Social Housing Allocation and Economic Segregation in the Netherlands 2007-2023.

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1. Extended Abstract

The Netherlands have long been recognized as an international reference for the effectiveness of its social rental housing system which provides solutions for low-income households. With more than a third of its housing stock dedicated to social housing, the Netherlands belong to the countries with low income segregation and high sociospatial mobility in Europe [8]. Housing corporations (now Housing Associations) have played a central role in this system, significantly expanding the stock of social housing. However, structural reforms since the late 1980s have transformed their operational framework, leading to a shift in decision-making power from national authorities to local municipalities. Additionally, the mission given by the Government to housing associations has shifted from a broad housing mandate towards the provision of housing to the most vulnerable segments of households. The introduction of the so-called 90% rule in 2010 is a case example of this shift [2, 3, 7].

In this research, we evaluate how these changes, particularly the **90% rule**, affected **local economic segregation** between 2007 and 2023. This particular regulation resulted from an agreement between the Dutch government and the European Commission, requiring that at least 90% of newly available social housing units be allocated to households below the *DAEB income limit*[1]. The rational for this policy was to reduce a competition deemed unfair between subsided housing corporations and regular landlords by restricting social housing providers to the segment of low-income renters [5, 2].

It has been shown that the residualization of social housing in general had perverse effects on social renter stigmatisation and the concentration of poverty [14]. As the spatial concentration of low-income households in neighborhoods can lead to detrimental effects, we consider this potential policy side effect worth examining. Local segregation may reduce employment accessibility due to labor market mismatches, limit intergenerational mobility, and weaken productivity, ultimately affecting aggregate economic growth. Beyond economic consequences, segregation can also negatively impact health, education, and overall social cohesion, reinforcing existing inequalities. [11, 6, 4, 10, 1]

How did the 90% rule affect the concentration of low-income families at the local level? In other words, is there a causal relationship between changes in policy and changes in income segregation in the Netherlands? 15 years on, we can now measure the specific implications of this policy on the overall levels of income segregation, and on the spatial concentration of poverty in particular. In this paper, we assess whether this shift in housing allocation policies contributed significantly to observation changes in segregation patterns at a microlevel.

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[1]According to the Ministry of Foreign Affairs, DAEB (Diensten van Algemeen Economisch Belang) refers to Services of General Economic Interest, a category under EU law that allows governments to grant public service obligations to specific sectors. In the Dutch housing market, *DAEB housing* includes social housing rented at regulated prices, primarily allocated to low- and middle-income households. To determine eligibility, an annual upper income limit is set for these groups, ensuring that social housing remains accessible to those with the greatest financial need.

Housing Market and the 90% Rule

During the postwar period, the Dutch social housing system expanded significantly, reaching its peak in the 1990s, when social housing comprised approximately 41% of the total rental market. The central government played a major role in financing and supporting housing associations, ensuring affordability for low-income groups. However, in the late 1980s and early 1990s, reforms sought to liberalize the housing market, granting housing associations greater financial independence and promoting competition with private developers [9]. Despite these changes, housing associations continued to benefit from state guarantees, direct subsidies, and discounted land purchases, which the European Commission later identified as market distortions. Following complaints from institutional investors after the Global Financial Crisis, the European Commission questioned state aid to housing associations, arguing that it violated EU competition rules. In response, the Dutch government introduced new regulations, with the 90% rule being one of the most significant measures.

The 90% rule mandated that at least 90% of newly available rental dwellings (both new and recently vacated) be allocated to households below the *DAEB income limit*, ensuring that social housing remained targeted at low-income groups. This requirement significantly altered allocation mechanisms, shifting decision-making authority to local municipalities. The rule was further reinforced by the 2015 Housing Act.

Understanding whether the **90% rule** influenced overall economic segregation levels (the spatial expression of income inequality) provides insight into the broader **effects of housing policies on spatial income distribution**. Since this rule was part of a broader housing policy transformation—culminating in the 2015 Housing Act—its impact on economic segregation must be evaluated within this wider policy context.

While some studies [12, 13] have explored the relationship between housing policies and segregation, their findings remain largely descriptive. There is a lack of empirical studies that provide statistical evidence on the causal impact of the **90% rule** on income segregation across Dutch cities. Our research aims to fill this gap by applying an empirical framework to measure the effect of these policies on local income segregation patterns.

Data Description

Our analysis is based on administrative (public but access-restricted) georeferenced data from Statistics Netherlands (CBS), covering over 7 million households in 2007 and 2023. This System of Social Statistical Datasets (SSD) enables us to track changes in household characteristics, orange housing tenure and income distribution at a granular level.

We aggregate individual data into 500x500m grid cells, starting with over 84 thousand grids nationwide. To ensure robust (and secure/anonymous) statistical analysis, we exclude cells with fewer than 10 observations, reducing our sample to approximately 31 thousand grids.

To compute the share of low-income households in the social housing sector, we restore tenure and average income (adjusted for family size) for 2007 and 2023. We also account for household composition, distinguishing between families with and without

children. Additionally, we incorporate municipality-level data, including information on policy implementation.

Empirical Strategy

Our empirical strategy evaluates whether changes in social housing allocation rules had micro-level effects (500m grid cells) and whether these, in turn, influenced local income segregation levels (1 km buffer) in the Netherlands between 2007 and 2023. Our hypothesis is that the potential impact on residualization of social housing at the micro level could directly change the income segregation at the local level and may also influence overall income segregation levels. To test this hypothesis, we need to operationalise three concepts:

- Measurement of policy impacts at micro leve.

- The measurement of economic segregation at the local level.

- The assessment of the causal relation between changes in policy and changes in economic segregation.

Concept 1: Micro-Level Impact of Policy Changes

To measure the effect of the **90% rule**, we track changes in the share of low-income families, L, defined as households below the DAEB income limit, in each grid i. We focus on grids with an initial concentration of low-income families in 2007, selecting those with a minimum share of 15%. We compute:

$$\Delta L_i = L_i^{2023} - L_i^{2007}$$

where L_i^t represents the share of low-income households at grid i in year t. Since broader trends and demographic shifts may also impact L_i, we apply a Shift-Share decomposition to separate:

- National Effect (NE): Broad macroeconomic and policy-driven trends.

- Compositional Effect (CE): Changes due to demographic shifts (e.g., household structure).

- Policy Effect (PE): The residual, attributed to the 90% rule.

We estimate the policy-related variation as follows.

$$PE_i = \Delta L_i - (NE_i + CE_i)$$

Concept 2: Measuring Economic Segregation

We use Moran's index to measure local economic segregation. Specifically examining spatial clustering of income levels within a 1-km buffer around each 500m grid. The Moran's I index is a measure of spatial autocorrelation, capturing whether grids with similar average income levels are clustered together. This will ultimately allow us to assess whether income sorting patterns have intensified due to the policy changes. The traditional form takes the following form:

$$I = \frac{1}{S^2} \frac{\sum_i \sum_j W_{ij}(y_i - \bar{y})(y_j - \bar{y})}{\sum_i \sum_j W_{ij}}$$

where W_{ij} represents spatial weights based on distances between grids.

This step is crucial to distinguish localized segregation changes from broader economic trends. It also ensures we capture intra-urban segregation dynamics, independent of municipal or regional boundaries.

Concept 3: Establishing Causality

To determine whether the changes in social housing allocation policies allocation had a direct impact on local economic segregation, we employ a two-stage least squares (2SLS) approach whit the main variables are in the form of long variation. The primary goal of this step is to isolate the exogenous variation in income segregation caused by the policy changes while controlling for broader economic trends and demographic shifts. To mitigate endogeneity concerns, we use a two-stage least squares (2SLS) regression, where the first-stage instruments ΔL_i using the Shift-Share decomposition introduced in the previous step. The second stage regresses the local Moran I. on the predicted $\Delta \hat{L}_i$. Additionally, considers urban form, with the inclusion of population density as well as spatial administrative limits such as FUAs and Municipalities. It takes the form :

$$\Delta I_i = \delta_0 + \delta_1 \Delta L_i + \delta_2(\text{pop. density 2007}) + \delta_3(\text{municipality}_j) + \delta_4 \text{FUA}_z + \omega_i$$

Conclusion and Policy Implications

Our study aims to provide evidence on how policy-driven allocation changes influence spatial income segregation. The findings will inform whether stricter allocation rules improve or exacerbate segregation and offer recommendations to optimize housing policies to balance targeted allocation with income integration.

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