Socio-Economic Aspects of Urban Development

Unit 11: What is Gentrification?

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Overview of Unit 11

- What is gentrification? - A definition
- Case Study: Gentrification in various neighborhoods in Berlin
- Predicting gentrification
  - A study using machine learning methods and data on housing, occupation and socioeconomic status from London
- The role of amenities in gentrification
  - Upmarket cafés in American cities
  - Amenities that go in line with gentrification in China
- Class discussion: Advantages and disadvantages of gentrification

What is Gentrification? - A Definition

Lees et al. (2008) discuss the origin of the term *Gentrification* in their book:

- The word derives from *gentry*: 'well-born, genteel and well-bred people of high social class, especially in the past' (Cambridge Dictionary)
- It has been coined by the English sociologist Ruth Glass in 1964, rather disparagingly and with an ironic undertone. She writes about neighborhood change in London (for example Islington):
  - *"One by one, many of the working class neighbourhoods of London have been invaded by the middle-classes—upper and lower. Shabby, modest mews and cottages — two rooms up and two down — have been taken over, when their leases have expired, and have become elegant, expensive residences ... Once this process of 'gentrification' starts in a district it goes on rapidly, until all or most of the original working-class occupiers are displaced and the whole social character of the district is changed.*
    While the cores of other large cities in the world, especially those in the United States, are decaying, and are becoming ghettos of the 'underprivileged', London may soon be faced with an embarrass de richesse *in her central area - and this will prove to be a problem, too."*

What is Gentrification? - A Definition

- Lees et al. (2008) define gentrification as *the transformation of a working-class or vacant area of the central city into middle-class residential and/or commercial use*.
- It is a now a phenomenon of neighborhoods in many cities across the world and the details may vary a lot with the circumstances (urban planning, business environment, social circumstances). Look at the damaged historic building next to a modern loft tower in Mexico City



A Three-Step Gentrification Process

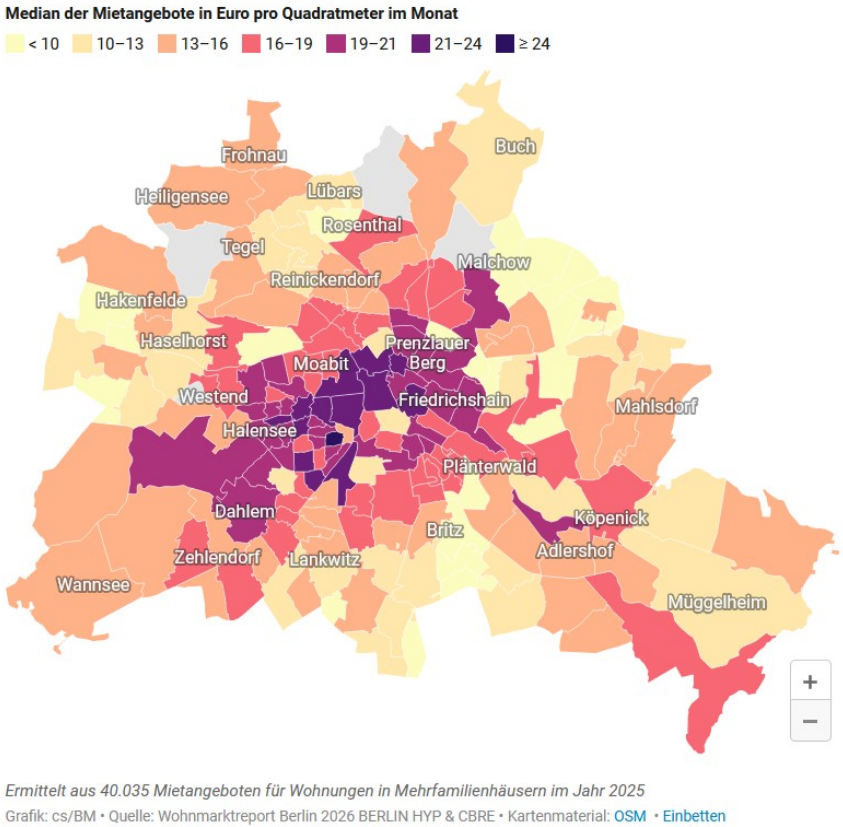
According to Lees et al. (2008), gentrification will in many instances follow a three-step process:

1. **Artists**, writers, musicians, university students, the LGBT community, political activists etc., are attracted to a neighborhood for its rent affordability and tolerance.
2. **Upper-middle-class professionals**, often politically left-leaning and socially liberal, are attracted to a neighborhood that now has the reputation of 'vibrant' and 'cool' thanks to the first arrivals.
3. **Wealthier people** move in and real estate prices increase significantly, more than in the first stages. This will price out and exclude not only many of the original residents but also a number of the people that arrived in stage 1 and 2.

All along the process, **local businesses** and shops change to cater to the needs of the respective current residents and to constitute the amenities (art galleries, restaurants, night clubs etc.) they are attracted to.

Case Study: Berlin

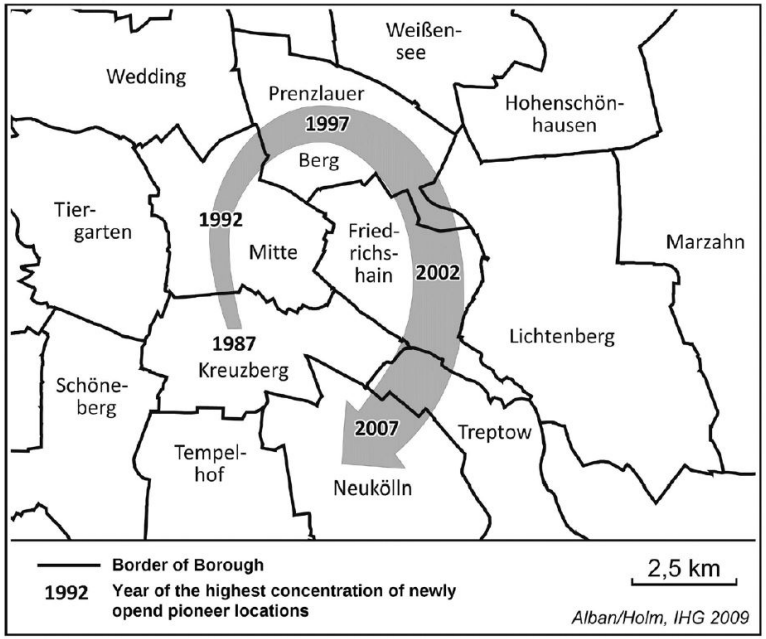
- Median rental data (in euro per square meter) for apartments is shown for Berlin districts in 2025.
- Which of the more expensive areas have always been home to richer residents? Which have become gentrified in recent years/decades?



Gentrification in Various Berlin Neighorhoods

- Holm (2013): Prenzlauer Berg as a showcase of *family gentrification*, Mitte of *touristification*, Neukölln houses *creative international pioneers*, Wedding might be the next hot spot...
- Partially, the differences can be explained by different stages of the gentrification process. He looks at starting dates of gentrification (measured as the concentration of newly opened pioneer locations - clubs, galleries, subcultural bookstores)

Figure 2: Spatial Dynamic of Pioneer Locations in Inner City Neighborhoods in Berlin (1987-2009)



Gentrification in Various Berlin Neighborhoods

- Holm (2013): In Berlin, the first stage of pioneer gentrification by the creative class is typically followed by investment in the housing stock. $\Longrightarrow$ Economic displacement of low-income households $\Longrightarrow$ *Super-gentrification* with luxury apartments, as seen in parts of Prenzlauer Berg and Mitte
  - In 1993, residents of Prenzlauer Berg and Mitte had 75% of the average Berlin income level. In 2007, just 14 years later, they had 140%.
- Kreuzberg as a special case: Reinvestment in the existing housing stock came in the 1980s already, even before reunification. It has since been followed by an intensive influx of pioneers and gentrifiers and a second wave of upgrading.
- Berlin also shows the movement of the gentrification pioneers to new neighborhoods every five years or so.
  - In part driven by the cultural argument to 'discover new and authentic places', but also by price developments, both in the residential and retail segment.

Gentrification in Berlin - Neukölln

- **Berlin-Neukölln until the mid-2000s: Working-class district with a large migrant population, old housing stock, bad reputation**
  - Crime, decay, anti-social behavior. 'Failure of integration' of numerous working-class Turkish- and Arabic-origin populations.
- **From the mid-2000s/2010s: Gentrification and image shift**
  - Low rents and proximity to Kreuzberg attracted students and other gentrification pioneers
  - New pubs, clubs, and coffee shops catering to the young, creative, and cosmopolitan
  - Considered hip - in particular by a global audience (artists, travelers):
    - ★ 2010: New York Times travel column promoted Neukölln as the *'ultimate nightlife recommendation for a 36-hour visit of Berlin'*
- **2020s: Mature gentrification, but social heterogeneity remains**
  - High market rents create displacement pressure, strong price divergence between new and existing rental contracts. Concentrations of social disadvantage persist alongside urban dynamics.

Gentrification in Berlin - Neukölln

- In 2023, TimeOut Magazine gives Neukölln *'rank no. 22 out of the 40 coolest neighborhoods in the world'*



Berlin, Germany

Once a small village on the outskirts of Berlin, Neukölln is now the city's most exciting district by far. Walk down any of the three main avenues – Hermannstraße, Karl-Marx-Straße and Sonnenallee – and you'll see family-owned green grocers next to third-wave coffee shops, each a part of the neighbourhood's distinct *Multikulti* feel. Neukölln celebrates these differences, and fights for them too: you'll often find protests and demonstrations outside Rathaus Neukölln or on Hermannplatz. Come rain or come shine, there's plenty to do – from art exhibitions at the Kindl Brauerei to a stroll across Tempelhofer Feld. And for a night out, Neukölln is unmatched. Natural wine, cheap beers, late-night dancing? You want it, Neukölln's got it, and with style to spare.

The perfect day A Middle Eastern brunch spread from Azzam is hard to beat. Once you're done, walk up Flughafenstraße with a pit stop in Slina and Ironic Gallery for some top-tier shopping before taking in Tempelhofer Feld from the the

Public Policy: Social Preservation Areas

- What can the city do if it wants to limit displacement of existing residents in gentrification processes?
- Berlin is increasingly **designating neighborhoods to be social preservation areas** (*'soziales Erhaltungsgebiet'*), where social preservation (*'Milieuschutz'* based on §172 BauGB) holds:
  - Intervention in the **upgrading/conversion** of the housing stock (no rent regulation!): Major changes in apartment layouts, luxury modernization, demolition, and conversion of rental apartments into condominiums require permission and can be restricted.
  - Rapidly expanding instrument: 22 areas in 2015 $\rightarrow$ 64 areas in 2020 $\rightarrow$ 82 areas in 2025. Around one third of Berlin's population now lives in a social preservation area
  - $\Longrightarrow$ Economic trade-off: less displacement-inducing upgrading and conversion vs. potentially weaker incentives to invest in housing quality

Predicting Gentrification: Reades et al. (2019)

- How can we predict gentrification?
- We can, for example, construct an index of gentrification and regress it on numerous explanatory variables from the past years. But many variables will be correlated with each other (for example, income with education and working hours) and will enter the relation in a nonlinear way.
- Reades et al. (2019): Large data sets with many variables and nonlinear relations... call for machine-learning methods: *'Understanding Urban Gentrification Through Machine Learning'*
- They use data from London from 2001 to predict neighborhood status in 2011, and 2011 data to predict the neighborhood status in 2021
  - Neighborhood = Lower Layer Super Output Area (LSOA), containing between 1000 and 3000 inhabitants living in between 400 and 1200 households

Predicting Gentrification: Reades et al. (2019)

- The socio-economic status of a neighborhood (as the outcome variable) is constructed as an index that combines
  - Household income (median value of the neighborhood)
  - Property sale value (also median value)
  - Occupational share (the percentage of the neighborhood's residents in the 'top' occupational classes)
  - Qualifications (the percentage of residents achieving a high educational qualification)
- In the construction of the index, the variables are re-scaled and standardized.
- And what are possible x-variables that can predict the future socio-economic status of a neighborhood?

Predicting Gentrification: Reades et al. (2019)

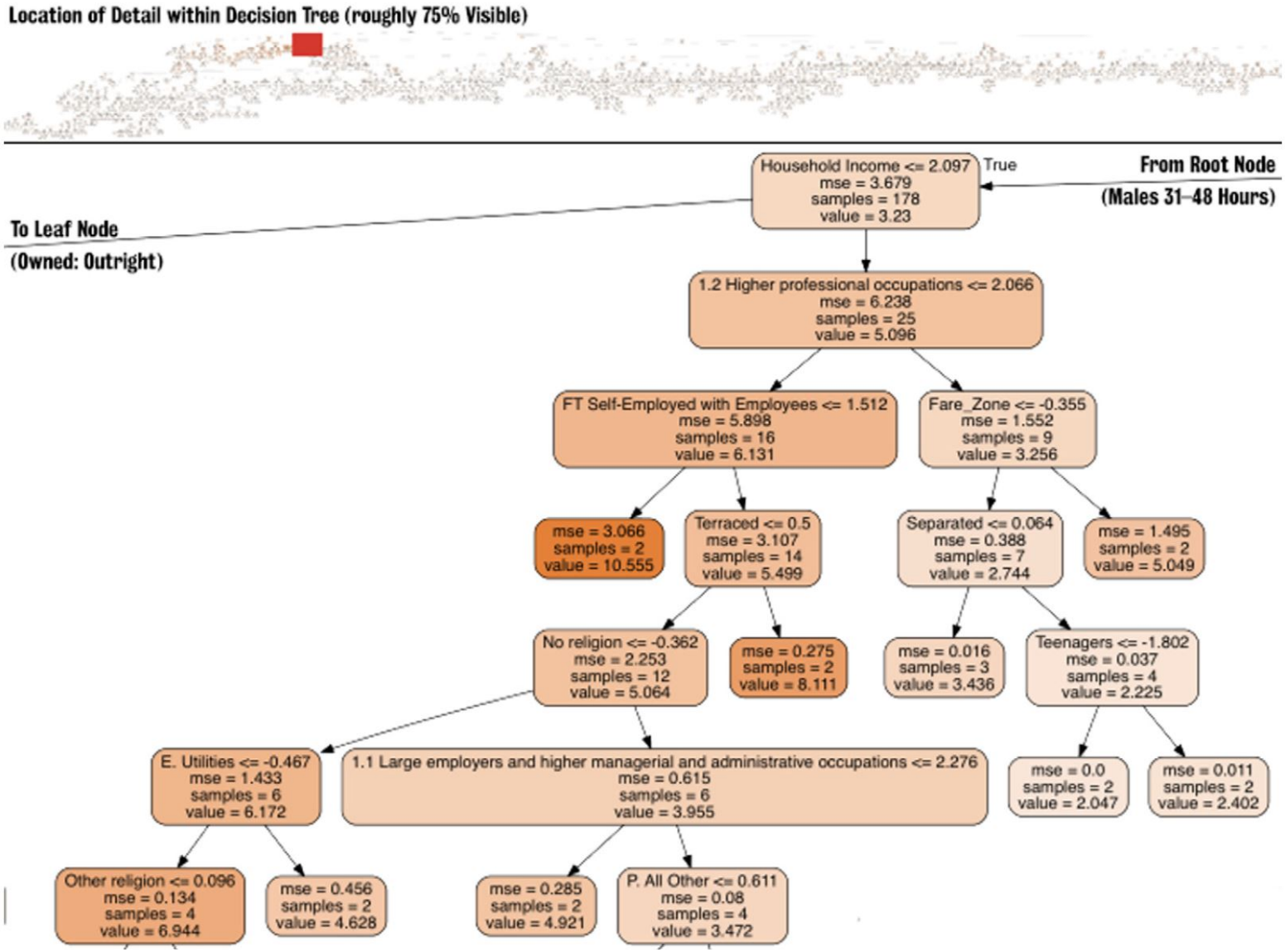
Reades et al. (2019) consider a total of 166 x-variables to predict future socio-economic status of a neighborhood. They come from different groups:

- Housing
  - Predominant building type (semi-detached houses, apartment blocks...)
  - Average dwelling age (pre-1900, 1900-1919, 1919-1930,..., after 1993)
- Household composition
  - Average number of people in the household, family composition, average age, number of children
  - Ethnic composition of the neighborhood
- Work
  - Average hours worked and predominant industry that employs workers
- Travel
  - Work-to-travel mode
  - Distance to the city center (defined as London tube station *Bank*): Driving time distance, public transport distance, cycling time distance

Predicting Gentrification: Reades et al. (2019)

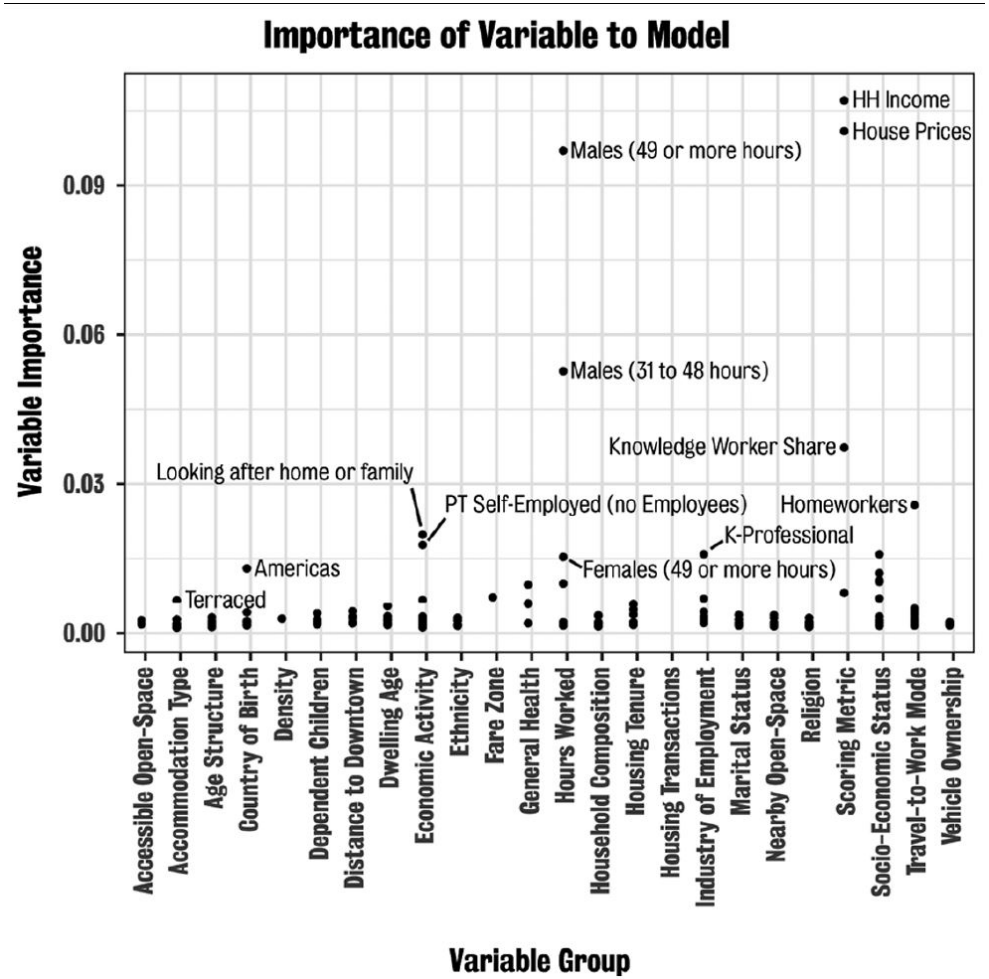
- The Machine Learning method used is **Random Forest**. It is based on decision trees.
- A decision tree uses a number of criteria - thresholds in the x-variables - to split the data set into increasingly homogenous subgroups.
- Starting with the whole set of neighborhoods, the algorithm applies the most decisive x-variables for future neighborhood status.
  - E.g. If this is average dwelling age: If the average building was built before 1945 $\Longrightarrow$ left branch of the decision tree, otherwise right branch
  - Next split: If there is a high share of men working 31-48 hours $\Longrightarrow$ left branch of the decision (sub-)tree, otherwise right branch
- After many sample splits, the leaves contain similar neighborhoods in terms of x-variables and with very similar socioeconomic status as outcome.
- New data: If you observe the x-variables of a neighborhood, follow it down the tree to the leaf and use the mean value of the leaf as the predicted future socioeconomic status.

Predicting Gentrification: Reades et al. (2019)



Predicting Gentrification: Reades et al. (2019)

Which variables are most important for predicting the future socioeconomic status of a neighborhood?



Predicting Gentrification: Reades et al. (2019)

- The Random Forest algorithm achieves an R^2 of 69.9% in the application with data from London
  - It can explain 69.9% of the variation of future socioeconomic status based on the interplay of these 166 variables observed 10 years ago.
- Results in line with the hypothesis that occupation and skills changes are main drivers of neighborhood change
  - Work-related variables are important (long working hours for men and women, skills and qualifications, and job flexibility such as self-employment and homeworking)
  - Immigration from EU countries, the Americas, and Oceania are also important $\Longrightarrow$ Global attractiveness of a neighborhood
  - Older buildings remain attractive
  - Family structure does not matter a lot: Gentrification is not purely driven by DINK (double income, no kids), but also by some well-off families with children that move to attractive areas in the inner-city

Amenities and Gentrification

In their predictive study of gentrification in London, Reades et al. (2019) do not consider amenities. Yet, certain (cultural /endogenous) amenities have been shown to go in line with gentrification.
Zeng et al. (2021) provide an overview of the amenities that have been **linked to gentrification** in the literature

- **Food stores and restaurants**
  - Coffee shops, exotic restaurants, gourmet food shops, health food shops, highest-quality greengrocers, 'specialty' food stores, slow food vendors, vegan/organic vendors...
- **Self-management and self-care**
  - Upscale gyms, yoga studios, upscale beauty salons, specialized medical facilities, alternative therapies, upscale hairdressers, vanishing laundromats (as new houses have washing machines)...
- **Creativity**
  - Art galleries, vintage stores, specialized boutiques, craft shops...

Starbucks and Gentrification: Glaeser et al. (2018)

- Glaeser et al. (2018) work with data from American cities at the ZIP code level and consider one particular amenity: the number of *Starbucks* cafés
  - Data on Starbucks cafés comes from Yelp
- Gentrification is measured by increases in house prices (House Price Index from Zillow)
- Period from 2012 to 2016: Panel data analysis, taking into account fixed effects at the year level and ZIP code level
- They consider contemporary growth in the number of Starbucks cafés, as well as lagged growth (column 3). In addition, they look at other upmarket cafés (columns 4-6).

Starbucks and Gentrification: Glaeser et al. (2018)

TABLE 1—CORRELATIONS BETWEEN ANNUAL PERCENT CHANGE IN HPI AND ANNUAL ABSOLUTE CHANGE IN THE NUMBER OF STARBUCKS AND CAFES ACROSS ZIP CODES (2012–2016)

	Percent change in HPI (1)	Percent change in HPI (2)	Percent change in HPI (3)	Percent change in HPI (4)	Percent change in HPI (5)	Percent change in HPI (6)
Yelp Starbucks/cafes growth	0.536	0.171	0.206	0.535	0.020	0.250
	(0.082)	(0.075)	(0.087)	(0.023)	(0.023)	(0.024)
Yelp Starbucks/cafes growth (lag1)			0.261			0.277
			(0.086)			(0.024)
Yelp Starbucks/cafes growth (lag2)			0.195			0.292
			(0.070)			(0.024)
Yelp growth in closed Starbucks/cafes			−0.042			−0.077
			(0.149)			(0.033)
Yelp Starbucks/cafes reviews growth			0.136			0.009
			(0.007)			(0.001)
Constant	−0.858	−0.826	−0.952	−1.523	−1.231	−1.679
	(0.057)	(0.056)	(0.061)	(0.044)	(0.043)	(0.048)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
ZIP fixed effects	No	Yes	No	No	Yes	No
Observations	24,865	24,865	24,865	59,180	59,180	59,180
Adjusted R^2	0.240	0.372	0.256	0.157	0.211	0.172

Notes: All regressions include a full set of calendar year dummies and cluster standard errors at the ZIP code level. Models (1) through (3) show correlations between HPI and Starbucks, and models (4) through (6) show correlations between HPI and cafes.

Starbucks and Gentrification: Glaeser et al. (2018)

- Positive correlation that is statistically and economically significant: One more Starbucks in a given year is associated with a 0.5 percent increase in housing prices.
- Nevertheless, the explanatory power is modest (R^2 of 0.24), showing that many more factors than Starbucks play a role in explaining variation in the house price index.
- Note that they are talking about correlation rather than causality
  - Is Starbucks leading the gentrification of the neighborhood? Or does Starbucks choose to open cafés in those neighborhoods that it expects to be on the upswing, hence Starbucks follows gentrification?
  - Yet, lagged Starbucks growth also turns out to be statistically significant, showing that Starbucks presence - at least to some extent - is leading the development. The number of reviews on Yelp also matters.

Various Amenities and Gentrification: Zeng et al. (2021)

Zeng et al. (2021) use a wider range of amenities to predict gentrification. They examine Shenzhen, China, using gradient boosted machines, a machine-learning method that is also based on decision trees (similar to random forest). Look at the 20 amenities considered most important by the algorithm:



Various Amenities and Gentrification: Zeng et al. (2021)

- Zeng et al. (2021) document that some amenities are China- or Shenzhen-specific and differ from findings from other countries
- Instead of Starbucks cafés, it is bubble tea cafés that are most strongly linked to gentrification (within the café category)
  - Image of stress relief and celebrity advertising, in contrast to the bitterness of traditional tea, very popular with the young and (conspicuously) well-off
- Personal care services (beauty salons, upmarket gyms), as well as sporting goods and hobby stores $\Longrightarrow$ Image of upward mobility and self-identity
- Motor vehicle dealers $\Longrightarrow$ Cars as status symbols
  - Only 20% of Shenzhen residents own private cars, license plate restrictions to limit congestion make cars a scarce and expensive good
- $\Longrightarrow$ While gentrification is a phenomenon that occurs in large cities across the world, it has strong cultural aspects that can be seen in the amenities and businesses in gentrified neighborhoods

Discussion: Advantages of Gentrification for Cities

- Gentrification happens in neighborhoods that are starting to **thrive**
  - New company creation
  - High-skilled workers move there
  - Purchasing buyer that contributes to the economy of the neigborhood - and the whole city
- **Renewal**
  - New building structures, investment in higher-quality apartments
  - Modern buildings are typically more energy-efficient and sustainable
- **Less crime**
  - The socio-economic and demographic changes make the neighborhood more secure, empirically leading to lower crime rates
- Negative consequences for poorer households can be **mitigated**
  - If poorer residents lose, is gentrification to blame or rather the lack of housing stock throughout the city? Incentives of the city to provide more affordable housing everywhere?

Discussion: Disadvantages of Gentrification for Cities

- Poorer households are **priced out** of gentrified neighborhoods because of rising rents
  - Even if they find housing elsewhere, it still means leaving behind the neighborhood they might have spent decades living in.
- Neighborhood **loses its identity**
  - Traditional buildings are torn down, shops close, and residents have to move out, making room for new arrivals that are not steeped in its history and authentic flair.
- Potential **segregation**
  - If only higher-income households can afford to live in the gentrified neighborhood, it will contribute to socio-spatial segregation (Unit 10).
- Potential **protests**
  - Can lead to protests and resistance, pitting current and new residents against each other and threatening social cohesion.

Wrap-Up of Unit 11

- If a formerly working class, vacant or derelict area in the central city is transformed into a middle-class residential area, we speak of **gentrification**.
- Gentrification **might take several stages**, in which first artists, then upper-middle-class professionals, and finally even wealthier people with the respective businesses catering to them, move in.
- As the Berlin case study has shown, particular neighborhoods may undergo **particular types of gentrification**, such as family gentrification of Prenzlauer Berg or the international creative pioneers of Neukölln.
- Using large amounts of data on building stock, inhabitants' occupation, education, and family structure, recent studies have tried to **predict gentrification** using machine learning methods.
- **Cultural amenities** have been linked to gentrification in various studies, ranging from Starbucks in the U.S. to bubble tea cafés in Shenzhen.

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