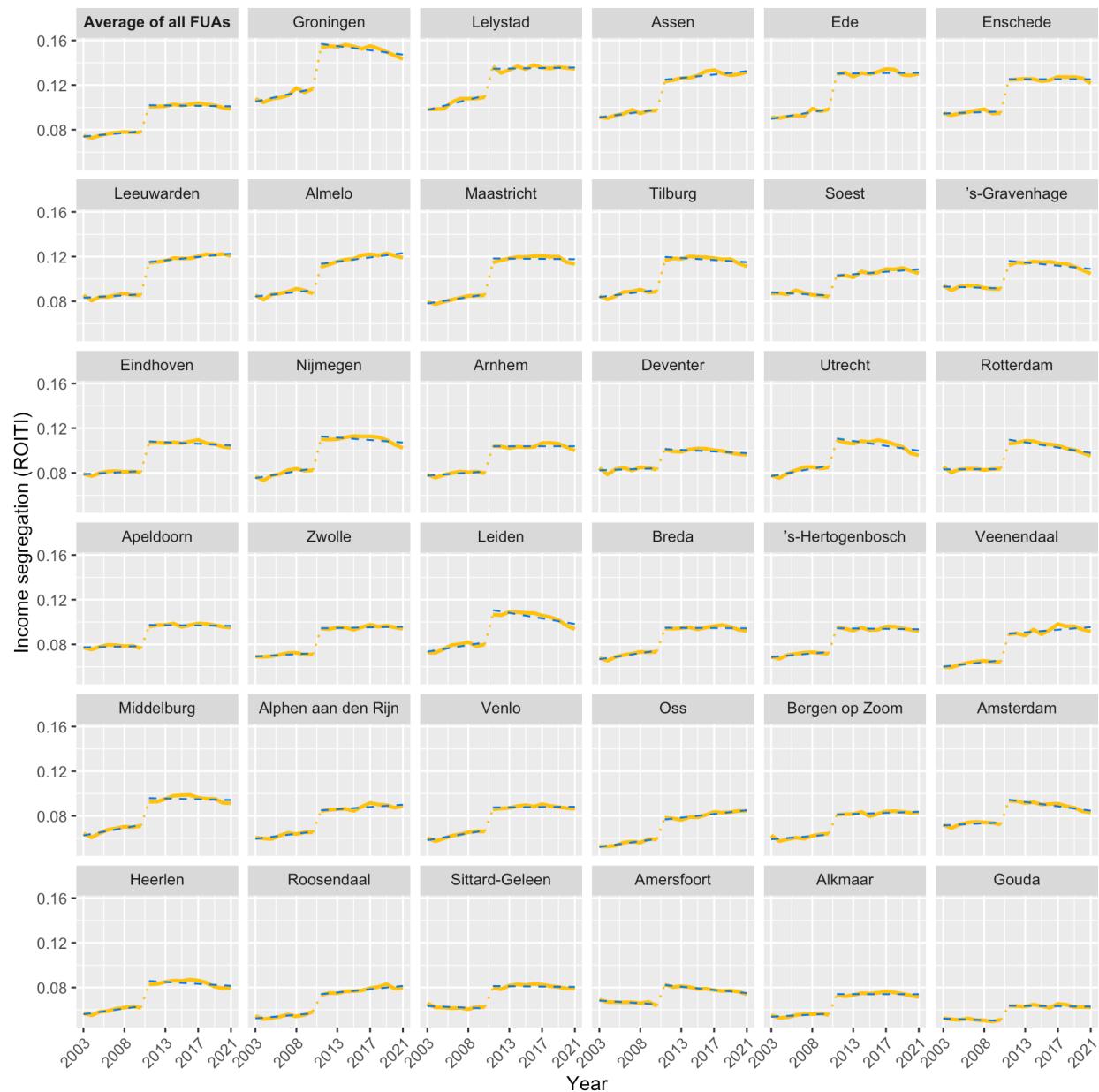
Figure 4. Average change in the income share of percentile groups (2003-2010)



Source: author's elaboration from CBS microdata.

Changes in inequality between 2003 and 2010 did not follow the same pattern, however. As shown in Figure 4, upper income segments experienced sizeable increases in their income share in those years, but the specific top 1% recorded a considerable decrease. This tendency was consistent across FUAs, although the intensity of the change varied (see Figure X in the appendix for a visualization of the different metropolitan areas).

Figure 5. Evolution of urban economic segregation in all FUAs in the period 2003-2021

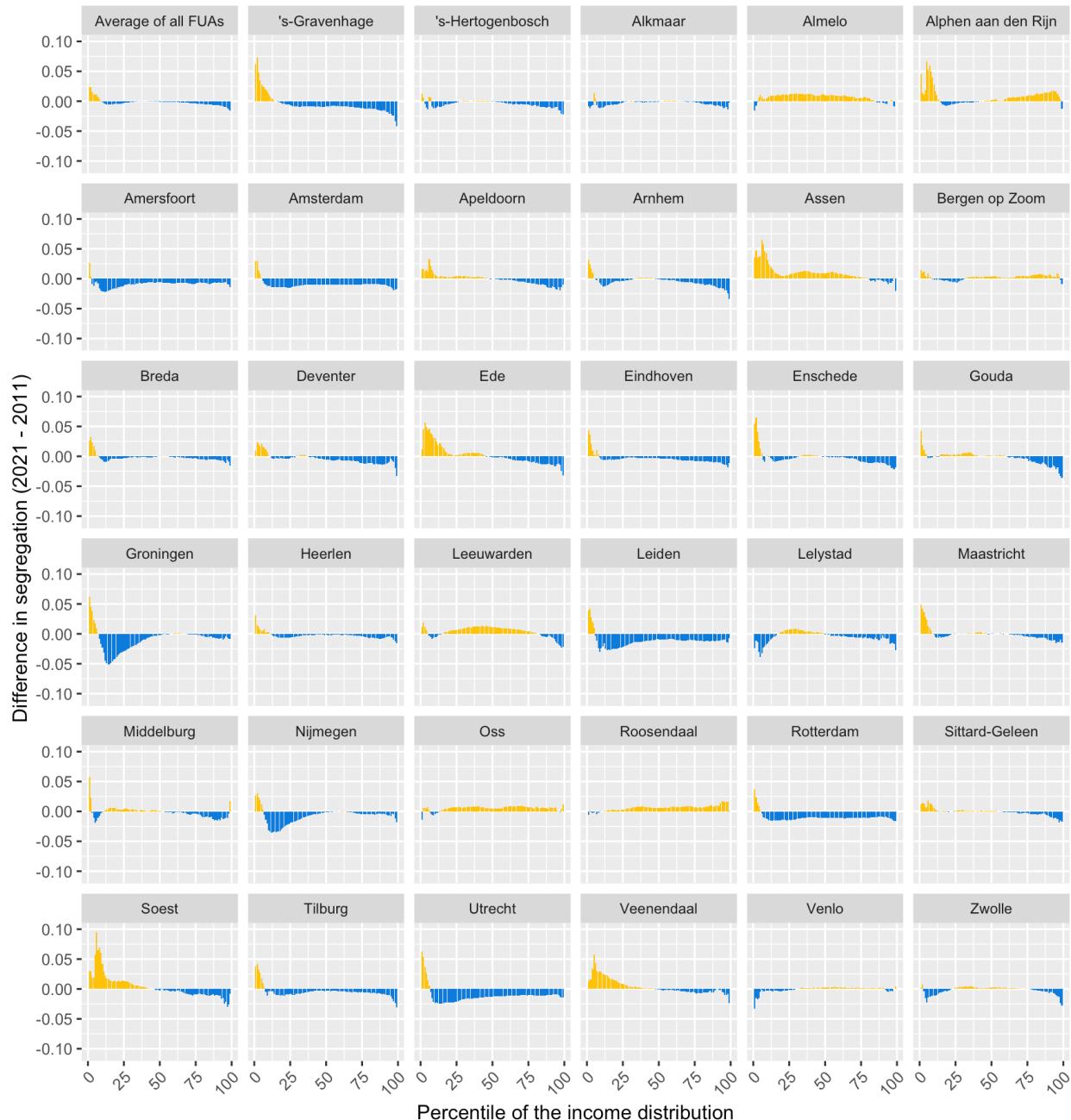


Source: author's elaboration from CBS microdata.

Levels of urban economic segregation reflected a more stable evolution. As observed in Figure 5, most of the apparent increase was seemingly due to the change in data collection methods

from 2011, with relatively constant values before and after. From 2011 to 2021, the average value of urban economic segregation measured by the ROITI slightly decreased from 0.101 to 0.096. A similarly negative and small change (-0.002) was obtained for municipalities. However, the first period of analysis (2003-2010) registered the opposite trend: while the average ROITI was of 0.075 in 2003, it grew to 0.078 in 2010 (0.063 and 0.065, respectively, for municipalities). Patterns differed among FUAs (see Figure 5), although changes were small in all cases.

Figure 6. Change in segregation for every percentile threshold from 2011 to 2021



Source: author's elaboration from CBS microdata

This relative stability conceals substantial changes in the segregation of different income groups. Figure 6 and 7 display noticeable differences in ITI when calculated for every possible percentile threshold of the income distribution. Remarkably, metropolitan areas do not show universal patterns in the evolution of their segregation profiles. For instance, middle- and upper-income segments became less segregated while the very poor became more clustered in most FUAs from 2011 to 2021, but several areas (e.g. Lelystad) do not necessarily show such a trend.

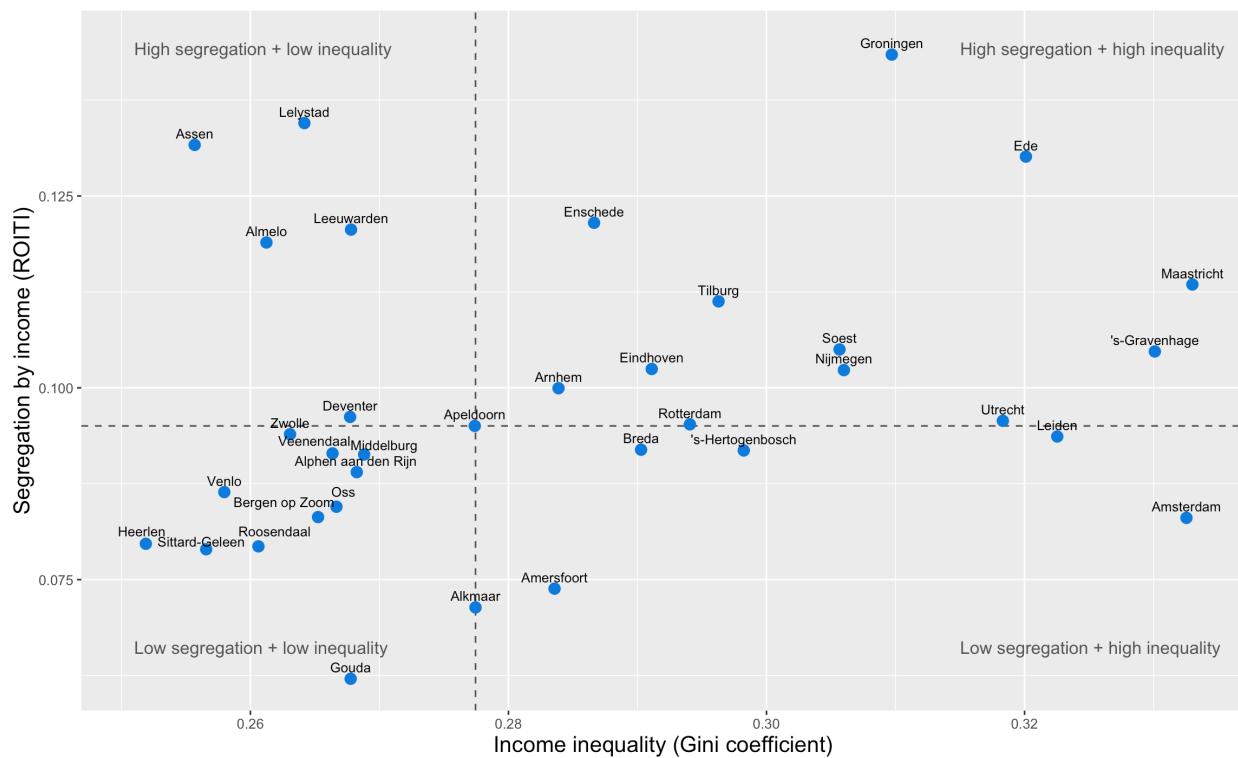
Figure 7. Change in segregation for every percentile threshold from 2003 to 2010



Source: author's elaboration from CBS microdata

These varying scenarios become more intricate when considering the 2003-2010 period. Changes in the segregation profiles were the opposite than in 2011-2021: households with very low incomes became less segregated, while all other groups became slightly more spatially clustered. In addition, differences between 2003 and 2010 were very heterogeneous. For example, all income groups registered higher ITI values in 2010 than in 2003 in metropolitan areas such as Leiden or Middelburg, whereas FUAs such as Amersfoort, Rotterdam or Sittard-Geleen saw general reductions of segregation. More generally, however, within-percentiles changes in segregation appear to be smaller in the 2003-2010 period than in the 2011-2021 one. As a result, segregation has overall increased for the very poor and decreased for the rest.

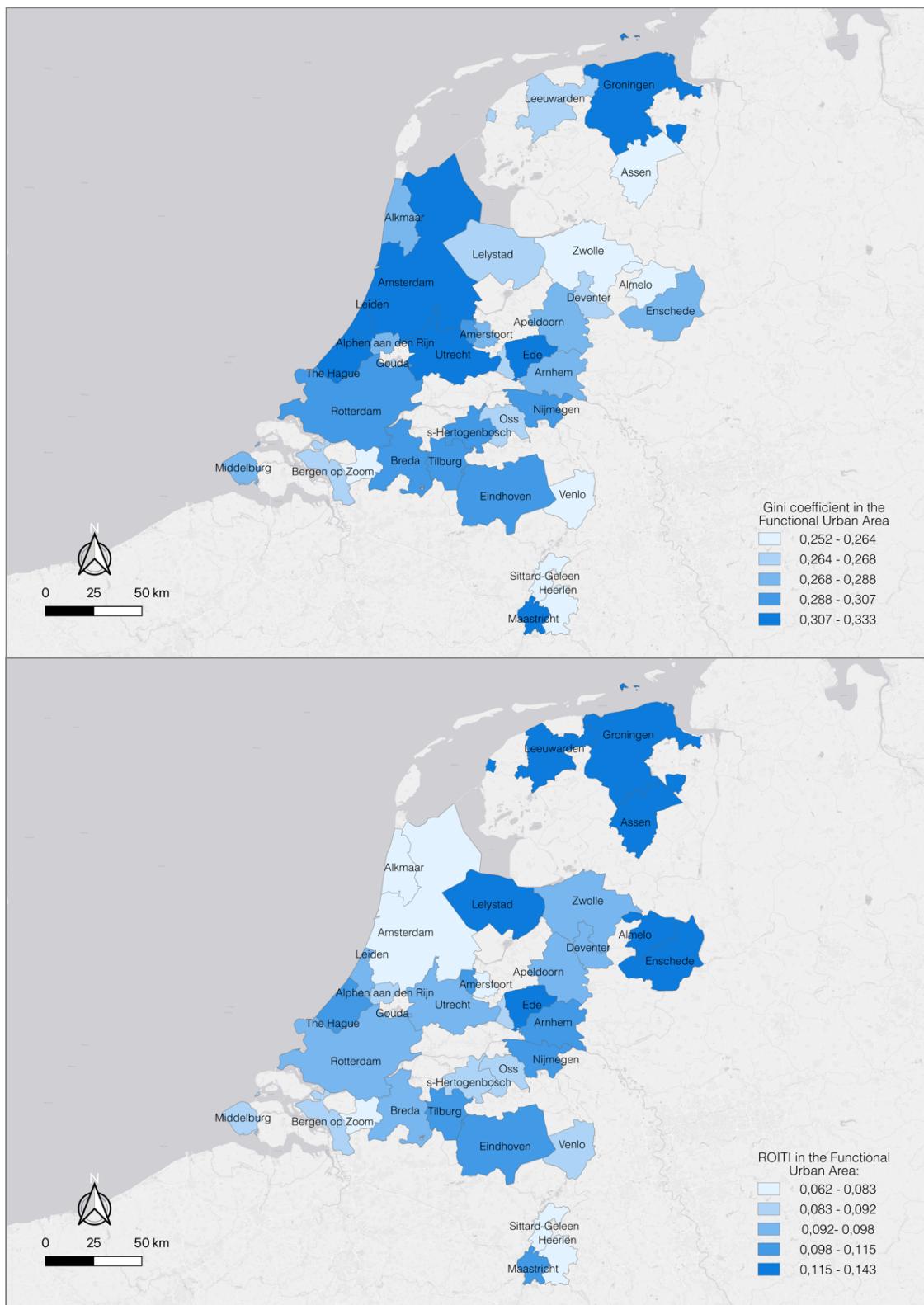
Figure 8. FUAs according to their inequality and segregation values in 2021



Source: author's elaboration from CBS microdata

Figure 8 displays the overall Gini and ROITI values of all metropolitan areas in the last year of study (2021). It indicates considerable heterogeneity in the degree of segregation and inequality among FUAs. Four different groups are classified according to the possible combinations of inequality and segregation values. Most metropolitan areas record either high segregation coupled with high inequality or low segregation combined with low inequality, but there are several FUAs that experience diverging values of the two phenomena. Figure 9 shows the same information in a cartographic manner, showing how segregation weakly correlates with inequality on space.

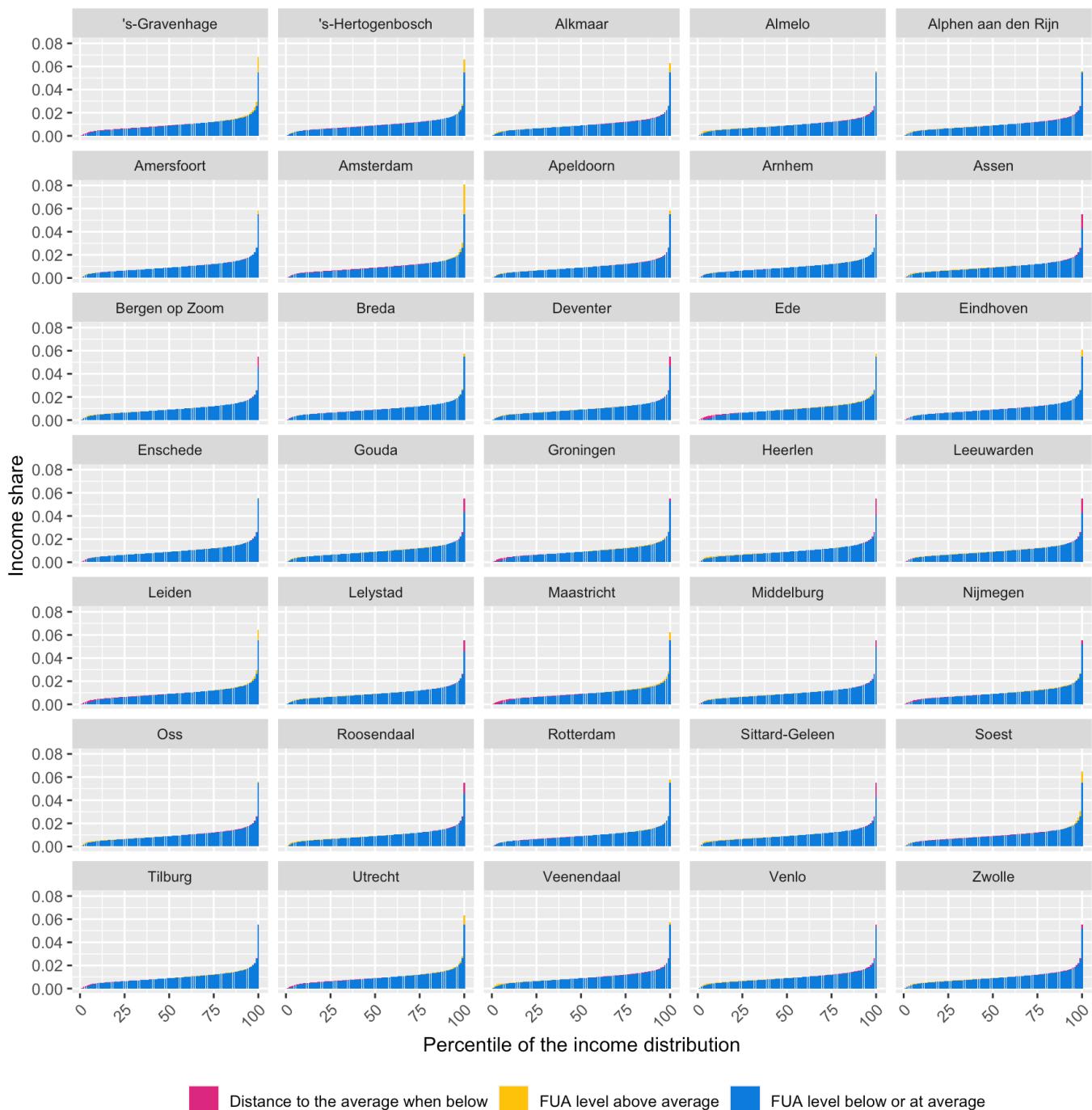
Figure 9. Maps of economic inequality and segregation of Dutch FUAs in 2021.



Source: author's elaboration from CBS microdata.

Disaggregating the measurements at the percentile level also reveals relevant variations among FUAs. On the side of the social distribution of income, all metropolitan areas show very similar profiles - except for the income shares of the richest households and, in certain cases, also the of the very poor. The results can be observed in Figure 10.

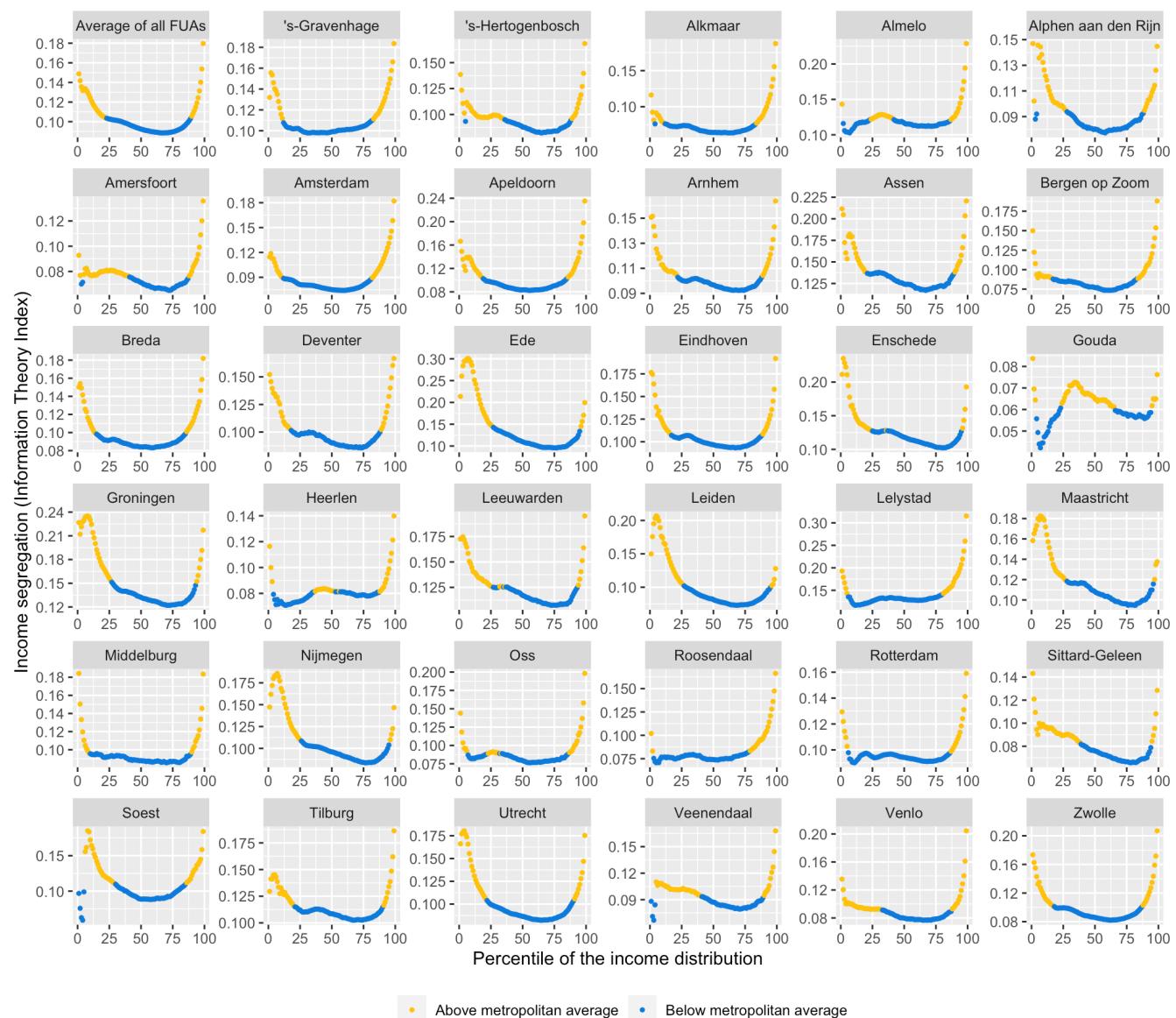
Figure 10. Income distribution of FUAs in 2021 compared to the country's average.



Source: author's elaboration from CBS microdata

Variations are even greater in the case of the segregation profiles of FUAs. Figure 11 shows the ITI calculated at every possible percentile threshold of all metropolitan areas in 2021. In most FUAs, it is the extremely affluent households which constitute the most spatially clustered group. However, in multiple urban areas (see, for example, Alphen aan den Rijn, Ede or Maastricht), very low-income households appear as the most segregated. Moreover, levels of segregation at the percentile level range considerably: from 0.042 (measured at the 7th percentile in Gouda) to 0.315 (calculated at the 99th percentile in Lelystad). Despite these differences, middle income households are almost universally the group that is more mixed within neighbourhoods with other segments of society.

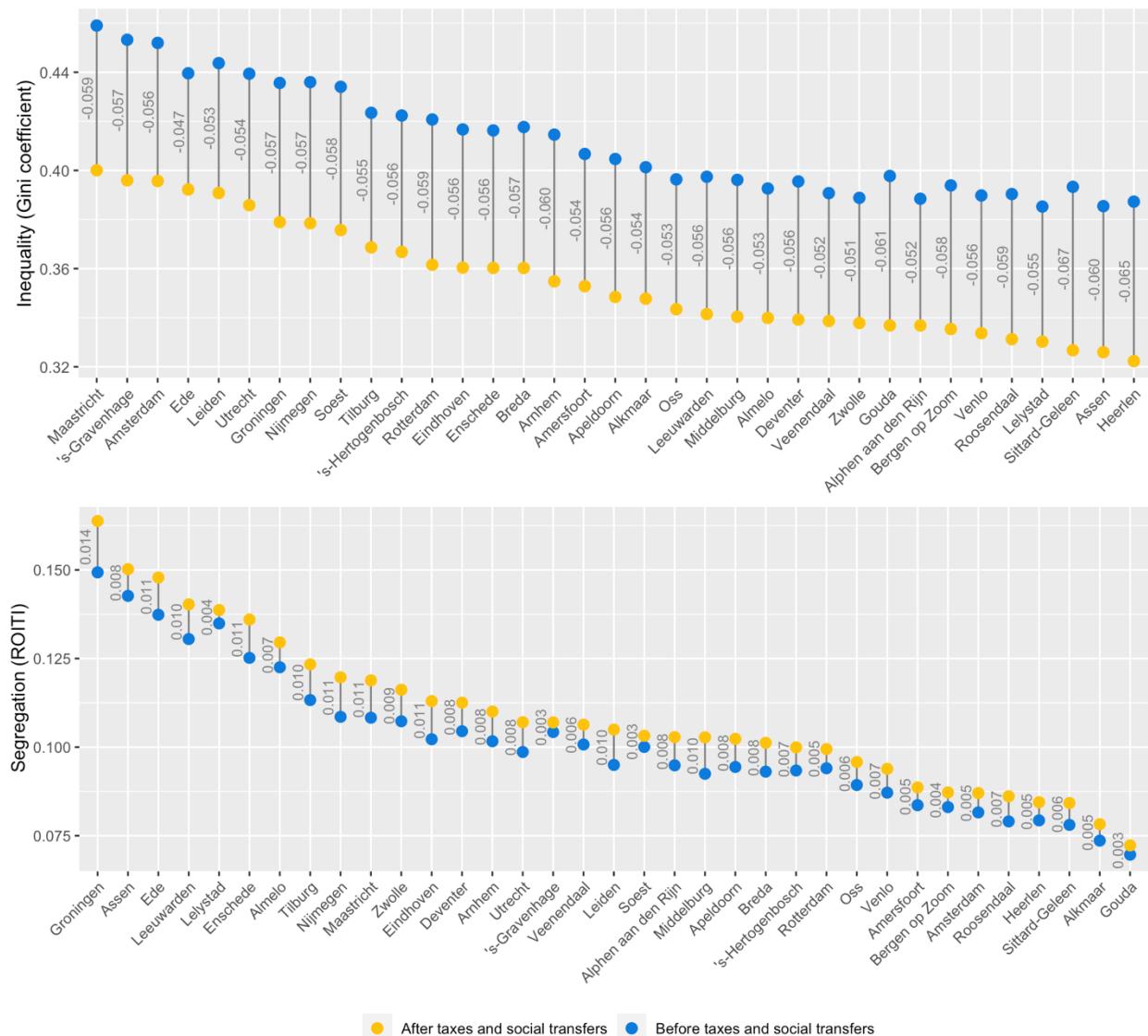
Figure 11. Segregation profiles of FUAs in 2021 by income thresholds



Source: author's elaboration from CBS microdata

Figure 12 shows general levels of economic inequality and segregation in every FUA in the year 2021 taking into account the effect of the state redistribution of income. The evidence they present is strikingly different: while taxes and social transfers reduce the Gini coefficient of all metropolitan areas, they conversely increase the ROITI value in all cases. This paradoxical effect emerges as larger on those FUAs with higher levels of segregation, where state redistribution tends to boost ROITI comparatively more. In contrast, taxes and social transfers generally reduce inequality in all metropolitan areas in a similar degree.

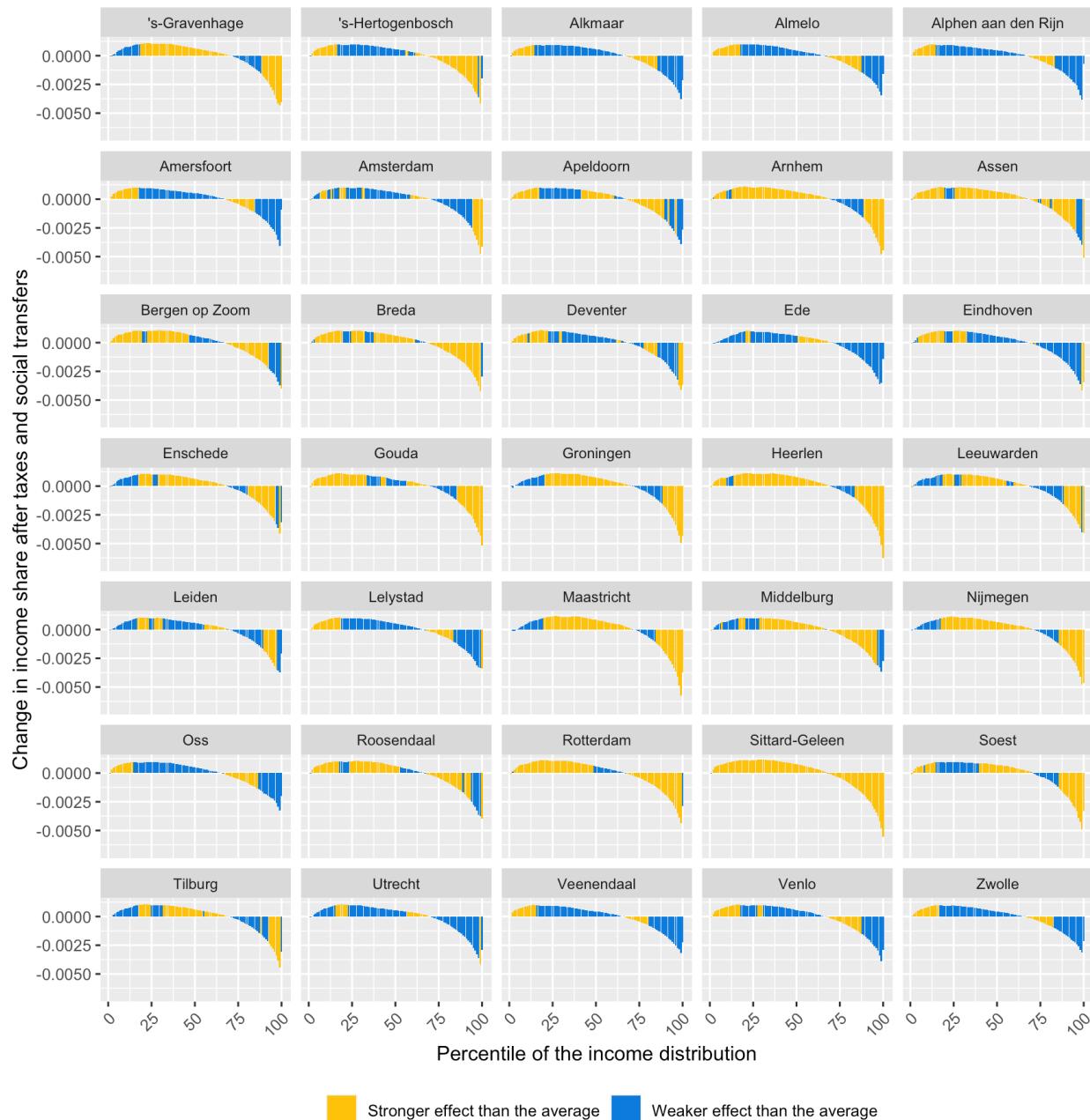
Figure 12. Inequality and segregation before and after taxes and social transfers in all FUAs in 2021



Source: author's elaboration from CBS microdata

State redistribution seems to also impact on the social distribution of income following analogous patterns in most FUAs. In general, taxes and benefits reduce the disposable income of the top third of the population; and increase it for the low- and middle-income households. However, the intensity of transfers for each percentile varies across FUAs. Results are shown in Figure 13, which compares the effect of the state redistribution on each percentile with the general average.

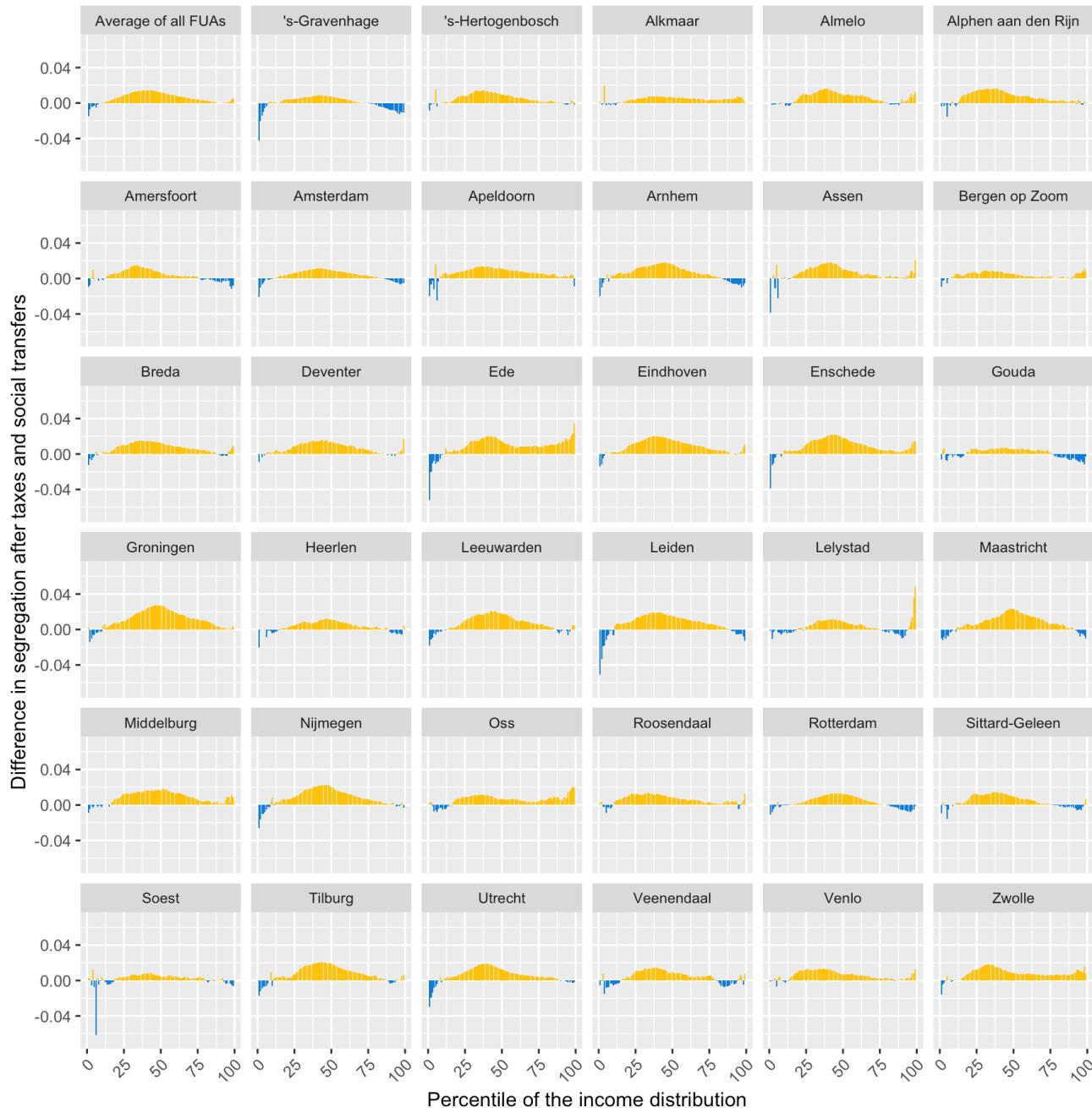
Figure 13. Change in percentiles' income shares after state redistribution in 2021



Source: author's elaboration from CBS microdata

The effect of taxes and transfers is somewhat more heterogeneous regarding segregation. On average, fiscal policies and government social aid mechanistically increase the segregation of middle- and, to a lesser extent, top income households. Simultaneously, state redistribution lessens the spatial clustering of the poorest segments. Nonetheless, patterns differ moderately among metropolitan areas: the strength of the effect, and sometimes even the direction, is variable. Results are displayed in Figure 14.

Figure 14. Segregation change after state intervention at every percentile threshold (2021)



Source: author's elaboration from CBS microdata