

Reurbanization and Spatially Polarized Land Markets – An Analysis of Urban Land-Value Changes in North Rhine-Westphalia, Germany, 2012–2024

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Received: 12 September 2024 ■ Accepted: 23 January 2025 ■ Published online: 11 February 2025

Abstract

In recent years, land prices in Germany have skyrocketed to levels that were hardly thought possible. This has particularly affected prospering cities, where price increases of more than 100 % have often been recorded since the turn of the millennium. The underlying causes are highly controversial. While some scholars point to the scarcity of developable land due to regulatory restrictions, others see the “financialization” of housing markets in the wake of the financial crisis and the massive influx of liquid capital into land and housing markets as the decisive driver. Against this background, this paper investigates the spatial patterns of land price dynamics in North Rhine-Westphalia during a phase of strong demographic and economic reurbanization. We used disaggregated data from the BORIS system for the years 2012 to 2024, which is available state-wide and georeferenced. Our empirical findings point to a significant trend of market polarization, with excessive growth rates in prospering metropolitan areas and real value losses in some rural areas. Overall, the paper offers new in-

sights into the spatial patterns of urban land markets and possible driving factors explaining uneven developments.

Keywords: Land prices ■ Land market ■ Housing costs ■ Land use ■ Reurbanization ■ North Rhine-Westphalia ■ Germany

Reurbanisierung und räumlich polarisierte Bodenmärkte – Eine Analyse von Bodenpreisveränderungen in Nordrhein-Westfalen, Deutschland, 2012–2024

Zusammenfassung

In den vergangenen Jahren sind die Bodenpreise in Deutschland in einer zuvor kaum vorstellbaren Weise gestiegen. Besonders betroffen sind prosperierende Großstädte, in denen sich die Preise seit der Jahrtausendwende häufig verdoppelt haben. Über die Hintergründe dieses Phänomens ist eine kontroverse Diskussion entstanden. Während einige Expertinnen und Experten auf die Knappheit an Bauland aufgrund von planerischen Restriktionen verweisen, halten andere Stimmen die „Finanzialisierung“ der Wohnungsmärkte infolge der Finanzkrise und des Zustroms von anlagesuchendem Kapital für maßgeblich. Vor diesem Hintergrund untersucht dieser Beitrag die räumlichen Muster von Bodenpreisdynamiken in Nordrhein-Westfalen in der Phase einer starken demographischen und ökonomischen Reurbanisierung. Wir nutzen disaggregierte Daten des BORIS-Systems für die Jahre 2012 bis 2024, welche für das gesamte Land georeferenziert vorliegen. Unsere Ergebnisse zeigen einen signifikanten Trend einer Marktpolarisierung mit extrem starken Wachstumsraten in ökonomisch prosperierenden Stadtregionen und realen Wertverlusten in einigen ländlichen Gebieten. Unser Beitrag bietet einen neuen Einblick in die räumlichen Muster von Bodenmarktentwicklungen und

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mögliche Faktoren, die ungleiche Entwicklungen erklären können.

Schlüsselwörter: Bodenpreise ■ Bodenmarkt ■ Wohnkosten ■ Bodennutzung ■ Reurbanisierung ■ Nordrhein-Westfalen ■ Deutschland

1 Introduction

For many years, land prices in Germany have seemed to know only one direction: upwards. The price index for built and developable land published by the Federal Statistical Office shows a continuous increase. Between 2009 and 2019, prices rose by 87% nationwide (Statistisches Bundesamt/WZB/BiB 2021: 266) and the upward trend continued in the following years.¹ It is worth noting that land prices have risen much faster than the costs of purchasing houses and condominiums (Spars 2017), as well as the general cost of living. Major cities are particularly affected by this development. Here, land prices have often doubled in recent years, and in attractive inner-city locations, increases of three to seven times over a period of 15 years are not uncommon.

Land prices indicate economic expectations regarding the profitable utilization of land. High and rising price levels are, in a certain sense, a socio-economic seismograph, evidence of local and regional prosperity and faith in the long-term prospects of a location. In a number of ways, however, high land prices are also a critical factor in urban development and urban policy. First, the cost of land is a significant variable in the economics of residential construction. Although the causality between land and housing price dynamics is complex (Wieser 2008), a positive association between land prices and housing costs is generally undisputed. In Germany, it can be shown that the share of land costs in the total production costs of new housing units has been rising for many years (Aring/Coulmas/Rohland et al. 2017), which makes it more difficult to create affordable homes. Not surprisingly, public housing cost rents have risen continuously and privately financed housing construction is being realized primarily in the high-price and luxury segment. Second, high land costs also make it difficult for municipalities to acquire land for urban development initiatives, such as social housing, public services, leisure and recreation or climate change adaptation (Adrian/Bunzel/Michalski et al. 2021). In this way, the land cost is-

sue becomes a question of public infrastructure affordability and viability. Without an active land policy, the ability of local authorities to influence land market developments and implement strategic projects may decline. Finally, increasing housing costs, which are at least partly driven by land prices, also affect residential location choice (Münter/Tippel/Albrecht 2022). In recent years, suburbanization in German city regions has become more dynamic (Volgmann/Growe/Münter et al. 2022). Escalating house prices in most core cities have led to a spatial shift of housing demand into the suburban peripheries, especially for house-buying households. 20 years ago, Aring (2005: 33) described this with the metaphor of “sliding down the land price mountain”. High land prices thus also affect metropolitan land-use change patterns and their manifold environmental, social and economic externalities.

Despite the undisputed relevance for urban development, there have been hardly any empirical studies on the development of land prices in Germany to date. In particular, systematic analyses of spatial patterns of land price changes are rare (see for example NRW.BANK 2019; Meinel/Reiter/Walz et al. 2020; BBSR 2021; Gerten/Münter/Siedentop et al. 2021). One reason for this may be that official data on standardized land values (*Bodenrichtwerte*) so far had to be compiled at comparatively high cost by contacting regional and local expert committees for land values (*Gutachterausschüsse für Grundstückswerte*; see Section 3 for details concerning the survey of land values in Germany). For larger study areas, the effort required for research can therefore quickly exceed feasible limits (Meinel/Reiter/Walz et al. 2020). At the same time, available data has usually been aggregated to administrative territorial units such as counties, municipalities or city districts. This has now changed with the increasing digital availability of disaggregated and annually updated land-value data in the BORIS system.² BORIS is the main information system of local expert committees for land values in Germany. Current and past standardized land values are available for the whole of federal states. They reflect the price level of developed or developable plots as well as agricultural and forestry land. BORIS offers georeferenced data at the level of small-scale land market zones.³

In this paper, we analyse the change of land values for the

¹ <https://www.genesis.destatis.de/genesis/online?sequenz=tabelleErgebnis&selectionname=61262-0001#abreadcrumb> (09.01.2025).

² It should be noted here that land prices and land values are not identical. Land values are average values calculated by local/regional expert committees from the prices of current land sales (see Section 3 for details). In this paper, we use the term “land values” when referring to official data from BORIS and “land prices” when discussing price developments of land markets in general.

³ <https://www.boris.nrw.de/boris-nrw/?lang=de> (09.01.2025).

federal state of North Rhine-Westphalia (NRW) over a period of 13 years (2012–2024). We investigate the temporal dynamics and spatial patterns of land price increases and discuss possible drivers of spatially uneven developments. Since disaggregated longitudinal data on demographics, the housing market and developable land is not available, we cannot pursue a regression-analytical approach. Our investigation therefore remains descriptive, combined with a literature-based discussion of potential driving forces and causal relationships. We assume that rising land prices are predominantly a problem for larger and economically prosperous cities. We further hypothesize that increasing land costs can only be interpreted as a signal of market tension to a certain extent, in particular in relation to a scarcity of developable land for accommodating housing needs. The “financialization” of land and housing markets, which began in the 2000s, and the resulting influx of liquid capital into the real estate sector are no less important. We argue that land prices are first and foremost an expression of market players’ long-term profit expectations, which are influenced but not determined by the relative scarcity of developable land.

In the following, the state of research on the factors influencing land price dynamics is briefly outlined (Section 2) before the data and methods used are explained in Section 3. Section 4 presents the empirical findings for North Rhine-Westphalia. Section 5 continues with an in-depth discussion of the empirical results before we draw some conclusions and discuss research needs in Section 6.

2 Overview of the literature

The basic Alonso-Mills-Muth model of urban land explains why land prices exhibit pronounced core-periphery gradients (Mieszkowski/Mills 1993; Ahlfeldt 2011). In a monocentric urban system, it is expected that population density and land prices will decrease with increasing distance from the city centre. In abstraction from further influences, the price of residential land is considered as a function of accessibility and commuting costs. Land prices arise from the competition between different uses, each with its own specific land rent function. Rent functions indicate the willingness of households and firms to pay for locations with different levels of centrality and accessibility. Under free market conditions, property owners capitalize the accessibility advantages of central locations as land rent. Alonso (1964), Mills (1967) and Muth (1969) developed their basic model of urban land economics for monocentric systems where employment is assumed to be concentrated in the city centre. However, the transition from monocentric to polycentric urban systems has not fundamentally questioned the

key relevance of city centre accessibility for land prices (Paulsen 2012; Schmidt/Krehl/Fina et al. 2021).

Explaining the change of land prices over time, on the other hand, is much more challenging. The only undisputed fact is that rising land costs always reflect supply-demand relations (DiPasquale/Wheaton 1992). However, the way in which supply and demand for built and developable land interact in determining prices is controversial. Neoclassical theory regards residential land as an important production factor for the construction of housing. Higher asset prices are the result of higher rents or implied rents (in case of owner-occupied housing). If it is not possible to respond to the increasing demand for housing (e.g. due to an influx of population) by expanding the supply of developable land, land prices will rise. In this context, neoclassical economists are critical of spatial planning restrictions on the developability of land (Fischel 1990), as they could contribute to inelastic land and housing markets, which in turn can have a negative impact on the development capacity of urban regions (Glaeser/Gyourko 2018). Examples include limits on urban density (like low-density zoning or building height restrictions) or the protection of greenbelts and recreational areas in the surroundings of cities (Dawkins/Nelson 2002). In such cases, neither densification in built-up areas nor new construction on greenfield sites can lead to a relaxation of the market.

On the other hand, some scholars argue that house prices can affect land prices (Wieser 2008). According to this view, demand-side shocks, such as a sharp increase in population, lead to changes in property owners’ expectations regarding future rental income. This is articulated in rising house prices, followed by land prices after a time lag. According to this view, the expansion of developable land would have less of an impact on prices than impulses from the demand side. In comparison to the fundamental assumptions of neo-classical economics, causality is reversed in this view: it is not primarily the scarcity of developable land that drives up prices but the long-term capitalization expectations of landowners.

The extensive literature on this topic provides evidence for both positions. Some studies conclude that urban growth management can have unintended land price effects, as more restrictive regulations result in decreased land supply and higher house prices (Fischel 1990; Bae 1998; Dawkins/Nelson 2002; Korthals Altes 2006; Eichhorn/Pehlke 2022). One reason could be that developers do not automatically respond to rising land prices by increasing residential density (Dawkins/Nelson 2003) or are prevented from doing so by zoning regulations and other regulatory constraints. Limiting development can thus result in decreased housing supply and increased housing values, particularly if development is constrained through low density, single-use zoning.

With the prioritization of inward development over the provision of new developable land on greenfield sites, as required by the German Federal Building Code (*Baugesetzbuch*), development obstacles to the production of building land in Germany could have a particular impact on land price trends. In recent years, large cities in particular have made extensive efforts to densify existing urban areas and to preserve open space on the edge of cities. A recently published report has revealed decreasing potential for inward development in Germany (BBSR 2022), which on the one hand is due to a remarkable mobilization of infill capacity for residential and commercial use, but on the other hand also shows that developable land within the built-up city is a finite resource. Moreover, local residents often oppose extensive urban densification (Wicki/Hofer/Kaufmann 2022; Wicki/Kaufmann 2022). Although there have been no empirical studies on the association of land availability and land prices in Germany, increases in prices due to scarcities of building land are repeatedly mentioned in the political arena (see for example Pfeiffer 2005).

However, it can also be argued that numerous other factors affect housing supply, market prices and housing affordability. Regional economic and income growth (and the respective willingness to pay for housing), the availability of amenities, the “financialization” of the housing market and the role of real estate speculation also influence local housing markets and land prices (Phillips/Goodstein 2000; Downs 2002; Taylor 2016; Wetzstein 2017; Pinnegar/Randolph/Troy 2020). Aring (2005) argues that more prosperous regions with a higher willingness to pay for housing experience higher land price levels. Efforts to expand supply would have a limited effect in such areas. Although the prices could be reduced by making room for more development, regional and local price peaks would not be levelled out. The effects of supply-oriented land policies should therefore not be overestimated. This is confirmed by a study on land price development in the Zurich region, which found no association between the supply of zoned building land and land prices (Kuster-Langford 1995). In contrast, the relevance of speculative market behaviour was emphasized: “The opportunity of investing capital with a high potential for value growth and/or securing a share of the increasingly scarce resource of land by purchasing land can also be of considerable importance for price setting” (Kuster-Langford 1995: 167, translation by authors).

German land policy has been unable to limit the upward development of price levels. In the neoliberal years of the 2000s and 2010s, state agencies and municipalities further fuelled the market by selling properties at top prices. This contrasts with other European countries and cities, where municipal land policy has been able to curb the escalation of land prices with public acquisition models and other pol-

icy tools (Kuster-Langford 1995; Priemus 1995). Furthermore, the low interest rates of the 2010s led to a strong influx of capital into the metropolitan real estate markets (Krätke 2014), which has undoubtedly accelerated price developments. Real estate was considered a safe investment by both private and institutional investors (Heeg 2013; Schipper/Wiegand 2015). In this context, speculative expectations and corresponding market behaviour play a major role. In a certain sense, housing “has become essentially a central element of investment capital growth-seeking strategies, rather than a way of securing a place to live” (Pinnegar/Randolph/Troy 2020: 323).

Such trends were further exacerbated by the fact that the German urban land and housing market – as in other Western countries – was undervalued after decades of deindustrialization and suburbanization. In line with Smith’s rent gap theory, a wave of real estate investment has been observed since the 2000s in urban areas with large differences between current land values (and rents) and values potentially achievable after revitalization and modernization measures. The upgrading of older working-class areas through high-quality residential construction (often in the form of condominiums) and knowledge-intensive and creative industries continues to be the declared policy of many major German cities (Gerhard 2012).

3 Data and methods

As mentioned in Section 1, we use time series data from the BORIS system on standardized land values for all municipalities of the federal state of North Rhine-Westphalia (NRW). Land values are a legally defined term; they indicate average locational values for a defined land-value zone (see §196 para 1 BauGB).⁴ Due to data protection regulations, individual property prices in Germany are not publicly available and are therefore aggregated to so-called land-value zones (Meinel/Reiter/Walz et al. 2020: 274). These zones encompass areas that are homogenous in terms of the type and intensity of building utilization and are typically much smaller than municipalities, local districts or neighbourhoods (see Figure 1). The primary data source for determining these values is the purchase prices of properties, which notaries are required to provide (Teuber/Ziems/Reiche et al. 2016). In areas with no recent property transactions, prices from comparable areas or past transactions

⁴ Baugesetzbuch (Building Code) as of 3 November 2017 (BGBl. I p. 3634), last amended by Article 3 of the Act of 20 December 2023 (BGBl. 2023 I No. 394).

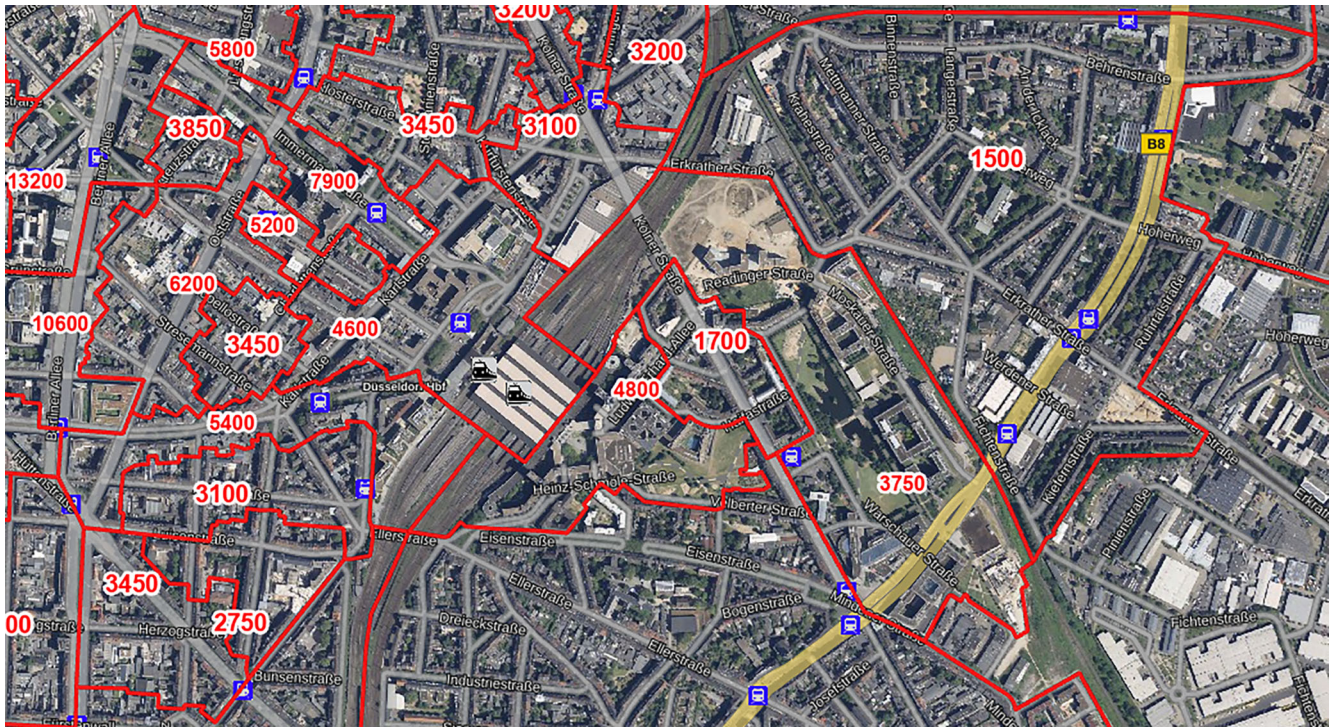


Figure 1 Land values (euros/m²) in land-value zones in the area of Düsseldorf Central Station Source: BORIS.NRW, Geobasis NRW; Data license dl-de/by-2-0

are extrapolated using index series (§7 para 2 BRW-RL).⁵ In built-up areas, land values are calculated as if properties were unbuilt. Figure 1 illustrates the varying sizes of land-value zones around Düsseldorf Central Station.

The determination and publication of land values is the responsibility of local expert committees for land values (*Gutachterausschüsse für Grundstückswerte*) (OG NRW 2023). These committees are constituted as state-level agencies and operate within counties (as in North Rhine-Westphalia), municipalities (as for example in Baden-Württemberg) or at state level (as in Saxony-Anhalt). The members are local experts in the real estate market, working on a voluntary basis to enhance market transparency. In 2013, the initiative VBORIS (*Vernetztes Bodenrichtwertinformationssystem*) was launched in order to provide harmonized nationwide land values online.

For the purposes of this study, land-value data must not only be accessible but also processable as georeferenced information in a geographic information system. For North Rhine-Westphalia, the data is provided in shape format for the time series from 2011 to 2024 as a free download (the

data model used is version 4.0 from BORIS-NRW). This allows us to combine information on land values with additional geodata, including small-scale census data on the rent level and population development for a 100 m grid.⁶

Before land-value data can be analysed, certain preparatory steps are necessary. Land values are particularly suitable for deriving information from specific land-value zones for specific uses. For example, some zones contain comments with additional information that can only be taken into account when individual cases are analysed. For large-scale analysis, the data must therefore be aggregated to a certain extent. Although the data holds great potential for large-scale analysis (Meinel/Reiter/Walz et al. 2020), few studies have been conducted to date. As a result, the design of the data infrastructure is not yet suitable for such analyses.

The initial files contain between 63,000 and 82,000 polygons, depending on the year. Each polygon is assigned a land use based on a typology composing of seven main categories. As only built-up areas are relevant for our study, polygons categorized as forestry, agriculture, external area and other areas were excluded. This leaves polygons categorized as “single- to two-story development” (residential

⁵ Richtlinie zur Ermittlung von Bodenrichtwerten (Directive on the Determination of Standard Land Values) (Bodenrichtwertrichtlinie – BRW-RL) of 11 January 2011.

⁶ https://www.zensus2022.de/DE/Ergebnisse-des-Zensus/_inhalt.html#_kh5ks82a8 (23.01.2025).

use with low density), “mixed- or multi-story development” (residential and mixed use with higher density) and “commercial/industrial/special area” (commercial and industrial use).

The data model includes a second categorization by land-use types which distinguishes more specifically between 41 land-use categories. For this study, these categories were aggregated into two overarching groups “residential/mixed” and “commercial/industrial”. The merging of residential and mixed-use areas proved to be practicable, as there are differences in the practice of land-use classification among expert committees, especially with regard to the distinction between residential and mixed-use areas. This applies in particular to village centres and central business districts/central areas.

Due to the fine-grained mix of land uses, many land-value zones are associated with multiple polygons, each reflecting the value for a specific use. However, in some cases, multiple polygons with the same use exist for a single zone. In such instances, the polygon with the higher value for the same use was retained for further analysis, while the others were removed. Polygons with a land value of zero were also excluded. The abstraction process resulted in a reduction of the total number of polygons to a range of 46,000 to 50,000 per year.

During the study period, some expert committees assigned comprehensive values across municipalities for both residential and commercial uses. These values serve as a sort of fallback if the areas are not already covered by a land-value zone. The resulting polygons also cover non-urban areas and other uses that do not correspond to the polygon’s assigned land use. These polygons were excluded because their typically low values and large sizes meant that retaining them would distort the results downwards. The values for the year 2011 had to be excluded due to differences in the data structure and missing values for some municipalities.

At the municipal level, for each year from 2012 to 2024, an area-weighted average land value for residential/mixed and commercial/industrial uses was calculated. For area weighting, the land values were first multiplied by the area size of their respective land-value zone. Subsequently, the land-value zones were dissolved for each municipality (or grid cell) and land-use category. The previously calculated product for each zone (measured in euros) was thereby summed. Finally, to calculate the average value of a municipality, the sum was divided by the total area of the land-value zones for a given land-use category. The area weighting prevents, for instance, a small land-value zone with a very high land value disproportionately distorting the average upward.

In addition to calculations at the municipal or grid cell le-

vel, area-weighted averages were calculated based on a spatial typology that distinguishes between urban (core cities), suburban and rural areas (ILS 2024, see Figure 2). At the postal code level, a further delineation of urban areas was made based on population density. We also used 3-km buffer zones around the city centre of selected core cities in order to address land-value changes in central urban areas. Figure 3 provides an overview of the various steps in data preparation and processing.

4 Empirical findings

The average land value for residential and mixed-use properties in North Rhine-Westphalia rose from 183 euros per m² in 2012 to 331 euros per m² in 2022, an increase of around 81 % (see Figure 4). We see a continuous and accelerating upward trend until 2022, followed by a remarkable trend reversal in 2023 and 2024, when the previously robust growth rate initially flattened and then became negative. The severe real estate crisis following the turnaround in interest rates and the economic downturn left its mark on the urban land market.

The increase in commercial/industrial land use was significantly lower: Here, the value rose from 57 euros to 80 euros per m² (+41 %) in the same period. The latter reflects the lower return expectations for commercial land use compared to residential and mixed use. In the following, we focus on the development of land values for residential and mixed-use areas.

A look at municipal values shows – as expected – huge inter-regional differences in terms of both the absolute level and the rates of change (see Figure 5). For residential and mixed-use properties in 2024, land was most expensive in the state capital Düsseldorf (1,572 euros per m²), followed by the core cities of Cologne (1,211 euros per m²) and Münster (973 euros per m²). In economically weaker cities such as Dortmund, Essen and Bochum, land values were at a much more moderate level (455 euros, 404 euros and 413 euros per m² respectively).

Above-average increases in land values in the years 2012 to 2024 can be seen in the area between Düsseldorf and Bonn (the River Rhine axis), the Paderborn region, the northern Münsterland and parts of the Rhenish district. At municipal level, the largest increase was found for the city of Münster, where land values almost tripled (192 %). In second place are a number of suburban municipalities in the near vicinity of major cities, such as Troisdorf, Bad Honnef and Königswinter. Here, the growth rates range between 150 and 180 %. The core cities of Düsseldorf (107 %) and Cologne (137 %) show somewhat lower values, although the absolute increases in these cities are

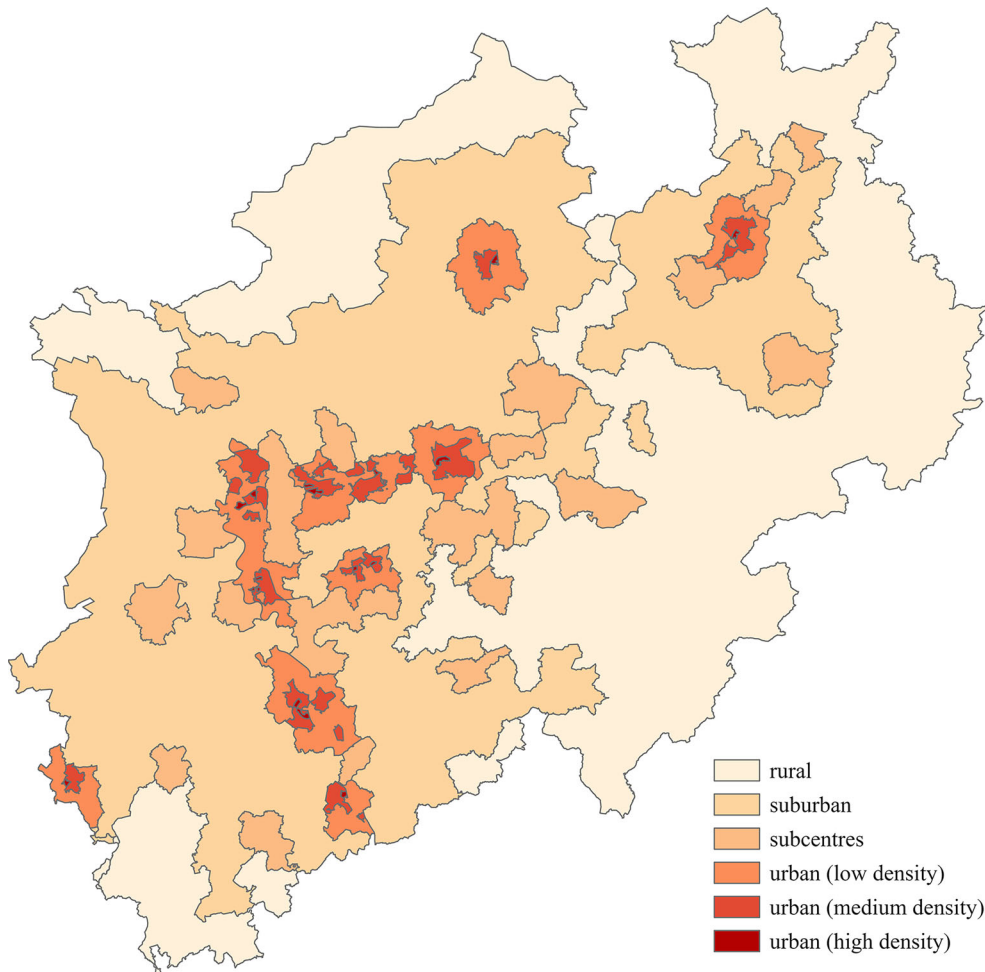


Figure 2 Spatial typology distinguishing sub-regions across the urban-rural gradient Source: the authors, based on <https://ils-stadtregionen.de/>

significantly higher than in suburban municipalities. The above-average increases in land prices in economically strong cities are not surprising. Table 1 shows that the so-called top five cities (Cologne, Düsseldorf, Münster, Bonn and Aachen) deviate significantly from the average for North Rhine-Westphalia in terms of both population and employment growth.

Nevertheless, the data shows that skyrocketing land prices cannot be regarded as a phenomenon affecting only a few major cities. On the contrary, spatial spillover effects into neighbouring suburban areas are evident. It is remarkable that in 55 municipalities in North Rhine-Westphalia, land prices at least doubled in the period under review. At the same time, it should be noted that in a considerable number of all municipalities ($n = 61$), the increase in land prices was no higher than the 27% inflation rate during the relevant period. In these municipalities, the real value development was therefore negative.

If land values and land-value increases are considered

using the spatial typology presented in Section 3 (see Figure 2), the outstanding position of major cities nevertheless becomes clear (see Figures 6 and 7). The absolute increases in the three core-city area types (with high, medium and lower population density) range between 377 euros and 488 euros per m^2 . In regional sub-centres and suburban municipalities, on the other hand, the figures are only 141 euros and 115 euros respectively. In the centres of economically strong cities (such as Düsseldorf, Münster and Cologne), prices have developed particularly dynamically.

Figure 8 shows the area-weighted land values for the 3-km radius around the centre of selected core cities, which represents the central business district and nearby urban areas. Values of 3,500 euros (Düsseldorf) and well over 2,000 euros (Cologne) and 1,500 euros per m^2 (Münster) were found here for 2024. The growth rates since 2012 are also at a high level compared to the state average (81%), with values between 100 and 200%. It should be noted, however, that the highest growth rates are not to be found

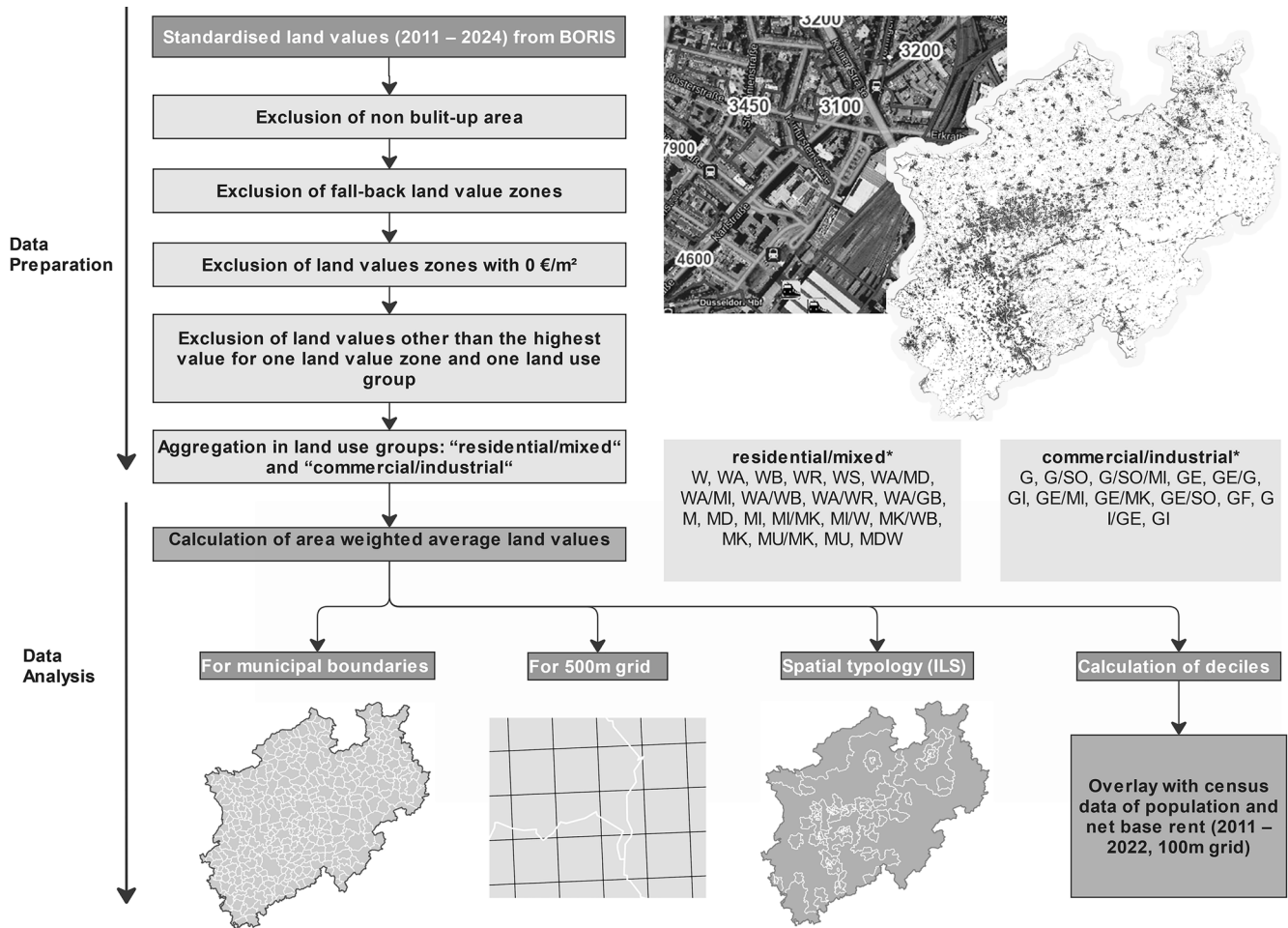


Figure 3 Overview of the procedure of data preparation and processing Data license dl-de/by-2-0

in the most densely populated inner-city zones, but rather in fringe areas of core cities with lower population density but still good accessibility to the city centre (see Figure 6 and Figure 7, right). This may indicate a higher potential for real estate upgrading there, in contrast to traditional high-price (and already gentrified) zones around the city centre.

Since the area size of the land-value zones is included in our data model, theoretical capital assets can be calculated with a simple multiplication of the land value and area size. For 2024, the amount of 1.34 trillion euros is calculated for the statewide stock of residential and mixed-use land. In 2012, this value was only 0.66 trillion euros. However, this capital asset is extremely unevenly distributed within the municipal system of North Rhine-Westphalia, and the degree of inequality has increased significantly since 2012. The Gini coefficient (addressing the inter-municipal capital concentration) for 2024 is 0.733; in 2012 it was only 0.681. Remarkably, the ten cities with the greatest land capital

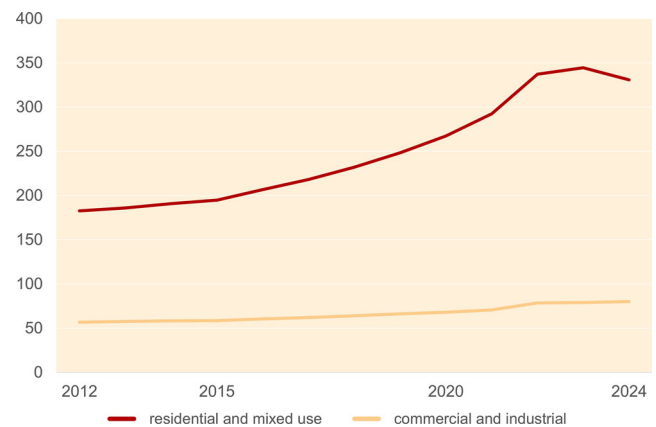


Figure 4 Area-weighted land values for residential/mixed-use areas and commercial/industrial areas in North Rhine-Westphalia, 2012–2024 (euros/m²) Source: the authors, based on BORIS.NRW; Data license dl-de/by-2-0

Table 1 Population and employment growth in North Rhine-Westphalia, independent cities and top five cities (Cologne, Düsseldorf, Münster, Bonn and Aachen)

	NRW	Independent cities	Top five cities
Population change 2012–2023 (%)	3.6	4.4	6.7
Employment change 2012–2024 (%)	18.4	19.1	23.3

Source: the authors based on Landesdatenbank NRW

asset accounted for over 45 % of the state's total sum in 2024, compared to only 38 % in 2012.

It is also noteworthy that the strongest population growth in the period under review occurred in land-value zones with the highest values (> 540 euros/m²) and highest rental prices (on average 8.43 euros per m², see Figure 9). This indicates a close interaction between land market development and construction activity, although we were not able to include data on small-scale building activities. Figure 9 shows the ten deciles of land-value zones for residential and mixed use ($n = 3,891$ for each decile) according to their area-weighted land value in 2024. The tenth decile, which represents zones with highest values, not only had a disproportionately high population (in 2022, 17.8 % of the population in North Rhine-Westphalia lived in this area,

accounting for 14.8 % of the total area). The population growth there was also disproportionately high. Almost 30 % of the growth between 2012 and 2024 took place in areas with the highest land prices. This corresponds to an absolute increase of about 155,000 people, while the other nine deciles account for an average increase of just 40,000 people. Agglomeration economies, urban amenities and the social proximity buzz seem to make urban areas still attractive for a population group of considerable size.

5 Discussion

Overall, our data shows strong land market polarization in North Rhine-Westphalia. Strong or even excessive growth rates of land prices are a spatially selective phenomenon. We see a significant urban-rural divide – as expected from a theoretical perspective – in absolute values as well as in rates of change. Economically successful core cities on the Rhine axis as well as prosperous core cities in rural regions like Münster and Paderborn are particularly affected by above-average price levels and changes. At the same time, the upward trend is spreading to city fringes and neighbouring suburbs. In contrast, some rural areas experienced falling real land prices because nominal price developments are below the inflation rate.

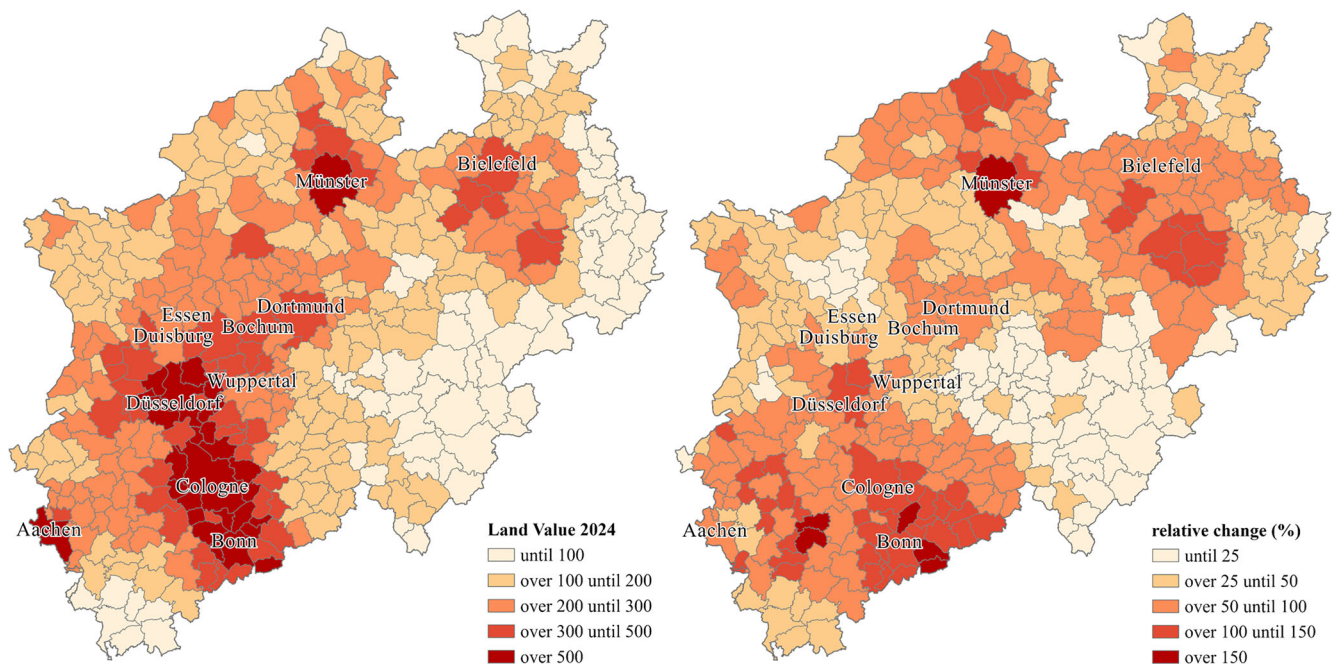


Figure 5 Area-weighted land values and change in area-weighted land values for residential and mixed-use areas at municipal level, 2012–2024. In Figures 5 and 6, the values for the municipality of Mönchengladbach are based on the year 2013, as no data was available for 2012 Source: the authors, based on BORIS.NRW; Data license dl-de/by-2-0

The primary cause for the dramatic increase in land prices in prospering cities is likely to be the strong rise in demand for urban residential and commercial space since the turn of the millennium, which is often referred to as the “reurbanization” of metropolitan cores (Siedentop 2018). In Germany, the country’s ten largest cities increased their populations by 1.3 million inhabitants and their employment by 1.8 million employees between 2003 and 2022. If price developments on the real estate market are viewed in longer time series (which is shown in Figure 10 for the develop-

ment of prices for single-family homes), the significance of the post-2010 development becomes particularly clear.

In this context, the literature often refers to the creation of well-paid jobs in knowledge-intensive sectors, which has resulted in demographic pull effects (Storper/Manville 2006; Geppert/Gornig 2010). Other researchers point to changing consumer preferences of certain population groups. With the transition to a post-industrial and post-Fordist economy, a “new middle class” has emerged with an increased affinity for city-centre living (Ley 1986; Hamnett 1991). Young people in particular are attracted by amenity-rich urban

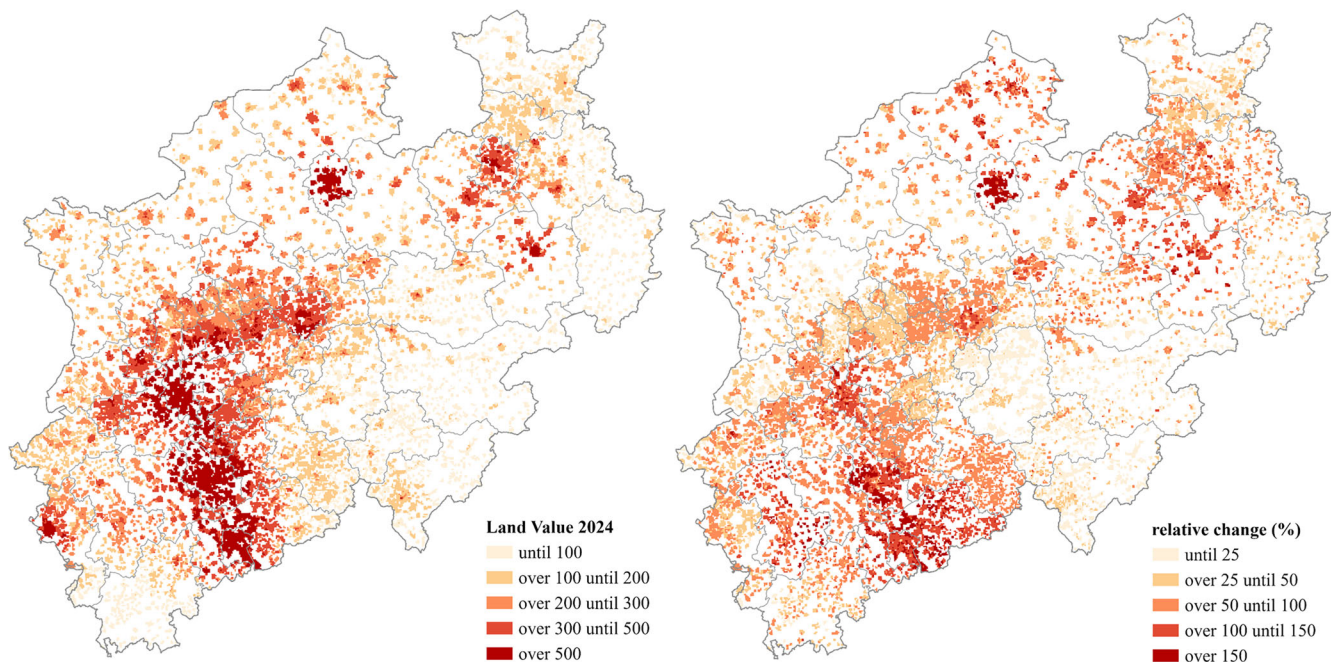


Figure 6 Area-weighted land values and change in area-weighted land values for residential and mixed-use areas at the level of 500m² grid cells, 2012–2024 Source: the authors, based on BORIS.NRW; Data license dl-de/by-2-0

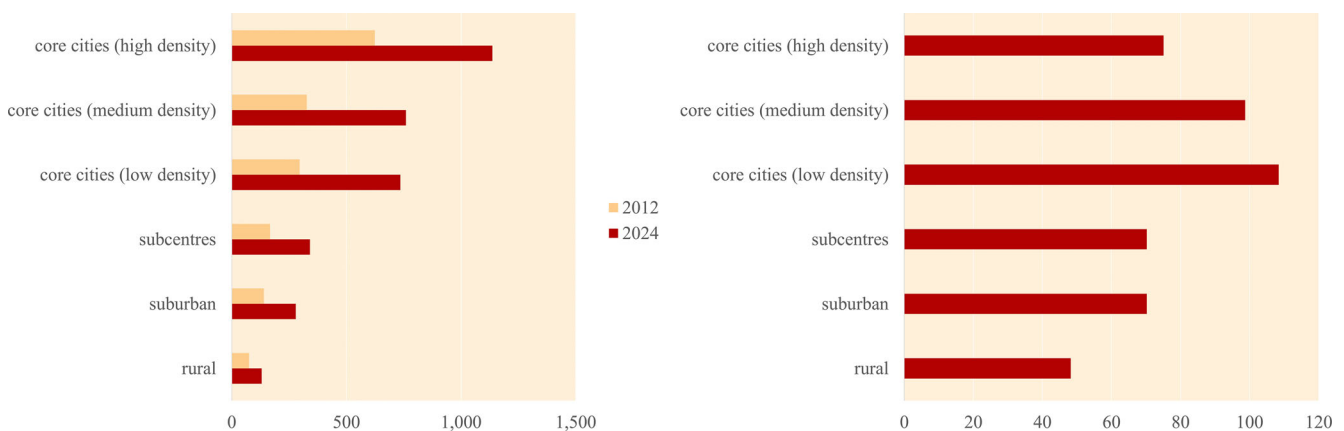


Figure 7 Area-weighted land values (euros/m², left) and area-weighted change in land values (% , right) for residential and mixed-use areas at the level of sub-regions, 2012–2024 Source: the authors, based on BORIS.NRW; Data license dl-de/by-2-0

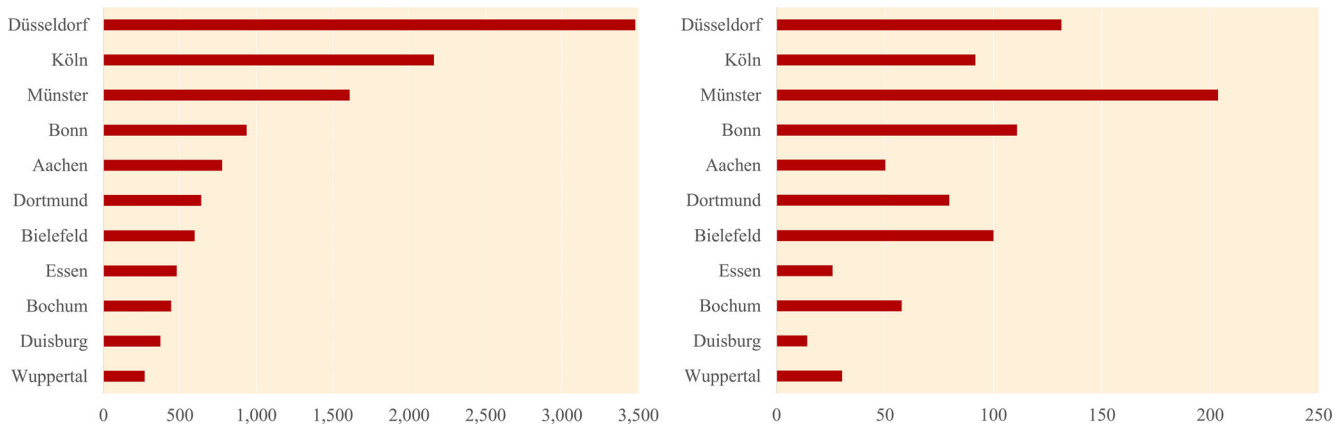


Figure 8 Area-weighted land values for residential and mixed-use areas (left, euros/km², 2024) and area-weighted land-value changes (right, percentage, 2012–2024) for the 3-km radius around the city centres in the ten largest cities in North Rhine-Westphalia Source: the authors, based on BORIS.NRW; Data license dl-de/by-2-0

neighbourhoods and their “proximity and buzz” advantages (Nathan/Urwin 2005: 30). This has been reinforced by demographic cohort effects and the “academization” of education (Simons/Weiden 2016; Siedentop/Zakrzewski/Stroms 2018; Moos/Revington/Wilkin et al. 2019).

Spatial planning has obviously been unable to respond to this surge in demand by increasing land supply. The 2020 monitoring report on the stock of developable land in the state of North Rhine-Westphalia found that the cities of Düsseldorf, Cologne and Bonn had building land reserves for residential use of between 2 and 4 m² per inhabitant, which is well below the state average of 9 m² (MWIDE 2020: 76). The city of Münster had only slightly more land potential in legally binding land-use plans (10 m²). The reasons for the scarcity of developable land are primarily the protection of open spaces in regional plans (Eichhorn/Pehlke 2022), but also restrictive local planning laws that impede the densification of built-up areas.

However, it would be misleading to focus the discussion of causal factors on the land supply side alone. Rising land prices are also an indication of intended real estate upgrading in a close interplay between urban development policy and the real estate industry. The capitalization of so-called rent gaps appears to play a decisive role in this context (Smith 1979; see Section 2). Therefore, it is not only purely economic market forces that cause real estate valorization. Rather, market-friendly neoliberal policies related to the concept of the “entrepreneurial city” and claims to strengthen “competitiveness” play a decisive role in this regard (Schipper/Wiegand 2015).

Following this line of argument, reurbanization can be understood as a strategy and the outcome of the structural upgrading of inner-city areas with the aim of improving image and gaining global attention (see Gerhard 2012 and Rink/Schönig/Gardemin et al. 2015 for details).

In the course of a competitive quest for global visibility, the centres of large cities have become a “presentation stage” (Gerhard 2012: 63). The most visible sign of this policy orientation can be seen in prestigious large-scale urban redevelopment projects and increases in high-priced housing construction. This has mainly taken place on former brownfields and vacant land. However, the enormous expansion of housing production in major German cities since the 2000s has not prevented land prices rising. This raises the question of whether land price increases indicate tight land markets, reflecting a shortage of supply and high demand, or whether there are other causes such as speculation on price developments (see Reiß-Schmidt 2018; DASL 2019).

One interesting finding of this study is that high-price areas (in terms of both land costs and residential rents) exert above-average demographic pull (see Figure 9). However, our data does not allow us to examine the temporal relationship between land price changes, population trends and residential construction activity in more detail. Nevertheless, it could be assumed that immigration into core cities took place at a time when housing costs there were still more moderate (see Figure 10). Population growth then led to a gradual increase in land prices, which weakened the growth trend over time. On the other hand, it could also be argued that high-priced residential construction in undervalued neighbourhoods, fuelled at least in part by speculative investment, has led to upward revaluations. This also impacts adjacent neighbourhoods. The debate about “new-build gentrification” and the effects of “price shadowing” has highlighted similar phenomena for some time (Davidson/Lees 2010: 398; Rérat/Söderström/Pigué et al. 2010: 432). The densification of neighbourhoods, often associated with density upzoning, plays an important role here. In line with Pinnegar, Randolph and Troy (2020: 324), it can also be assumed for Germany that growth-oriented develop-

Land value (€ / m ²), upper limit of the lower 9 deciles	Decile	Area share 2024 (%)	Population 2022 (1,000)	Population change 2011-2022 (1,000)	Percentage of state population 2022	Percentage of state population growth 2011-2022	Mean residential net base rent (€ / m ²)
	10	14.7	3,809.5	155.0	17.8	29.9	8.43
	€ 540						
	9	10.5	2,590.6	93.6	12.1	18.0	7.03
	€ 400						
	8	8.2	2,143.3	75.8	10.0	14.6	6.57
	€ 330						
	7	9.1	2,305.0	51.7	10.8	10.0	6.32
	€ 280						
	6	8.5	2,232.1	41.7	10.4	8.1	6.09
	€ 245						
	5	9.1	2,193.5	44.5	10.2	8.6	5.96
	€ 225						
	4	10.8	2,221.5	51.4	10.4	9.9	5.91
	€ 180						
	3	10.9	1,866.2	32.9	8.7	6.3	5.76
	€ 135						
	2	9.6	1,230.0	5.5	6.1	1.1	5.53
	€ 90						
	1	8.6	770.5	-33.0	3.6	-6.4	5.00

Figure 9 Population change statistics for deciles of land-value areas, according to 2024 land values Source: the authors, based on data from the Federal Statistical Office (Zensus 2022) and BORIS.NRW; Data license dl-de/by-2-0

ment models are rolled out from high-density to moderate-density neighbourhoods and “from vacant sites to complex, peopled neighbourhoods”.

6 Conclusions

In this paper, we present an in-depth analysis of land price developments over a period of 13 years for the federal state of North Rhine-Westphalia. For this purpose, we have used geo-referenced and annually updated standard land values, provided by the expert committees for land values and the digital BORIS system. This database is particularly suitable for revealing small-scale patterns of price trends. To the best of our knowledge, our paper is the first to systematically analyse this data below the level of municipal aggregates for a federal state.

We observe a strong spatial concentration of land-value increases and signs of a spatial polarization between demographically and economically dynamic urban areas on the one hand and rural “left-behind” areas on the other. Given

the intensity of spatial concentration, changes in land values undoubtedly have an impact on the wealth distribution of the population, as Westermeier and Grabka (2017) have shown using real estate price data for Germany as a whole. In other words, the urban population owning real estate has become wealthier over time, while this effect is largely unseen in many rural regions where nominal price increases were often below the inflation rate. It should be borne in mind here that land price increases represent non-performance-related capital gains. The findings presented here are thus of particular importance for the debate on spatial justice and territorial cohesion in a country like Germany.

The development of land prices mirrors the massive reurbanization of the 2000s, as manifested in shifts of economic output and population towards metropolitan areas. Unfortunately, our methodological approach is not suitable for uncovering the complex causality of rising land costs over time. However, based on the literature, we doubt that land price increases can be interpreted solely as a sign of supply scarcity in the market. While land supply shortages in cities like Cologne, Düsseldorf or Münster are evident, it would

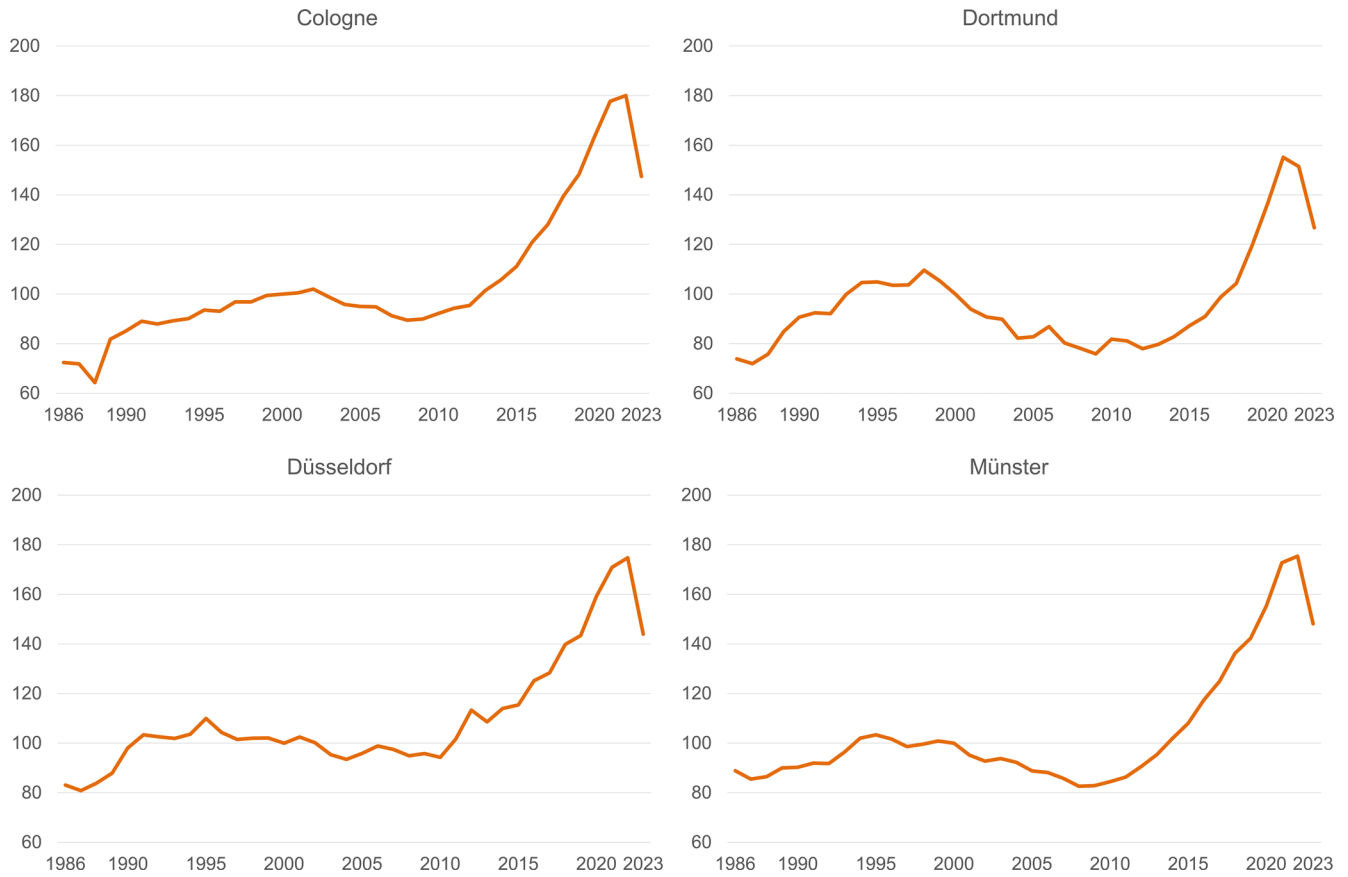


Figure 10 Price index for single family houses in selected core cities in North Rhine-Westphalia (1986–2023, 2000 = 100) Source: the authors based on data from the German Real Estate Index (GREIX); Amaral/Dohmen/Schularick et al. (2023)

be naive to believe that the mobilization of further development capacities (in the form of densification or building at the urban fringe) can have a short or medium-term effect on land prices. Land prices articulate long-term expectations regarding the utilization of land. Economic and demographic reurbanization, reinforced by neoliberal, competition- and growth-oriented urban policies, has contributed to a robust belief in the profitability of real estate capital in economically successful cities. The enormous influx of capital into the real estate markets during the low-interest phase of the 2010s reinforced this development. The break in the price trend since 2022 as an outcome of the turnaround in interest rates and the overall economic slowdown appears to confirm this assessment.

We see a substantial need for further research in this context. Future studies should focus primarily on the complex causal relationships between the demand for residential and commercial space, the supply of developable land and related pricing mechanisms. However, this presupposes the availability of up-to-date and disaggregated data on building land capacities in inner urban areas and on greenfield sites. Small-scale data on market transactions (such as the

repeated sale of undeveloped properties with building permission) would also help to better identify speculative market developments. We also see a need for more research concerning the effects of urban land policy. Here, little is currently known about the effectiveness of specific policy instruments – such as public acquisition models or inclusive zoning – and in particular their ability to curb land price developments.

It cannot be assumed that land prices will fall in the future. On the contrary, it is much more likely that continuing population growth in Germany, increasing competition for productive land use and an intensifying pressure to densify existing built-up areas will lead to stabilization at a high level or even further price increases. The federal government, federal states and local authorities are called upon to counter this development with an active land policy aimed at benefiting the common good to a greater extent than in the past.

Competing Interests The authors declare no competing interests.

Acknowledgements We would like to thank two anonymous reviewers for their helpful comments.

Funding We would like to thank the German Research Foundation (DFG) for funding our research [grant number SI 932/14-1].

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