Do Institutional Investors Increase Industrial Rental Cost? *

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ABSTRACT

We find that the rapid growth of institutional ownership in the U.S. industrial real estate market from 2001 to 2022, despite increasing local ownership concentration, lowered the rental cost of industrial real estate properties. This result is robust to controlling for granular property characteristics, and to using mergers of institutions as plausibly exogenous shocks that increased concentration. We propose and find evidence for a novel channel underlying the finding: institutional investors, by consolidating the ownership of geographically proximate properties, mitigate the hold-up problem that tenants face when renting complementary industrial properties.

JEL classifications: G23, L14, R33.

Keywords: institutional investors, industrial real estate, rental cost, hold-up problem.

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1. Introduction

U.S. firms incur substantial expenditures on industrial real estate, and leasing represents a principal method of employing industrial real estate properties. For instance, Ghent, Torous and Valkanov (2019) find that nonresidential properties accounted for almost 30% of the assets of U.S. non-financial firms as of 2017, and Li and Yu (2023) find that capitalized rental expense accounts for roughly 20% of physical productive assets among U.S. public firms.[1] One major change in the industrial real estate market in recent years is the growing ownership of institutional landlords (WSJ, 2022; Business Insider, 2024). This trend raises a natural but important question: how does institutional landlords' ownership affect the rental cost of industrial real estate properties?

For an institutional investor, their investment strategy involves a tradeoff: holding properties at dispersed locations may have a diversification benefit, while holding nearby properties could minimize the monitoring cost.[2] We find that institutional landlords, in the industrial real estate market, tend to invest in geographically clustered properties. All else equal, such concentrated ownership within an area would lead to higher market power for institutional landlords, allowing them to charge higher rental prices. Surprisingly, we find that institutional ownership actually lowered the average rental prices. This result is robust to controlling for granular property characteristics, and to using mergers of institutional investors as plausibly exogenous shocks that increased institutional ownership in a local area. To explain this fact, we propose and test a novel channel: institutional ownership mitigates the hold-up problem that tenants face when renting complementary industrial properties.

Hold-up problems naturally exist in the industrial rental market. When a firm rents a site, the productivity of this site often depends on whether the firm can rent other complementary

[1] Li and Yu (2023) capitalize rental expense (XRENT) from operating leases and refer to this capitalized item as leased capital. Overall productive assets are the sum of leased capital and purchased tangible capital as measured by Property, Plant, and Equipment-Total (Net), that is, PPENT.

[2] Some literature studies how geographical diversification of the properties portfolio affects the value of real estate investment trusts (REITs) (Hartzell, Sun and Titman, 2014; Feng, Pattanapanchai, Price and Sirmans, 2021).

sites. As a result, after a site has been rented, the landlord of complementary sites can hold the firm up by asking for a higher rent. Within an area, sites that are close in distance are often complementary in industrial productions. When a tenant negotiates with a single or a few landlords that hold many complementary sites, the complementarity can be internalized and the hold-up problem is weaker. Institutional landlords – via owning geographically concentrated sites – can potentially mitigate the hold-up problem. Large tenants, who are more likely to operate multiple complementary sites, are particularly subject to the hold-up problem. We show evidence that their rental cost declined in particular as institutional ownership rises. The decline in large tenants' rental costs contributes to the decline of the average rental costs.

Over the past 20 years, institutional landlords' ownership in industrial real estate grew significantly. By industrial restate properties, we mean production sites such as warehouses, distribution centers, logistics facilities, manufacturing sites, and flex spaces. By institutional landlords, we mean banks, investment management companies, insurance companies, private equity funds, pension funds, and other funds. Ghent et al. (2019) provide a comprehensive survey that illustrates the importance of industrial real estate as an asset class for these entities and also discusses their ownership patterns over time. The fact that PE funds, including Bain Capital, KKR, and Blackstone, have been extensively purchasing industrial real estate properties has been widely covered by the media (see WSJ (2022); Business Insider (2024)). Our own estimate suggests that institutional landlords' ownership in terms of the square footage increased steadily from roughly 5–6% in the early 2000s to more than 12% by 2022.

We find that institutional landlords tend to hold tightly clustered properties in small geographical areas relative to non-institutional owners. Using data on the full stock of U.S. industrial real estate properties and their owners (i.e., CoStar and Real Capital Analytics), as well as the lease transactions (i.e., Compstak), we find that if a property's landlord is institutional, then on average 20.8% of that landlord's other properties are located in the

same MSA, compared to 14.1% if the property's landlord is not institutional. We also find that properties located within spatial clusters are more likely to be purchased by institutional investors. If the property is located within a geographical cluster of properties, the property's buyer is 5.9% more likely to be an institutional investor. The increasing institutional ownership leads to more geographically proximate properties owned by one or a few landlords, which we refer to as "ownership clustering."

As institutional landlords increase ownership clustering, the hold-up problem arising from the complementarity of geographically proximate properties within an area could in principle be alleviated. To formalize the hold-up problem, consider the following example. Suppose that due to operational need, a firm considers renting two sites in an area. Two sites are complementary – without the second site, the first site cannot run at full capacity. [3] The two sites are owned by two different landlords. After the firm leased the first site from landlord A and committed to pay the rent, landlord B can charge a higher rent for the second site than its regular rent. In other words, leasing the first site is a relationship-specific investment to landlord B, because the lease is more valuable within the relationship with him than outside it. As a result, landlord B can hold the firm up and extract surplus via charging a higher rent (Grossman and Hart, 1986; Hart and Moore, 1990; Buchanan and Yoon, 2000).

We document three facts that are consistent with the hold-up problem. Although it in principle arises as long as multiple sites within an area are complementary, we conjecture that the hold-up problem is more pronounced for large firms, which are more likely to operate multiple sites. First, we find that large firms indeed have a preference to rent adjacent properties, suggesting that adjacent properties within an area are complementary to each other in a large firm's industrial production. We find that the average observed distance between two properties of a large firm is approximately just 5.9 miles. This distance is smaller than the average distance between two otherwise similar properties, which is 15.7

[3] For instance, a retailer might rent several regional warehouses nearby to streamline distribution channels; an electronics company might rent a manufacturing plant to assemble products, along with a separate warehouse nearby to store finished goods; a pharmaceutical company could have its R&D laboratory close to its manufacturing plant which allows for rapid testing and quick scaling of production of new drugs.

miles. The complementarity of adjacent properties could potentially give rise to the hold-up problem. Second, we find that large firms experience higher rent in subsequent leases when they engage in sequential bargaining with multiple landlords. Third, we find that large firms tend to rent from large landlords, who own many sites. This avoids sequentially bargaining with multiple landlords and alleviates the hold-up problem.

As institutional landlords increase ownership clustering, that is, concentrate property ownership geographically, the hold-up problem should in principle be alleviated. Thus, the increasing institutional ownership in the industrial real estate market should decrease the rent for tenants on average. To test this hypothesis, we compile a comprehensive dataset on U.S. industrial real estate properties and lease transactions from 2001 to 2022. We use data on lease prices, tenants, landlords, and other contractual terms from 186,890 distinct industrial lease contracts. This data comes from CompStak, a proprietary platform in which commercial real estate brokers exchange information on executed leases. To accurately measure institutional ownership, we also link the leases to property-level data on ownership and landlord dynamics from CoStar and Real Capital Analytics (RCA), and reconcile the inconsistencies in these databases. Using this comprehensive dataset and fixed effect regressions, we find that institutional landlords indeed appear to charge rents that are 0.46–1.34 dollars per square foot per month lower on average compared to non-institutional landlords.

We show that the fact that institutional landlords appear to charge lower rents is driven by the fact that ownership clustering reduces the rent of large tenants. Specifically, we classify a tenant as large if it hires more than 150 employees, which is the 75th percentile of the employment size distribution. If one landlord has at least five actively-leased properties in a county, then we label his properties in that county to form a *geographical cluster*. Using fixed effect regressions, we find that when a large tenant rents a property from an institutional landlord and the property is located in a geographical cluster, the rent is 0.79 – 0.85 dollar per square foot per month lower (7% of the average rent). Note that when a large tenant rents a property from an institutional landlord but the property is located among a

geographically dispersed set of properties, the rent is, however, not significantly different from that charged by non-institutional landlords. Alternative explanations, such as institutional landlords providing lower-quality services, are difficult to be consistent with these results. Our regression controls for a rich set of features on property quality and characteristics, as well as tenant and county-year fixed effects, and the results are also robust to different classifications of large tenants.

Besides, if complementary properties are subject to the hold-up problem, these properties will be under-utilized. The model of Buchanan and Yoon (2000) has this prediction. We find that properties owned by institutional landlords tend to have higher occupancy rates compared to otherwise similar properties. Specifically, using property-level cash flow and operating metrics data from Trepp, we find that properties owned by institutional landlords are 4.4% more likely to be fully occupied than properties owned by non-institutional landlords but are similar in features including property age, size, distance to market center, and quality, etc. This finding is consistent with institutional landlords mitigating the hold-up problem and increasing the utilization rate of industrial real estate properties.

We are interested in the effect of ownership clustering caused by institutional landlords on rent. A key endogeneity concern for the fixed effect regressions is that institutional ownership may affect rent through other channels. For example, properties owned by institutional landlords may be of lower quality; thus, the rent is lower, yet quality is not fully unobservable. To mitigate the endogeneity concern, we exploit three largest mergers occurred in three distinct periods. In these mergers, the acquirers are private equity funds and purchased all the properties from the targets with no selections, and in certain local areas, this increased ownership clustering. The increase in ownership clustering is plausibly exogenous to property quality and local market conditions.

We utilize difference-in-differences regressions to identify the effect of private equity mergers. We restrict the sample to lease contracts signed by large tenants. We classify a property as being treated if it is located in a county in which the acquirer purchases one or more

properties from the target in the merger. A property is classified into the control group if it is located in such a county but is owned neither by the target nor by the acquirer. We verify that rents in the treated and control groups were not significantly different during the six-month period before the merger. During the 18-month period after the merger, the rent of treated properties declined by roughly 4.2 dollars per square foot per month. This suggests that ownership clustering caused by institutional landlords indeed lowered the rent for large tenants.

The rest of the paper is organized as follows. In Section 2, we provide a literature review. In Section 3, we introduce the data on industrial real estate leases and properties used in our analysis. In Section 4, we document institutional landlords' investing patterns and their impact on rents, then we present evidence that institutional investors mitigate the hold-up problem that tenants face in the industrial real estate market. Section 5 concludes.

2. Literature Review

We contribute to the literature on the role of institutional investors in the real estate market. Austin (2022) and Gurun, Wu, Xiao and Xiao (2022) find that institutional ownership led to higher prices and rents of residential real estate and, meanwhile, increased neighborhood diversity and safety. Lambie-Hanson, Li and Slonkosky (2019) find that the increase in institutional ownership contributed to 9 percent of the increase in single-family residential property prices from 2007 to 2014. These papers studied the residential real estate market, and our focus is instead on the industrial real estate market. We find that the increasing institutional ownership *lowered* the rent of industrial real estate properties for large tenants. Related to us, Cvijanovic, Milcheva and Van de Minne (2021) find that higher institutional ownership is followed by more volatile commercial real estate prices.

The literature has shown that institutional landlords have different preferences for properties than other landlords. Ghent (2021) finds that delegated investors concentrate invest-

ments in cities with higher transaction turnover and prefer tenants that are publicly listed firms since the rent cash flow risk is similar to that of a corporate bond. Cvijanović, Milcheva and Van de Minne (2022) find that the probability that a large (small) seller will sell a property to a similar-sized buyer is higher, keeping all else equal. Compared to them, our new finding is that institutional investors have a preference for geographically clustered industrial real estate properties. This preference has new predictions on institutional landlords' impact on this market.

The literature has well studied the hold-up (hold-out) problem in real estate development and coined it as the "land assembly problem": land assembly projects are frequently delayed or blocked by holdout landowners attempting to capture a greater share of the gains from trade, leading to fragmented and inefficient land use. In general, attempts to assemble complementary goods or resources with fragmented ownership – providing multiple parties the right to exclude – are subject to the hold-out problem sometimes referred to as the "tragedy of the anticommons" (see Michelman (1967); Heller (1998); Buchanan and Yoon (2000); Parisi, Schulz and Depoorter (2005) and Grossman, Pincus, Shapiro and Yengin (2019)). The model of Buchanan and Yoon (2000) predicts that if a resource is subject to the tragedy of anticommons, the price of the resource will exceed the competitive price, and the resource will be under-utilized. Our contribution is to provide evidence that institutional landlords mitigate the hold-up problem in the industrial real estate market by geographically concentrating property ownership.

3. Data

Following the standard practice, we define industrial real estate properties as warehouses, distribution centers, logistics centers, manufacturing sites, and flex spaces.[4] Our analysis relies on two pieces of data on the U.S. industrial real estate market from 2001 to 2022.

[4]A fraction of 55.3% of all properties in our sample are warehouses. Another 16.3% and 15.4% of the properties are manufacturing facilities and distribution centers, respectively. A flex building is a hybrid industrial property designed to accommodate both light industrial use and office use.

The first piece of data is on the properties, which provides the property's location and characteristics, and tracks the identity of the landlord and the share of his ownership. The second piece of data is on individual leasing contracts, which provide information on tenant characteristics and leasing terms.

3.1. Data on properties

Our first piece of data is on the properties. We use the CoStar dataset to form the sample of properties that we study. CoStar provides comprehensive coverage of U.S. industrial real estate properties, including both transacted and non-transacted properties. It provides data on each property's street address, geographic coordinates, rentable building area, and the year built. The geographic information allows us to track the landlord's footprint of ownership.

To track the ownership changes of each property, we combine property transaction data from Real Capital Analytics (RCA) and CoStar. From this data, we observe each property transaction's time and the buyers and sellers involved. RCA is widely regarded as the industry benchmark for ownership information. It standardizes buyer and seller names, and devotes substantial resources to identifying the ultimate beneficial owner behind each transaction. It also classifies market participants by investor types, which enables us to distinguish between institutional and non-institutional landlords. [5]

One drawback of the RCA data is that it only covers properties that have historically sold for more than $2.5 million, excluding many smaller industrial properties. To address this drawback, we complement the RCA data with property transactions data available in the CoStar database. While the CoStar database covers a broader set of property transactions, the landlord names and many variables on the buyer and the seller are often noisy and inconsistently recorded. This issue is particularly severe for institutional investors.

We match the transactions across the RCA and the CoStar databases, utilizing the prop-

[5] Ghent (2021) provides a detailed discussion about the advantage of RCA data, and the detailed investor types therein.

erty's address, the transaction date, and the buyer's and the seller's names. The combined dataset allows us to extend RCA's standardized owner names and investor type classifications to the set of transactions recorded only in CoStar. Ultimately, the combined dataset allows us to track the ownership changes of as many properties as possible.

For a subset of properties that issued Commercial Mortgage-Backed Securities (CMBS) between 2001 and 2022, we get their property-level cash flows and operating metrics from the Trepp database. Trepp provides standardized financial reporting for securitized commercial properties, including detailed cash flow and debt service statistics. We match the Trepp data to the properties in our sample using the property's address, characteristics, and issuance identifiers.

3.2. Data on leases

Our second piece of data is on the leases of U.S. industrial properties signed between January 2001 and December 2022. The data comes from the CompStak, a crowdsourced commercial real estate (CRE) data and analytics platform where brokers exchange data on executed leases. It gathers hard-to-find lease and sales transaction details, such as actual rent, tenant names, square footage, and terms. It is the leading data source for leases of commercial real estate properties, widely used both in academia and by practitioners (Liu, Rosenthal and Strange, 2018; Gupta, Mittal and Van Nieuwerburgh, 2026; Rosenthal, Strange and Urrego, 2022; Brueckner and Rosenthal, 2025). [6] At the lease level, the data includes the lease's execution date, term, and type (e.g., new lease, extension, or expansion), and the size of the leased property. As for the property, the data includes the street address, the building class (A, B, or C), and the year it was built. As for the tenant, the data includes the tenant's name, the number of employees, and the ticker symbol if the tenant is publicly listed.

[6] Note that since the CompStak data relies on user contributions from participating brokers and appraisers, it is not a random sample of all the leases.

3.3. Matching the datasets

We link the lease-level data to the property-level data using a multi-step matching procedure. The goal of the matching procedure is to assign each lease to one or more properties, obtaining the property's characteristics and ownership histories. Since the address aggregation methods differ in the lease data from CompStak versus in the property data from CoStar, one lease contract could be related to multiple properties.

We first standardize the street addresses using the Google Maps API, which harmonizes street names and returns latitude and longitude coordinates when available, and then match each lease to a property based on the standardized street address and geographic coordinates. The second step is to deal with the cases in which the address information is incomplete or ambiguous. Here we filter and refine the potential matches using building characteristics, including rentable building area and year built. After the two steps, we successfully match approximately 82% of the lease contracts to at least one property, and our matched sample consists of 186,890 distinct industrial lease contracts.[7]

3.4. Institutional investors

We identify institutional investors using the investor-type classifications in the RCA database. The RCA database categorizes commercial real estate sellers and buyers by the organizational structure and the investment purpose. Institutional investors manage pooled capital for third-party beneficiaries with strict fiduciary targets, whereas private and owner-operator investors deploy proprietary or closely held funds with operational control as a primary goal. Institutional investors fall into the eight finer categories: banks, investment managers, private equity funds, pension funds, finance companies, insurance companies, sovereign wealth funds, and open-end funds. Note that we exclude real estate investment trusts (REITs) from our analysis, because they operate under special regulations and tax

[7]Among all the lease contracts, 86.3% are matched to one property, and 91.5% are matched to one or two properties. In the latter case, property characteristics are aggregated to the contract level using either equal weights or weights proportional to rentable building area.

regimes. They tend to hold assets for a long time and adjust the portfolios less frequently. Mühlhofer (2019) shows that the investment strategies of REITs are bound by the holding period constraint.

We show that institutional investors' ownership of U.S. industrial real estate properties has been growing rapidly from 2001 to 2022. Our combined dataset on properties allows us to track the ownership changes of as many U.S. industrial real estate properties as possible. Figure 1 plots the ownership share of institutional investors using our data. The growth is significant: institutional investors owned roughly 5–6% of all the properties in the early 2000s, and owned more than 12% by 2022. The growth accelerates after 2015, following the rise of e-commerce and logistics demand, and the influx of institutional capital into the industrial real estate market.

As we decompose the aggregate growth in institutional ownership, we find that the growth is mainly driven by the ownership of investment managers and private equity funds. These investors adopt more active investment strategies compared to other institutional investors such as pension funds, insurance companies, etc. In Figure 1 Panel B, we plot the trend in ownership shares by the type of institutional investor. Investment managers have the largest ownership share and experience a steady growth in the ownership share from 2001 to 2022. The ownership share of private equity funds grew rapidly from the mid-2000s, dropped temporarily around 2015, and grew rapidly again from 2016. In comparison, the ownership shares of other institutional investors, such as pension funds, insurance companies, etc., remain relatively small and stable.

We find that the growth in institutional investors' ownership is mainly a result of purchases from smaller, less active owners during the period that we study. It is mainly not caused by the transactions among large institutional investors and large non-institutional investors. Following Ghent (2021), we label investors who make five or fewer purchases over the entire sample period as "small investors." Small investors account for approximately 20% of transactions. Figure 2 plots the shares of transactions that involve each type of investor

in the aggregate. The figure shows that institutional investors are much more likely to be buyers than sellers, while small investors and owner-operator investors are much more likely to be sellers rather than buyers.

3.5. Summary statistics

Table 1 provides summary statistics for the main variables used in our analysis. The sample for our main analysis is a matched dataset combining information on lease contracts and properties.

We measure the rental cost of a property using the net effective rent (NER) of a lease. The NER is a standard pricing measure in the commercial real estate industry. It combines the nominal monthly rent in the lease's rent schedule, with rent concessions such as free-rent periods and landlord-provided tenant improvements. The calculation of the NER converts all cash and in-kind transfers into a common monthly rent equivalent. Thus, the NER reflects the effective rental cost of a property. Gupta et al. (2026) also use the NER in their analysis. The average net effective rent of properties in our sample is \$11.26 per square foot per month, and the median is \$8.49 per square foot per month. The mean leased area in our sample is about 38,300 square feet, and the median is roughly 11,900 square feet.

In approximately 21% of the leases in our sample, the landlord is an institutional investor. As for the tenants, we classify tenants based on their demand for properties within a local market. A tenant is classified as a "large tenant" if his average leased area size in a county exceeds the 75th percentile among all tenants. By this definition, a large tenant occupies the largest area of industrial properties in a county. We hypothesize that to such a tenant, being able to cluster their properties geographically would reduce the coordination and monitoring cost the most. In 22.6% of the leases, the tenants are "large tenants".

We report the summary statistics of the property-level cash flows and operating metrics variables sourced from the Trepp database in Table A.2. We also provide a detailed variable description for all the variables we use for analysis in Table A.1.

4. Empirical results

We present our empirical results in this section. First, we show that institutional investors tend to hold geographically concentrated properties; however, they charge lower rents on average. We hypothesize that this fact is mainly driven by institutional investors charging lower rent to large tenants and find evidence for the hypothesis. Second, we show evidence supporting the existence of the hold-up problem in the industrial real estate rental market. Third, we show evidence that suggests the institutional landlords, via their geographically concentrated ownership, have mitigated the hold-up problem. This might be the reason why we observe that large tenants' rental costs declined. Finally, we utilize the mergers of institutional investors as plausibly exogenous shocks to provide sharper evidence for the channel, and discuss robustness checks and alternative channels.

4.1. Institutional investors' holdings and the rents they charge

For an institutional investor, their investment strategy involves a tradeoff: holding properties at dispersed locations may have a diversification benefit, while holding nearby properties can reduce the monitoring cost. Hartzell et al. (2014); Feng et al. (2021) show that geographical diversification of the properties portfolio affects the value of real estate investment trusts (REITs). Since REITs do not drive the recent growth in institutional ownership and face special regulations, our analysis focuses on institutional investors apart from REITs. The ultimate outcome of this tradeoff for these investors remains unclear.

We show that institutional investors are more likely to hold properties that are geographically close ("clustered"). In Panel B of Table 1, we use several measures of "geographical closeness" of properties to show that institutional investors are more likely to hold clustered properties than non-institutional landlords. We introduce a label, a "major local landlord," to denote a landlord who holds more than or equal to five properties within a city, a county, or an MSA, in a given year. The idea is that, industrial properties located within such

a geographic area can be considered as close for the purpose of industrial productions or logistics.[8] A major local landlord of industrial properties, in effect, holds properties that are clustered from the perspective of industrial purposes. Note that we do not use the average distance between two properties to measure the geographical closeness of a landlord's properties because the average distance can be a poor measure of geographical concentration. Consider the following two scenarios. Landlord A owns two properties that are 5 km away from each other in a city. Landlord B owns ten properties that are 5 km away from each other in the same city. According to the average distance, landlords A and B hold equally geographically concentrated properties, but obviously landlord B has more presence in the city and owns a tight cluster that consists of more properties.

First, we show that an institutional investor is more likely to be a major local landlord, compared to a non-institutional landlord. In a given year, the probability that an institutional investor is a major local landlord within a geographic area is roughly 24%–34%. In contrast, this probability is only 7%-9.5% for a non-institutional investor. [9]

Second, we show that at the extensive margin, an institutional investor is a major local landlord in more areas, compared to a non-institutional investor, regardless of whether an area is a city, a county, or an MSA. For example, an institutional investor is, on average, a major local landlord in 0.373 city, while a non-institutional is a major landlord in 0.089 city.

Third, we show that, an institutional investor has a larger share of his properties being located in the area where he is a major local landlord. This is true regardless of whether the share of properties is in terms of the number of properties or the area size of the properties. Finally, we show that on average, if a landlord is institutional, then for each of his property,

[8]For example, last-mile facilities within 20-50 miles of the largest customer clusters enable same-day/next-day shipping and cut fuel costs. Facilities 20-30 miles from major ports can cut drayage costs by 30-50%. See Warehouse Location Strategy: Choose the Optimal U.S. Facility (2026 Guide).

[9]The analysis is based on a sample of 502,738 landlords in the CoStar data. We restrict the sample to landlords who hold properties in more than one MSA and own no more than 66 properties, the 99th percentile of owner portfolio size. The former restriction excludes highly localized owners—often operating on a single street and frequently recorded as single-purpose entities in the data, since they are not directly comparable to institutional investors that operate across geographic areas. The latter restriction excludes a few investors who hold a massive number of properties.

a fraction of 12.6%–20.7% of his other properties are located in the same area, while this fraction is just 9.7%–13.9% for a non-institutional landlord. We also show that among landlords whose total area size of properties is small to medium, institutional landlords are much more likely than non-institutional landlords to hold clustered properties, but among the very large landlords, the difference between institutional and non-institutional landlords is not significant. This result is relegated to Appendix Table A.3.

In fact, from 2001 to 2022, major local landlords in the U.S. are increasingly more likely to be institutional investors. In Figure 3, we plot the share of major local landlords, those owning at least five properties within an area, that are institutional investors over time. In 2001–2002, a share of 10% of the major local landlords are institutional investors, and by 2021–2022 this number has risen to around 14%. Similarly, in 2001–2002, roughly 12.5% of the properties owned by major local landlords are held by institutional investors, and by 2021–2022, this number has risen to close to 18%.

We find that the cluster of properties that institutional investors hold is usually located close to primary logistics and distribution corridors. In Figure 4, we overlay the location of the clusters of properties during 2017–2022 on a map of the U.S. We see that major local landlords mainly own properties in counties near major interstate highways, such as the DuPage County and Will County in Illinois (near I80/90 highway), Tarrant County in Texas (near I-35 highway), and San Bernardino County in California (near I-10 highway). In Dupage County and Will County, more than 40% of the major local landlords are institutional investors. In other counties near interstate highways, institutional investors also account for 10-30% of the major local landlords. In Appendix Table A.4, we report the distance in miles between property clusters and the major highways. In sum, institutional investors appear to invest heavily in properties that are most valuable for industrial productions and the distribution networks.

All else equal, concentrated ownership within an area would lead to higher market power for institutional landlords, allowing them to charge higher rental prices. Austin (2022),

Gurun et al. (2022) and Lambie-Hanson et al. (2019) have found that institutional ownership increased the prices and rents of residential properties, consistent with the insight that institutional investors have concentrated ownership and thus have higher market power.

In contrast to this conventional insight, we find that institutional landlords actually charge *lower* rents. We find that institutional landlords charge rents that are 0.46–1.45 dollars per square foot per month lower than non-institutional landlords, that is, 4%–13% of the average rent in our sample. This result is robust to a wide range of regression specifications that control for property characteristics and market conditions, as well as county-by-time fixed effects, and tenant fixed effects. Table 2 reports the regression results. In Section 4.4, we also provide sharper evidence on how a plausibly exogenous increase in ownership concentration caused by mergers of institutional investors affects the rents. To explain this seemingly puzzling fact, we propose and test a novel channel in the remainder of the paper: institutional ownership mitigates the hold-up problem that tenants face when renting complementary industrial properties.

4.2. Evidence on the hold-up problem

Hold-up problems naturally exist in the industrial rental market. When a firm rents a site, the productivity of this site often depends on whether the firm can rent other complementary sites. As a result, after one site has been rented, the landlord of complementary sites can hold the firm up by asking for a higher rent. The literature has well studied the hold-up (hold-out) problem in real estate development and coined it as the "land assembly problem": land assembly projects are frequently delayed or blocked by holdout landowners attempting to capture a greater share of the gains from trade, leading to fragmented and inefficient land use. In general, attempts to assemble complementary goods or resources with fragmented ownership – providing multiple parties the right to exclude – are subject to the hold-out problem sometimes referred to as the "tragedy of the anticommons" (see Michelman (1967); Heller (1998); Buchanan and Yoon (2000); Parisi et al. (2005) and Grossman et al. (2019)).

The model of Buchanan and Yoon (2000) predicts that if a resource is subject to the tragedy of anticommons, the price of the resource will exceed the competitive price, and the resource will be under-utilized.

Within a given area, sites located close to each other are often complementary in industrial production. For example, a retailer might lease multiple regional warehouses nearby to optimize distribution channels; an electronics company could operate a manufacturing plant for assembly alongside a neighboring warehouse to store finished goods; and a pharmaceutical firm might position its R&D laboratory close to its manufacturing facility to facilitate rapid testing and rapid scaling of new drug production. In these examples, sites located 10 to 20 miles apart can be considered close enough for industrial purposes, as they are typically accessible in a short time by car.

To show evidence for the hold-up problem, we focus on the large tenants. Although the problem arises as long as multiple sites within an area are complementary, we conjecture that it is more pronounced for large tenants that are more likely to operate multiple sites. Large tenants usually occupy multiple sites within an area that are tightly linked to form logistics networks, improve supply chain efficiency, and reduce operational costs. We identify large tenants according to their demand for properties within a local area. A tenant is denoted a "large tenant" if his average leased area size in a county exceeds the 75th percentile among all tenants. [10]

We provide three pieces of evidence that are supportive of the existence of the hold-up problem. First, we show that large tenants prefer renting geographically close properties. Second, we show that the hold-up problem shows up in rental prices: large tenants face higher rents when negotiating leases with multiple independent landlords. Third, large tenants are more likely to rent from large (or institutional) landlords, since negotiating with a few large landlords who own multiple properties is less subject to the hold-up problem than negotiating

[10] Our results are robust to alternative definitions of the large tenant. The alternative definitions include tenants whose leased area size in a county is in the top tercile among all tenants, and tenants who have more than 150 employees (top quartile of the employment size). See Appendix Tables A.6–A.8.

with many small landlords whose holdings are dispersed. In other words, large tenants sort into large (or institutional) landlords.

As the first piece of evidence, we show that large tenants prefer renting geographically close properties. We compare the average distance among the properties occupied by a large tenant, versus the average distance among a counterfactual set of properties randomly chosen from the active leases within the same county and same month. We call the latter the "benchmark distance." In particular, let K_i be the number of active contracts held by tenant i in a county and a month. We compute the *actual distance* as the mean pairwise distance among the properties underlying these contracts. To calculate the *benchmark distance*, we create a set of K_i contracts by randomly sampling from the pool of all active contracts in the same county and same month without replacement, and compute the mean pairwise distance among the properties drawn. We repeat the sampling 500 times, and the average pairwise distance among the repetitions is the benchmark distance. [11]

We report the comparison between the actual distance and the benchmark distance of large tenants' occupied properties in Panel A of Table 3. For example, for a tenant who occupies two properties, the average distance among his properties is approximately 5.89 miles, whereas the benchmark distance for him is 15.7 miles, which is much larger. The fact that the benchmark distance is much larger persists regardless of the number of properties that the tenant occupies. We also perform a t-test of the difference between the observed distance and the benchmark distance, suggesting that the difference is statistically significantly negative at the 1% confidence level. Moreover, the frequency at which the actual distance being smaller than the benchmark distance exceeds 80%. Taken together, the evidence suggests that large tenants appear to have a preference for geographically close properties.

As the second piece of evidence, we show that large tenants face higher rents when negotiating leases with multiple independent landlords. Specifically, we show that when

[11] We impose a market-thickness condition, requiring that the total number of active contracts in the same county and same month be twice as many as K_i. This condition is to avoid drawing from thin markets where tenant i's contracts account for the majority of the contracts, such that the benchmark distance is nearly identical as the actual distance.

a tenant rents multiple complementary sites sequentially from several landlords, sites that are rented later in the sequence tend to have higher rental costs. We define an indicator variable, Sequential$^{(h)}$, which equals one if the tenant had entered into an industrial lease within the same county within the past h months ($h = 3, 6, 9, 12, 15, 18$), and zero otherwise. We examine how the rental price is related to Sequential$^{(h)}$, controlling for property size, other lease terms, and county-by-tenant fixed effects. Our specifications are comparing the leases signed by the same tenant within the same county.

Panel B of Table 3 reports the findings. The coefficient on Sequential$^{(h)}$ is positive across all choices of the horizon h. As for the economic meaning, a tenant pays 0.18–0.42 dollars per square foot per month more, for properties that rented later in a sequence. So far this test does not suggest that the rent is higher when a tenant negotiates with multiple independent landlords compared to negotiating with a single landlord. We find that this is indeed the case in a robustness test, and relegate the results to Appendix Table A.5. In sum, the evidence suggests that the rental cost is higher in sequential bargaining with multiple landlords, consistent with the existence of the hold-up problem.

As the third piece of evidence, we show that large tenants sort into large (or institutional) landlords. Since negotiating with multiple landlords exposes a large tenant to potential hold-up problems, negotiating with a few large landlords who each own a large set of properties is more efficient. We examine whether a large tenant's counterparty is more likely to be an institutional landlord. In particular, we use the pool of all the lease contracts, and regress a dummy variable indicating whether the tenant is a large tenant against a dummy variable indicating whether the landlord is an institutional investor, controlling for characteristics of the property and county-by-year-month fixed effects. Note that we specifically control for the quality of the property, to rule out the possibility that the sorting is because institutional landlords provide higher-quality properties than other landlords. We report the regression results in Table 4 that suggest the existence of the sorting phenomenon.

4.3. Institutional investors mitigate the hold-up problem

We now show that the negative relationship between institutional ownership and rental cost (see Section 4.1) is consistent with the fact that institutional investors mitigate the hold-up problem in the industrial real estate market. We proceed in two steps. First, we show that the negative relationship between institutional ownership and rental cost is mainly driven by the large tenants. Second, we show that large tenants receive lower rent from institutional landlords only for the properties that lie in a geographical cluster of properties.

First, we show that the negative relationship between institutional ownership and rental cost is largely driven by the large tenants. We use a subsample of lease contracts that involve only large tenants, and regress the rent in a lease against a dummy indicating whether the owner is an institutional investor, property characteristics, other lease terms, tenant fixed effects, and county-by-time fixed effects. Table 5 reports the regression results. The estimates suggest that large tenants' rents are 0.54–0.97 dollars per square foot per month lower when leasing from institutional investors compared with other landlords.

Second, we show that large tenants receive lower rent from institutional landlords only for the properties that lie in a geographical cluster of properties. Regarding the definition, if one landlord has at least five actively-leased properties in a county, then we label his properties in that county to form a *geographical cluster*. We regress the rent in a lease against a dummy indicating whether the owner is an institutional investor (INST), and in addition, an interaction term between the institutional landlord dummy and a dummy suggesting whether the property belongs to a cluster of properties (INST $\times$ Cluster). Table 6 reports the regression results. We find that the coefficient in front of the interaction term is negative and statistically significant, whereas the coefficient in front of the institutional investor dummy (INST) is no longer statistically significant. Our interpretation of this finding is that institutional landlords mitigate the hold-up problem that the large tenant would otherwise encounter when they want to rent from a cluster of properties.

The model of Buchanan and Yoon (2000) predicts that the hold-up problem will make

properties under-utilized. If institutional landlords indeed mitigate the hold-up problem, we expect to find that their properties are more efficiently utilized. To test this prediction, we compare the property-level cash flow and operating outcomes of institutional and non-institutional landlords using data from the Trepp database. Appendix Table A.13 reports the results. Properties owned by institutional investors are 4.4% more likely to be fully occupied, controlling for property characteristics and local market conditions. These properties also have lower operating expenditures, higher net operating income, and lower debt service payments.

4.4. Identification: Institutional investors lowered rents to large tenants

A key omitted variable that could confound the relationship between institutional ownership and rent is that institutional investors do not enter local markets randomly. Their entry decisions may reflect superior information or expectations about future local economic conditions. In this case, the observed effect on rent may capture unobserved local demand shocks rather than the effect of institutional ownership itself.

To isolate the effect of institutional ownership from the confounding factors, we exploit three large-scale mergers of institutional investors in the industrial real estate market. Table 7 reports the details of the three mergers and our designation of the treated and control groups. A merger-affected county is defined as a county where the acquirer purchased one or more properties from the target firm. A treated property is defined as a property in a merger-affected county that is owned by the acquirer or purchased from the target. These properties are locally affected by the merger. And the control properties are defined as those in the merger-affected county yet owned neither by the acquirer nor the target. Our identification strategy is similar to that of Gurun et al. (2022), who exploit mergers of institutional investors in the single-family-residential rental market to identify the effect of institutional ownership. Our estimates should be interpreted as the treatment effect on the treated (Gurun et al., 2022).

Several features about the mergers help sharpen our identification. First, the three mergers occurred at distinct, non-overlapping times. This mitigates the concern of comparing newly-treated properties against already-treated properties, which as illustrated by Callaway and Sant'Anna (2021) among others, can lead to biased estimates. Second, in these mergers, acquirers purchased either all or nearly all the properties owned by the target. The properties acquired are often a large set of properties located in multiple states. There is limited evidence that the acquirers select the individual properties to be purchased. Third, our treated properties and control properties are both located in the same county at the same time, so local demand shocks as well as beliefs about the local market's growth are differenced out.

Our regression specifications are as follows.

$$Rent_{ijt} = \alpha_0 + \alpha_1 Treat_{ijt} \times Post_t + \alpha_2 Treat_{ijt} + \beta X_{ijt} + \theta_i + \gamma_{j,t} + \epsilon_{ijt}. \tag{1}$$

In the equation, $Rent_{ijt}$ is the rent charged in the lease contract i in the county j and at time t. As for the variable $Treat_{ijt}$, we consider two variables that capture both the extensive and the intensive margin of the exposure to the merger, similar to Gurun et al. (2022). The first variable is a dummy variable that equals one if the property i is located in a merger-affected county and is owned by the acquirer or purchased from the target. The second variable is $\ln(\Delta Properties+1)$, a continuous variable that reflects the number of properties in a given county that the acquirer gained from the merger (conveniently denoted as $\Delta Properties$ here), which captures the extent of the increase in the acquirer's local footprint.

We control for observable attributes about the properties and the lease as much as possible. The set of control variables X_{ijt} includes the property's size, age, distance to the city center, and quality, as well as the lease contract's maturity. As for the property's quality, we use the building class information from the Compstak dataset to approximate the building quality. Class A is the highest, Class B is medium, and Class C is the lowest. These factors

are all known to affect rental rates directly. Additionally, we include property fixed effects (θ_i) to absorb time-invariant property characteristics, and county $\times$ year-month fixed effects ($\gamma_{j,t}$) to control for the unobserved, time-varying factors at the county level, such as local demand shocks.

Table 8 reports the difference-in-differences estimates of the effect of merger-induced institutional ownership increases on rents. The sample is restricted to leases signed by large tenants. Across all specifications, the coefficient on $Treat \times Post$ is negative and statistically significant. The estimates suggest that rents of treated properties decline by 2.26–2.34 dollars per square foot per month relative to control properties in the same county, roughly 20% of the average net effective rent in our sample. The results are robust regardless of whether we use the discrete or continuous $Treat_{ijt}$ variable.

We validate the parallel trend assumption for the difference-in-differences estimation. Specifically, we estimate the dynamic effect of the mergers by replacing the *Post* dummy in equation (1) with a set of time dummies defined relative to the merger completion date. Here we let each time dummy represent a period of six months, because adjustments in the contract terms should occur gradually after the merger completes. Gurun et al. (2022) also find that in the residential market, the effect of mergers on rents builds up gradually after completion. Table 9 reports the estimated coefficients, and Figure 5 plots these coefficients, together with the 95% confidence intervals.

The effect of the mergers on rents is small in magnitude and statistically insignificant across all specifications, suggesting that there are no diverging pre-trends between the treated and control properties before the merger. The effect of the mergers on rents becomes negative and statistically significant right after the merger completions. The rents of treated properties decline by 1.89 dollars per square foot per month in the first six months after completion, and the decline enlarges to 2.95 dollars in another six months and remains economically large at 1.90 dollars six months later.

4.5. Robustness checks and alternative explanations

Alternative definitions of large tenants. Note that we identify a tenant as a "large tenant" if his average leased area size in a county exceeds the 75th percentile among all tenants. One robustness check we perform is to use two alternative definitions of the "large tenant". One alternative definition that we consider is to classify tenants whose leased area size in a county is in the top tercile among all tenants as large tenants. The other alternative definition that we consider is to classify tenants who have more than 150 employees (top quartile of the employment size) as large tenants.

We provided three pieces of evidence that are supportive of the existence of the hold-up problem. First, large tenants prefer renting geographically close properties. Second, large tenants face higher rents when negotiating leases with multiple independent landlords. Third, large tenants are more likely to rent from institutional landlords. These three pieces of evidence are valid under alternative definitions of large tenants. See Appendix Tables A.6–A.8 for the results of the corresponding robustness check.

We provided two pieces of evidence that suggest institutional investors mitigate the hold-up problem. First, the negative relationship between institutional ownership and rental cost is mainly driven by the large tenants. Second, large tenants receive lower rent from institutional landlords only for the properties that lie in a geographical cluster of properties. These results are still valid under alternative definitions of large tenants. See Appendix Table A.7 and A.8 for the results of the corresponding robustness check.

We use difference-in-differences regressions to show that merger-induced institutional ownership increases reduced rents of large tenants. This result is valid under alternative definitions of large tenants. See Appendix Tables A.11–A.12 for the results of the corresponding robustness check.

Information channel. One alternative explanation for the fact that institutional landlords charge lower rents to large tenants is an information channel. Compared to small

tenants, large tenants may have more stable operations and stay active in a local area for a long period of time. Institutional landlords may have a long relationship with large tenants, and thus know their quality and stability better. This makes the institutional landlord charge lower rent in exchange for the quality and stability of the tenant.

We show that this channel is unlikely to drive our result. Specifically, we measure the length of the relationship between the landlord and the tenant, defined as the number of months since the landlord first signed a contract ever with the tenant in any local area. If the informational channel is valid, the relationship length should proxy for the "good signal" about quality and stability. We explicitly control for the relationship length when examining the relationship between institutional ownership and rents. Appendix Table A.9 presents the results. The finding that institutional landlords offer lower rents to large tenants, only when the tenant rents from a cluster of the landlord's properties, is still valid. The information channel is unlikely to drive our findings.

Co-ownership channel. Another alternative explanation for the fact that institutional landlords charge lower rents to large tenants is the co-ownership channel. Specifically, if an institutional landlord is a shareholder of the tenant, then he may charge lower rent to the tenant as a way to provide a subsidy. To mitigate this concern, from all the available 13F filings in the LSEG/Thomson Reuters Institutional Holdings datasets, we identify all the landlords that are 13F investors and all the tenants whose shares belong to the landlord's investment portfolios. We then conduct a robustness check that excludes from our analysis all the leases in which the tenant's shares belong to the landlord's investment portfolios. Appendix Table A.10 reports the results after this exclusion. The finding that institutional landlords offer lower rents to large tenants, only when the tenant rents from a cluster of the landlord's properties, is still valid. The co-ownership channel is unlikely to drive our findings.

5. Conclusion

U.S. firms incur substantial expenditures on industrial real estate. Making the industrial real estate properties accessible could be helpful to the revitalization of U.S. industrial production. We find that the rapid growth of institutional ownership in the U.S. industrial real estate market from 2001 to 2022, although increasing local ownership concentration, lowered the rental cost of industrial real estate properties. This result is robust to controlling for granular property characteristics, and to using mergers of institutional investors as plausibly exogenous shocks that increased institutional ownership in a local area.

The conventional insight suggests that institutional investors tend to have concentrated ownership in a local area, consequently have higher market power and would charge higher rental prices. The conventional insight struggles to explain this empirical finding. We propose and find evidence for a novel channel that has the potential to explain the finding: institutional ownership mitigates the hold-up problem that tenants face when renting complementary industrial properties.

It is well studied in the literature that attempts to assemble complementary goods or resources with fragmented ownership – providing multiple parties the right to exclude – are subject to the hold-up (hold-out) problem sometimes referred to as the "tragedy of the anticommons". We are the first to provide evidence that institutional ownership, via unifying the fragmented ownership, can mitigate the hold-up problem and improve the efficiency of the industrial real estate market. This channel reduces the rent of large tenants that are in the most need of complementary properties. What is not yet studied is how institutional ownership affects the rental cost of small tenants, and the impact of changes in rental cost on the tenant's operations and the local economy. This is left for future study.

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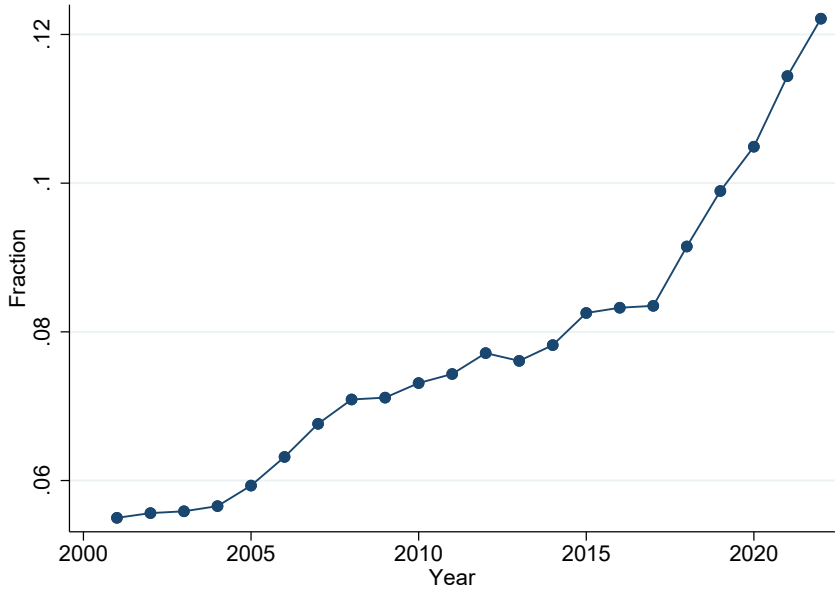
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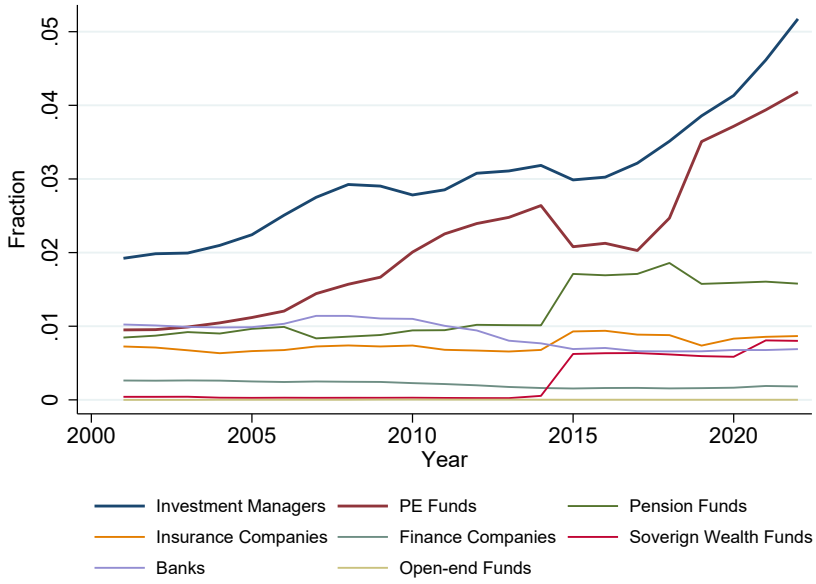
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Fig. 1. The growing share of U.S. industrial real estate properties owned by institutional investors, 2001–2022

Panel A: Share of properties owned by institutional investors



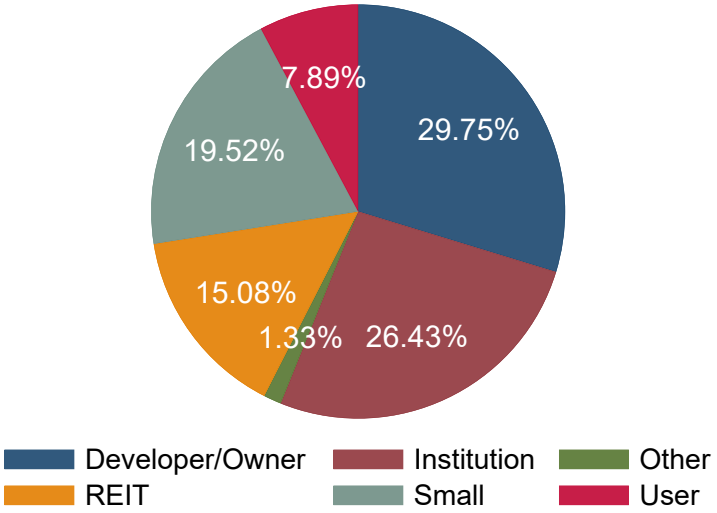
Panel B: Share of properties owned by each category of institutional investors



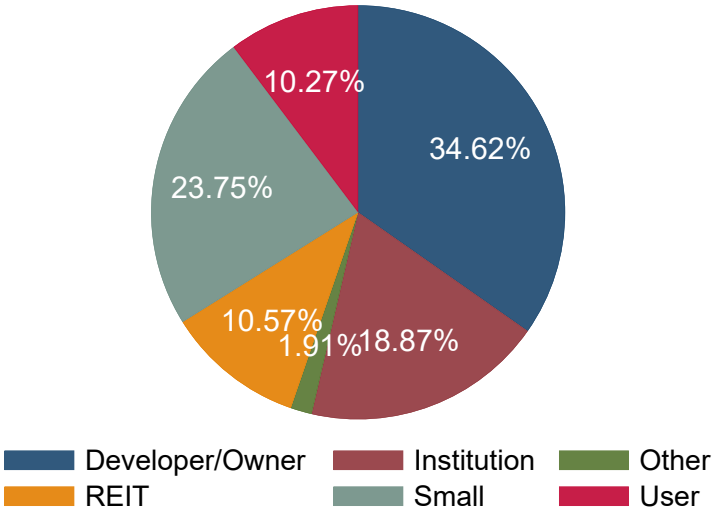
Notes: Panel A plots the share of all U.S. industrial real estate properties, in terms of the rentable building area, owned by institutional investors from 2001 to 2022. Panel B plots the shares owned by each category of institutional investors from 2001 to 2022.

Fig. 2. Investor composition in the U.S. industrial real estate market, 2001–2022

Panel A: Buyer composition

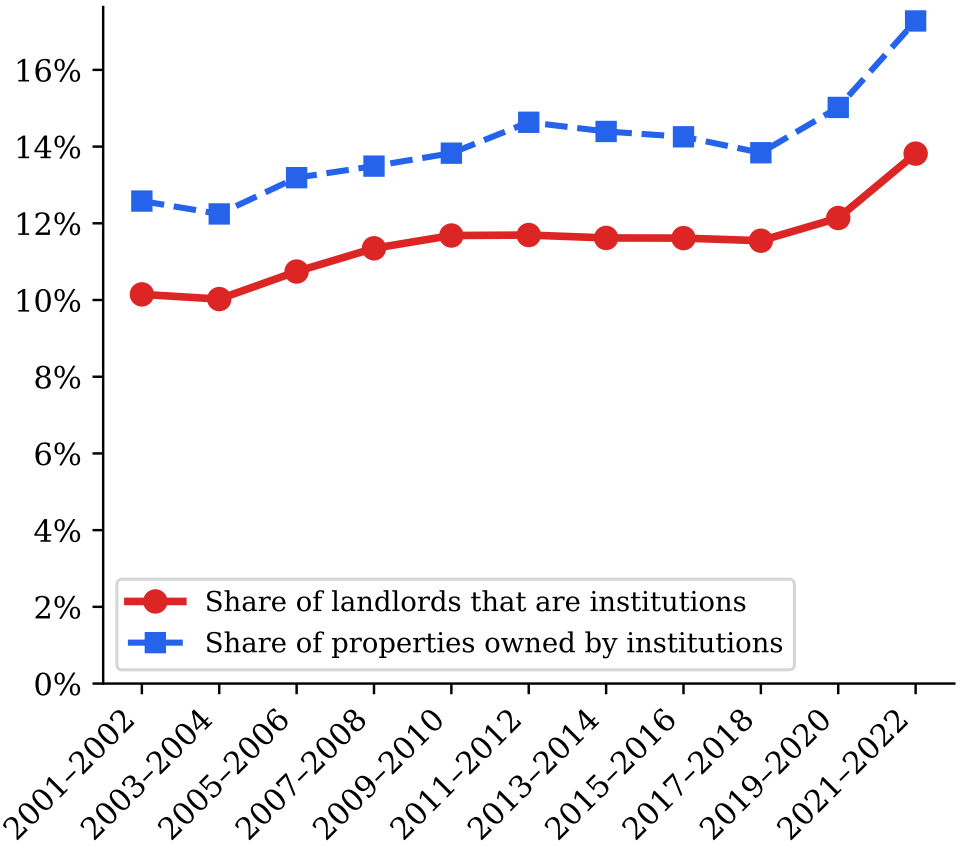


Panel B: Seller composition



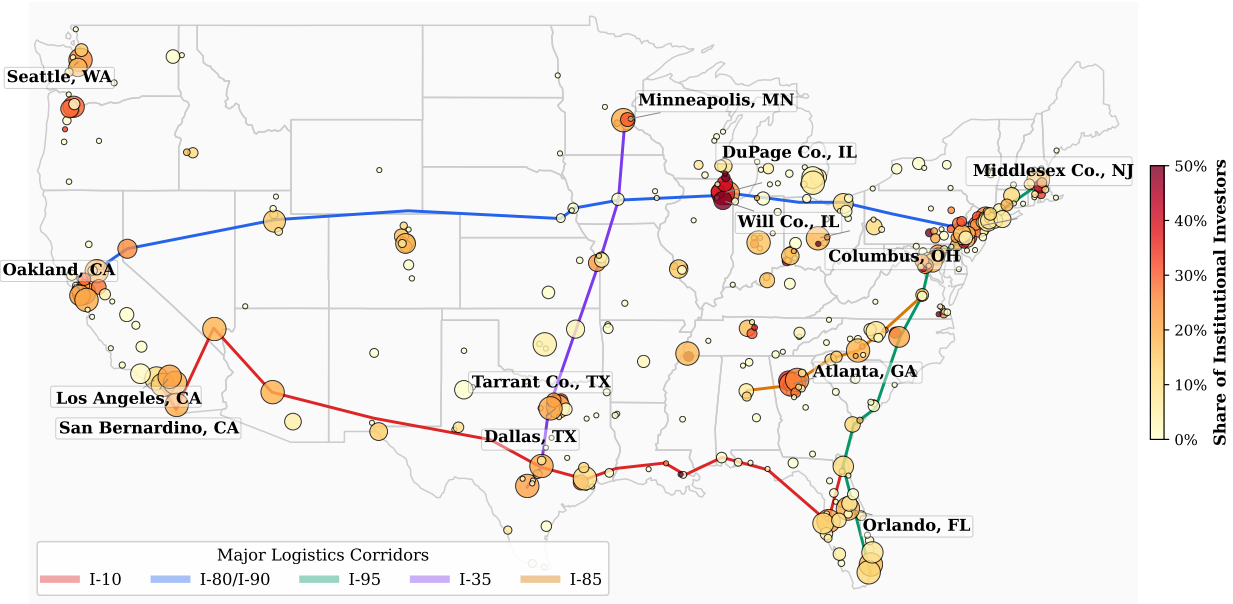
Notes: The two panels plot the shares of the total transactions, in terms of the transaction value, that involve each category of investors as buyers and sellers, among all transactions of U.S. industrial real estate properties from 2001 to 2022. Institutional investors include banks, investment managers, private equity funds, pension funds, finance companies, insurance companies, sovereign wealth funds, and open-end funds. REITs include both public and private REITs. User include corporations, government, and non-profit users. Small investors are investors that in total make fewer than five transactions over the full sample period.

Fig. 3. Institutional investors are a growing share of major local landlords



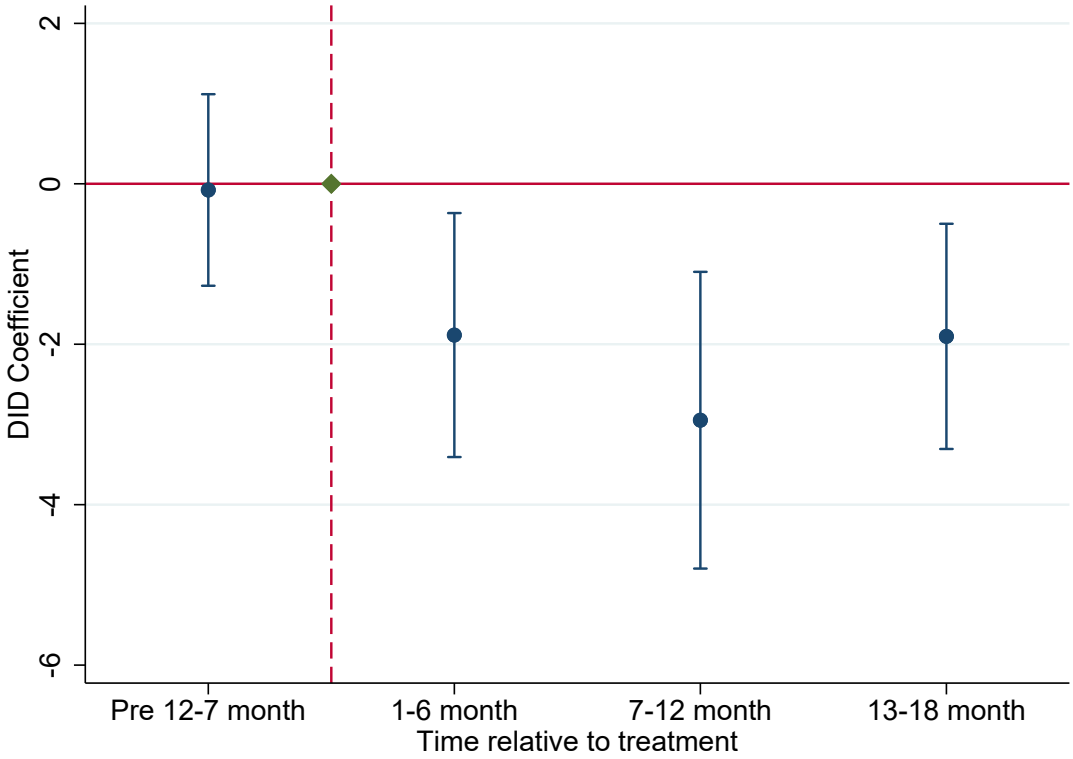
Notes: We label a landlord as a major local landlord if he owns more than five properties in a county. The solid line plots the number of major local landlords that are institutional investors as a fraction of the total number of major local landlords in U.S. The dashed line plots the number of properties held by the major local landlords that are institutional investors as a fraction of the total number of properties owned by major local landlords. Institutional investors include banks, investment managers, private equity funds, pension funds, finance companies, insurance companies, sovereign wealth funds, and open-end funds.

Fig. 4. Geographical distribution of major local landlords



Notes: We label a landlord as a major local landlord if he owns more than five properties in a county. Each bubble represents a county, with the bubble size proportional to the properties of the county owned by major local landlords. Counties with fewer than three major local landlords are not drawn. A darker color of the bubble indicates that the share of institutional investors among all major local landlords of the county is larger, with a scale bar translating the color to the percentage of institutional investor's share positioned on the right. Solid lines represent the major U.S. interstate highways serving as logistics corridors.

Fig. 5. Dynamic treatment effect of the merger of institutional investors



Notes: This figure plots the coefficients from difference-in-differences regressions and the 95 percent confidence intervals, showing the treatment effect of the merger of institutional investors. The coefficients are from Table 9 Column 2. We define a merger-affected county as a county where the acquirer purchased one or more properties from the target firm. A treated property is defined as a property in a merger-affected county that is owned by the acquirer or purchased from the target. These properties are locally affected by the merger. And the control properties are defined as those in the merger-affected county yet owned neither by the acquirer nor the target. The x-axis reports the time relative to the merger, and the vertical dashed line represents the time of the merger.

Table 1
Summary Statistics

Panel A: Variables on Lease Contracts

	Obs.	Mean	Median	Std. dev.	P25.	P75.
Rent	182,859	11.255	8.490	10.784	5.710	12.770
Age (years)	186,016	31.669	30	19.938	18	41
Lease Term (months)	183,256	53.426	56	33.656	36	62
Size (sqft)	186,890	38299.320	11921	85233.670	4370	34337
Quality A	186,890	0.193	0	0.394	0	0
Quality B	186,890	0.548	1	0.498	0	1
Quality C	186,890	0.229	0	0.420	0	0
Large Tenant	186,890	0.226	0	0.418	0	0
Dist. to Center (km)	186,844	18.338	15.723	13.452	8.811	24.382
INST	186,890	0.210	0	0.407	0	0
#Props in Same County	186,890	11.865	2	24.212	1	10

Panel B: Institutional Landlords Tend to Hold Geographically Clustered Properties

	INST	Others	Diff. (INST − Others)	SE	p-value
Panel B.1: Nation-wide and local ownership of properties					
# Properties (nation-wide)	11.852	4.656	7.196	0.120	< 0.001
RBA (nation-wide, million sqft)	1.135	0.324	0.811	0.019	< 0.001
# Properties (MSA-level)	5.137	2.910	2.227	0.044	< 0.001
# Properties (county-level)	5.976	3.090	2.886	0.054	< 0.001
# Properties (city-level)	7.027	3.327	3.700	0.067	< 0.001
Panel B.2: Probability of being a major local landlord					
MSA-level	0.339	0.095	0.244	0.004	< 0.001
County-level	0.288	0.083	0.205	0.004	< 0.001
City-level	0.236	0.068	0.168	0.004	< 0.001
Panel B.3: The number of areas in which the investor is a major local landlord					
MSA-level	0.547	0.117	0.430	0.009	< 0.001
County-level	0.468	0.106	0.362	0.008	< 0.001
City-level	0.373	0.089	0.284	0.007	< 0.001
Panel B.4: Share of the investor's properties located in areas in which he is a major landlord					
MSA-level	0.221	0.070	0.150	0.003	< 0.001
County-level	0.174	0.059	0.115	0.003	< 0.001
City-level	0.126	0.044	0.082	0.002	< 0.001
Panel B.5: Share of the investor's rentable building area located in areas in which he is a major landlord					
MSA-level	0.194	0.065	0.129	0.003	< 0.001

(continued) Summary Statistics

County-level	0.145	0.054	0.091	0.002	< 0.001
City-level	0.100	0.039	0.061	0.002	< 0.001
Panel B.6: The extent of ownership clustering					
MSA-level	0.207	0.139	0.068	0.002	< 0.001
County-level	0.167	0.121	0.046	0.002	< 0.001
City-level	0.126	0.097	0.029	0.002	< 0.001

Notes: This table presents the summary statistics and shows that institutional landlords tend to hold geographically close ("clustered") properties. Panel A reports summary statistics for variables on the lease contracts. Each observation represents a lease contract. Rent is the net effective rent in units of dollars per month per sqft. The size, quality grades, large tenant status, distance to center, INST (dummy for institutional landlord), and the number of properties in the same county, are characteristics of the property being leased. When a lease is matched to multiple properties, we adopt the average characteristic of the matched properties. INST is equal to one when the landlord belongs to banks, equity funds, finance companies, insurers, investment managers, pension funds, sovereign wealth funds, and open-end funds. Panel B shows that institutional landlords tend to hold geographically clustered properties. The sample is restricted to landlords who operate in at least two MSAs and own fewer than 67 properties, the 99th percentile of the data. RBA denotes rentable building area, measuring the size of a property. A major local landlord is a landlord who owns at least five properties in an MSA, a county, or a city, in a given year. In Panel B.6, the extent of ownership clustering is defined as, on average, for each property, the fraction of the owner's other properties that are located in the same area. SE and p-value are based on two-sided two-sample t-tests.

Table 2
Institutional Landlords Tend to Charge Lower Rent

	Rent		
	(1)	(2)	(3)
INST	-1.451***	-0.532***	-0.462***
	(0.048)	(0.046)	(0.071)
Ln(Age)		1.550***	0.797***
		(0.038)	(0.068)
Ln(Size)		-1.887***	-1.513***
		(0.020)	(0.053)
Ln(Dist. to Center)		0.301***	0.280***
		(0.038)	(0.075)
Ln(#Props in Same County)		-0.307***	-0.197***
		(0.014)	(0.025)
Lease Term		0.046***	0.032***
		(0.001)	(0.002)
Quality FE	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes
Tenant FE	No	No	Yes
Adjusted R^2	0.454	0.544	0.756
N	165,534	164,515	63,824

Notes: This table reports the OLS estimates of the relation between institutional ownership and rental prices. *INST* is a dummy variable that equals one if the property is owned by an institutional investor and zero otherwise. Quality FE are fixed effects based on the property's quality grade. There are three quality grades in total: A, B, and C. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 3
Large Tenants Prefer Geographically Clustered Properties and Face Higher Rent in Sequential Contracting

Panel A.1. Actual vs. Benchmark Distances

	Actual Distance				Benchmark Distance			
Num of Props K	Mean	p25	p50	p75	Mean	p25	p50	p75
2	5.888	0	0.372	7.264	15.670	11.011	15.114	20.071
3	7.738	0.237	3.604	12.270	16.242	11.604	15.743	20.505
4-9	9.092	1.285	6.263	14.857	16.785	11.586	16.439	21.170
≥ 10	10.577	5.107	6.072	18.046	17.383	10.703	17.101	25.343
Total	6.728	0	1.426	10.148	15.950	11.192	15.445	20.377

Panel A.2. Difference (Actual – Benchmark Distance)

Num of Props K	Mean Δ	p25	p50	p75	N	t-stat	Sig.	Freq($\Delta < 0$)
2	-9.782	-16.934	-11.209	-4.474	5376	-65.104	1%	0.857
3	-8.504	-14.863	-9.360	-2.735	1467	-33.232	1%	0.819
4-9	-7.692	-13.908	-7.461	-1.216	1090	-27.467	1%	0.790
≥ 10	-6.806	-7.154	-5.289	-3.574	118	-11.277	1%	0.941
Total	-9.223	-16.164	-10.370	-3.532	8051	-78.394	1%	0.842

Panel B. Sequential Contracting and Rent

Dep. variable:	**3 mon**	**6 mon**	**9 mon**	**12 mon**	**15 mon**	**18 mon**
Rent	(1)	(2)	(3)	(4)	(5)	(6)
Sequential	0.182	0.207**	0.199**	0.322***	0.335***	0.420***
	(0.129)	(0.101)	(0.093)	(0.075)	(0.069)	(0.067)
Ln(Size)	−0.722***	−0.722***	−0.722***	−0.722***	−0.722***	−0.723***
	(0.086)	(0.086)	(0.086)	(0.086)	(0.086)	(0.086)
Lease Term	0.025***	0.025***	0.025***	0.025***	0.025***	0.025***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
County × Tenant FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.773	0.773	0.773	0.773	0.773	0.773
N	51,495	51,495	51,495	51,495	51,495	51,495

Notes: Panel A compares the actual distance versus the benchmark distance among large tenants' occupied properties. The benchmark distance is calculated as the average distance among a counterfactual set of randomly drawn properties in the same county and same month. See text for details on the benchmark distance. Number of properties K is the number of active contracts held by the tenant in a county and a month. Panel A.1 displays the actual distances and the benchmark distances. Panel A.2 reports statistics of the difference between the two distances. "Freq($\Delta < 0$)" is the frequency at which the actual distance is smaller than the benchmark distance. The t-statistic is for a one-sided test of $H_0 : \mathbb{E}[\Delta] = 0$ against $H_1 : \mathbb{E}[\Delta] < 0$. Panel B shows OLS estimates of the relation between sequential contracting and rents. "Sequential" equals one if the tenant has any outstanding contract in the same county during the previous h months ($h = 3, 6, 9, 12, 15, 18$). Table A.1 provides more information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 4
Large Tenants Sort Into Institutional Landlords

	Large Tenant		
	(1)	(2)	(3)
INST	0.129***	0.127***	0.095***
	(0.011)	(0.012)	(0.011)
Ln(Age)			-0.062***
			(0.010)
Ln(Dist. to Center)			-0.019
			(0.012)
Quality FE	No	No	Yes
County × Year-Month FE	No	Yes	Yes
Adjusted R^2	0.014	0.041	0.111
N	186,890	173,497	168,430

Notes: This table shows that large tenants are more likely to rent from institutional landlords. The dependent variable in all columns is an indicator that equals to one if the tenant is a large tenant. We identify a tenant as a large tenant if his average leased area size in a county is in the top quartile. *INST* is an indicator variable that equals to one if the property is owned by an institutional investor and zero otherwise. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the county level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5
Large Tenants Tend to Receive Lower Rents from Institutional Landlords

	Rent		
	(1)	(2)	(3)
INST	-0.973***	-0.807***	-0.538***
	(0.089)	(0.087)	(0.117)
Ln(Age)		0.943***	0.658***
		(0.073)	(0.105)
Ln(Size)		-1.564***	-1.262***
		(0.068)	(0.097)
Ln(Dist. to Center)		0.394***	0.371***
		(0.094)	(0.134)
Ln(#Props in Same County)		-0.016	-0.086**
		(0.029)	(0.040)
Lease Term		0.042***	0.033***
		(0.002)	(0.003)
Quality FE	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes
Tenant FE	No	No	Yes
Adjusted R^2	0.511	0.551	0.754
N	40,629	40,428	20,820

Notes: This table shows that large tenants tend to receive lower rent from institutional landlords. The sample is restricted to lease contracts that involve large tenants. We define a tenant as a large tenant if his average leased area in a county is in the top quartile. *INST* is an indicator variable that equals to one if the property is owned by an institutional investor and zero otherwise. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 6
Large Tenants Receive Lower Rents from Institutional Landlords for Properties in a Geographical Cluster

	Rent		
	(1)	(2)	(3)
INST × Cluster	-0.409**	-1.058***	-0.669**
	(0.202)	(0.201)	(0.281)
INST	-0.705***	-0.181	-0.138
	(0.159)	(0.152)	(0.216)
Cluster	0.097	1.184***	0.696**
	(0.125)	(0.206)	(0.274)
Ln(Age)		0.959***	0.666***
		(0.073)	(0.106)
Ln(Size)		-1.578***	-1.274***
		(0.069)	(0.096)
Ln(Dist. to Center)		0.376***	0.361***
		(0.093)	(0.133)
Ln(#Props in Same County)		-0.275***	-0.227***
		(0.053)	(0.070)
Lease Term		0.042***	0.033***
		(0.002)	(0.003)
Quality FE	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes
Tenant FE	No	No	Yes
Adjusted R^2	0.511	0.552	0.754
N	40,629	40,428	20,820

Notes: This table shows that large tenants tend to receive lower rents from institutional landlords for properties located in a geographical cluster of properties. The sample is restricted to lease contracts that involve large tenants. We define a tenant as a large tenant if his average leased area in a county is in the top quartile. *INST* is an indicator variable that equals to one if the property is owned by an institutional investor and zero otherwise. If one landlord owns at least five properties in a county, then we label his properties in that county to form a geographical cluster. *Cluster* is an indicator variable that equals to one if the property is located in a geographical cluster. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 7
Mergers of Institutional Investors and the Difference-in-Differences Design

Panel A: Summary of the Top Three Mergers

Deal No.	Acquirer		Target		Announcement	Completion	# of properties acquired
	Name	Type	Name	Type			
1	Blackstone	Eq. Fund	GLP	Inv. Mgr.	2019/6/2	2019/9/26	1117
2	GIC	SWF	Blackstone	Eq. Fund	2014/12/2	2015/2/27	1054
3	Walton Street Capital	Eq. Fund	DWS Group Americas	Inv. Mgr.	2007/4/23	2007/7/10	311

Panel B: Examples of merger-affected counties

County No.	County	# of properties in the county		# of properties acquired	Merger-affected?
		Acquirer	Target		
1	Los Angeles County	104	33	33	Yes
2	Santa Clara County	34	11	11	Yes
3	Contra Costa County	12	12	12	Yes
4	Placer County	5	0	0	No

Panel C: Examples of treated and control properties

Property No.	Owner (after merger if applicable)	Owner's type	County	Owner's # of properties in the county		Is the property acquired?	The property's group
				Originally owned	Acquired in merger		
1	Blackstone	Eq. Fund	Los Angeles County	104	33	NO	Treated
2	Blackstone	Eq. Fund	Los Angeles County	104	33	YES	Treated
3	Brookfield AM	Inv. Mgr.	Los Angeles County	0	0	NO	Control
4	Prologis	Pub. REIT	Los Angeles County	0	0	NO	Control
5	Blackstone	Eq. Fund	Santa Clara County	34	11	NO	Treated

Notes: Panel A lists the acquirers, targets, dates and other information of the three largest mergers which don't overlap in time and have institutional investors as the acquirer. Announcement and completion dates are obtained from SDC Platinum, and the number of properties acquired is from the CoStar data. In Panel B, we provide examples of the merger-affected counties. A merger-affected county is defined as a county where the acquirer purchased one or more properties from the target firm. In Panel C, we provide examples of the treated and control properties. A treated property is defined as a property in a merger- affected county that is owned by the acquirer or purchased from the target. And the control properties are defined as those in the merger-affected county yet owned neither by the acquirer nor the target.

Table 8
Difference-in-Differences Estimates of the Effect of Institutional Mergers

	Rent			
	(Dummy Treat)		(Continuous Treat)	
	(1)	(2)	(3)	(4)
Treat × Post	-2.263***	-2.343***	-0.751***	-0.768***
	(0.696)	(0.611)	(0.188)	(0.162)
Treat	1.419**	1.449***	0.498***	0.504***
	(0.635)	(0.540)	(0.173)	(0.142)
Ln(Size)		-0.741***		-0.740***
		(0.130)		(0.130)
Ln(Age)		-0.077		-0.081
		(0.324)		(0.325)
Lease Term		0.015***		0.015***
		(0.004)		(0.004)
Ln(Dist. to Center)		0.832		0.845
		(0.719)		(0.732)
Quality FE	No	Yes	No	Yes
Property FE	Yes	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.913	0.917	0.913	0.917
N	7,161	7,078	7,161	7,078

Notes: This table shows difference-in-differences estimates of the effect of institutional mergers on rents. The sample is restricted to contracts signed by large tenants. We identify a tenant as a large tenant if his average leased area size in a county is in the top quartile. In Columns (1) and (2), Treat is a dummy variable that equals one if the property is located in a merger-affected county and is owned by the acquirer or purchased from the target and equals zero otherwise. A merger-affected county is defined as a county where the acquirer purchased one or more properties from the target firm. In Columns (3) and (4), Treat is a continuous variable that reflects the number of properties in a given county that the acquirer gained from the merger (i.e., $\ln(\Delta Properties + 1)$). Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the county level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 9
Dynamic Treatment Effect of Institutional Mergers

	Rent			
	(Dummy Treat)		(Continuous Treat)	
	(1)	(2)	(3)	(4)
Before × Treat	0.021	-0.077	-0.032	-0.056
	(0.563)	(0.596)	(0.171)	(0.174)
After^1 × Treat	-1.787**	-1.886**	-0.664***	-0.678***
	(0.870)	(0.760)	(0.215)	(0.184)
After^2 × Treat	-2.747***	-2.947***	-0.894***	-0.949***
	(1.008)	(0.924)	(0.259)	(0.235)
After^3 × Treat	-1.843**	-1.902***	-0.668***	-0.677***
	(0.822)	(0.701)	(0.209)	(0.176)
Treat	1.328*	1.401**	0.497**	0.512***
	(0.769)	(0.656)	(0.197)	(0.164)
Ln(Size)		-0.743***		-0.742***
		(0.129)		(0.129)
Ln(Age)		-0.070		-0.078
		(0.322)		(0.323)
Lease Term		0.015***		0.015***
		(0.004)		(0.004)
Ln(Dist. to Center)		0.870		0.877
		(0.725)		(0.734)
Quality FE	No	Yes	No	Yes
Property FE	Yes	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.913	0.917	0.913	0.917
N	7,161	7,078	7,161	7,078

Notes: This table reports the estimates of the dynamic treatement effect of the institutional mergers on rents. The sample is restricted to contracts signed by large tenants. We identify a tenant as a large tenant if his average leased area size in a county is in the top quartile. In Columns (1) and (2), Treat is a dummy variable that equals one if the property is located in a merger-affected county and is owned by the acquirer or purchased from the target and equals zero otherwise. A merger-affected county is defined as a county where the acquirer purchased one or more properties from the target firm. In Columns (3) and (4), Treat is a continuous variable that reflects the number of properties in a given county that the acquirer gained from the merger (i.e., $\ln(\Delta Properties+1)$). *Before* is a dummy for the time period of 7-12 months before the treatment; the time period of 1-6 months before the treatment is omitted; $After^1$, $After^2$ and $After^3$ are dummies for the time periods of 1-6 months, 7-12 months, and 13-18 months after the treatment, respectively. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the county level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Appendix A. Additional Tables

Table A.1
Variable Definitions

Variable Name	Definition	Source
	Panel A: Lease-Level Variables	
Rent	Average net effective rent per square foot per month. It combines the nominal rent schedule in the lease contract with the rent concessions (free-rent periods) and the tenant improvement allowances (improvement work paid for by the landlord), and is winsorized at 1% tails.	CompStak
Age	Property age in years (current year minus construction year).	CoStar
Lease Term	Length of the lease contract in months.	CompStak
Size	Square footage of the rented space.	CompStak
Quality	Property quality grade (Class A=1, B=2, C=3; 3=lowest).	CompStak
Large Tenant	Dummy variable that equals to 1 if the tenant's average leased area in the county exceeds the county-level 75th percentile.	CompStak
INST	Dummy variable that equals to 1 if the landlord is an institutional investor. For properties with multiple landlords, it equals to 1 if any of the landlords is an institutional investor. Institutional investors include banks, investment managers, private equity funds, pension funds, finance companies, insurance companies, sovereign wealth funds, and open-end funds.	CoStar
Dist. to Center	Distance to the county center in kilometers.	CoStar
#Props in Same County	The number of the landlord's leased properties in the same county as the property being considered.	CompStak
	Panel B: Property-Level Variables	
EXP	Expenditure/Current-period Revenue	Trepp
NOI	Net Operating Income/Current-period Revenue	Trepp
Debt	Debt Service/Current-period Revenue	Trepp
Full Occ	Dummy variable that equals to 1 for full tenant occupancy.	Trepp
Ln(App Value)	Natural logarithm of most recent property appraisal valuation.	Trepp

(continued) Variable Definitions

Variable Name	**Definition**	**Source**
RBA	Rentable Building Area	Costar
Time since last valuation	Years since the most recent valuation.	Trepp
#Props in Same County	The number of properties owned by the same landlord in the same county.	CoStar

Notes: This table provides definitions for all the variables used in this paper. The summary statistics of the main variables can be found in Tables 1 and A.2. All financial variables in Panel B are winsorized at the 5% level.

Table A.2
Summary Statistics of Property-Level Variables from the Trepp Database

	Obs.	Mean	Median	Std. dev.	P25.	P75.
EXP	18,599	0.247	0.241	0.150	0.142	0.345
NOI	18,703	0.754	0.760	0.150	0.656	0.861
Debt	18,663	0.440	0.424	0.151	0.328	0.539
Full Occ	22,638	0.761	1	0.426	1	1
INST	23,893	0.275	0	0.446	0	1
Age	23,759	28.339	26	17.590	15	39
RBA	23,893	151,455	78,177	204,717	37,467	180,252
Ln(App Value)	23,851	15.797	15.761	1.025	15.124	16.447
Duration	23,671	3.758	3	2.935	2	6
Dist. to Center (km)	23,884	19.077	15.648	14.944	8.953	24.726
#Props in Same County	23,884	9.761	3	19.431	1	10

Notes: This table reports summary statistics for the property-level variables from the Trepp database. For a subset of properties that issued Commercial Mortgage-Backed Securities (CMBS) between 2001 and 2022, we get their property-level cash flows and operating metrics from the Trepp database. Trepp provides standardized financial reporting for securitized commercial properties, including detailed cash flow and debt service statistics. We match the Trepp data to the properties in our sample using the property's address, characteristics, and issuance identifiers. This dataset is used in the regressions reported in Table A.13. In this table, each observation is at the property–year level.

Table A.3
Institutional Landlords Tend to Hold Geographically Clustered Properties: Patterns by the Landlord's Properties Portfolio's Size

	Small portfolio			Medium portfolio			Large portfolio		
	INST	Others	Diff.	INST	Others	Diff.	INST	Others	Diff.
Panel A: Nation-wide and local ownership of properties									
# Properties (nation-wide)	2.649	2.313	0.336	4.211	3.183	1.028	15.935	8.703	7.232
RBA (nation-wide)	0.025	0.024	0.001	0.089	0.083	0.006	1.671	0.893	0.778
# Properties (MSA-level)	2.265	2.105	0.160	2.849	2.410	0.439	6.381	4.289	2.092
Panel B: The extent of ownership clustering									
MSA-level	0.083	0.055	0.028	0.180	0.138	0.042	0.235	0.229	0.007
County-level	0.073	0.051	0.022	0.141	0.122	0.019	0.190	0.193	-0.004
City-level	0.053	0.044	0.009	0.110	0.101	0.008	0.142	0.148	-0.006
Landlord-year observations	1,309	136,917	–	2,756	135,461	–	8,269	129,917	–

Notes: This table presents a robustness check to the results in Panel B of Table 1. We split all the landlords into three equal-sized groups based on the size of their porfolios of properties, measured by the total rentable building area (RBA) of the properties. We only include landlords who operate in at least two MSAs and own fewer than 67 properties, the 99th percentile of the data. INST are institutional landlords, including banks, equity funds, finance companies, insurers, investment managers, pension funds, sovereign wealth funds, and open-end funds. All remaining landlords are classified as Others. Diff. is equal to INST − Others. Panel A reports the average number of properties and total RBA in millions of square feet owned by the landlords. In Panel B, the extent of ownership clustering is defined as, on average, for each property, the fraction of the owner's other properties that are located in the same area.

Table A.4
Properties in Geographical Clusters Have Better Access to Major Highways

	Ln(Distance) (1)	Distance (2)	Within 1 mile (3)	Ln(Distance) (4)	Distance (5)	Within 1 mile (6)
Cluster A	-0.064***	-0.114***	0.024***			
	(0.011)	(0.017)	(0.004)			
Cluster B				-0.070***	-0.118***	0.027***
				(0.016)	(0.023)	(0.006)
Ln(Size)	-0.038***	-0.075***	0.017***	-0.038***	-0.075***	0.017***
	(0.005)	(0.008)	(0.002)	(0.005)	(0.008)	(0.002)
Ln(Age)	-0.016	-0.004	0.007	-0.016	-0.004	0.007
	(0.010)	(0.015)	(0.004)	(0.010)	(0.015)	(0.004)
INST	-0.025	-0.028	0.022***	-0.026	-0.031	0.022***
	(0.019)	(0.024)	(0.008)	(0.019)	(0.023)	(0.008)
County × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.309	0.890	0.187	0.309	0.890	0.187
N	13,993,235	13,993,235	13,993,235	13,993,235	13,993,235	13,993,235

Notes: This table shows that properties belonging to a geographical cluster have better access to major highways. The regression is at the property level. As the dependent variables, Distance is the distance of the property to the nearest major highway. Within 1 mile is a dummy variable that equals to one when the property is within one mile to nearest major highway. Major highways are identified using primary roads in the U.S. Census TIGER/Line shapefiles, corresponding to MTFCC code S1100. If one landlord has a certain number of actively-leased properties in a county, then we label his properties in that county to form a geographical cluster. Cluster A and Cluster B are dummy variables that equal to one if the property's landlord has at least three and five properties in the county, respectively, and zero otherwise. *INST* is an indicator variable equal to one if the property is owned by an institutional investor and zero otherwise. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the county level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.5
Rent Is Higher When Tenants Contract with Multiple Landlords

	Rent		
	(1)	(2)	(3)
Multiple Landlords	1.109***	1.175***	0.145**
	(0.070)	(0.065)	(0.062)
Ln(Age)		1.509***	0.783***
		(0.064)	(0.068)
Ln(Size)		-1.666***	-1.528***
		(0.058)	(0.053)
Ln(Dist. to Center)		0.025	0.282***
		(0.059)	(0.075)
Ln(#Props in Same County)		-0.156***	-0.225***
		(0.025)	(0.025)
Lease Term		0.039***	0.032***
		(0.002)	(0.002)
Quality FE	Yes	Yes	Yes
County × Year-Month FE	No	No	Yes
Tenant FE	Yes	Yes	Yes
Adjusted R^2	0.586	0.630	0.756
N	76,742	76,290	63,824

Notes: This table reports OLS estimates of the relation between contracting with multiple landlords and the rental price.*Multiple Landlords* is an indicator variable that equals to one if the tenant signs leases with more than one landlord in the same county, and zero otherwise. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.6
Robustness: Large Tenants Sort Into Institutional Landlords (Alternative Definitions of Large Tenants)

	Large Tenant By Employment		Large Tenant By Leased Area (Top Tercile)	
	(1)	(2)	(3)	(4)
INST	0.063***	0.049***	0.138***	0.104***
	(0.006)	(0.005)	(0.015)	(0.014)
Ln(Age)		-0.027***		-0.073***
		(0.005)		(0.012)
Ln(Dist. to Center)		-0.001		-0.024
		(0.007)		(0.015)
Quality FE	No	Yes	No	Yes
County × Year-Month FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.046	0.065	0.044	0.109
N	173,497	168,430	173,497	168,430

Notes: This table, a robustness check to the results in Table 4, shows that large tenants are more likely to rent from institutional landlords. The dependent variable is a large-tenant indicator. Large Tenant By Employment is equal to one for tenants in the top quartile of the employment size. Large Tenant By Leased Area is equal to one for tenants whose average leased area in a county is in the top tercile. *INST* is an indicator variable that equals to one if the property is owned by an institutional investor and zero otherwise. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.7
Robustness: Large Tenants Tend to Receive Lower Rents from Institutional Landlords (Alternative Definitions of Large Tenants)

	Rent			
	By Employment (Top Quartile)		By Leased Area (Top Tercile)	
	Controls	Full	Controls	Full
	(1)	(2)	(3)	(4)
INST	-1.001***	-0.663***	-0.807***	-0.503***
	(0.120)	(0.131)	(0.087)	(0.100)
Ln(Age)	1.987***	1.060***	0.943***	0.628***
	(0.099)	(0.111)	(0.073)	(0.095)
Ln(Size)	-1.943***	-1.642***	-1.564***	-1.312***
	(0.057)	(0.087)	(0.068)	(0.079)
Ln(Dist. to Center)	0.583***	0.335***	0.394***	0.298***
	(0.108)	(0.119)	(0.094)	(0.113)
Ln(#Props in Same County)	-0.382***	-0.286***	-0.016	-0.110***
	(0.040)	(0.047)	(0.029)	(0.034)
Lease Term	0.051***	0.038***	0.042***	0.034***
	(0.002)	(0.003)	(0.002)	(0.002)
Quality FE	Yes	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes	Yes
Tenant FE	No	Yes	No	Yes
Adjusted R^2	0.551	0.698	0.551	0.754
N	31,064	22,114	40,428	28,463

Notes: This table, a robustness check to results in Table 5, shows that large tenants tend to receive lower rent from institutional landlords. The sample is restricted to lease contracts that involve large tenants. In columns (1)–(2), a large tenant is one that is in the top quartile of the employment size. In columns (3)–(4), a large tenant is one whose average leased area in a county is in the top tercile. *INST* is an indicator variable equal to one if the property is owned by an institutional investor and zero otherwise. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.8
Robustness: Large Tenants Receive Lower Rents from Institutional Landlords for Properties in a Geographical Cluster (Alternative Definitions of Large Tenants)

	Rent			
	By Employment (Top Quartile)		By Leased Area (Top Tercile)	
	Controls	Full	Controls	Full
	(1)	(2)	(3)	(4)
INST × Cluster	-0.866***	-0.686**	-0.838***	-0.578**
	(0.269)	(0.297)	(0.164)	(0.232)
INST	-0.507**	-0.245	-0.243*	-0.145
	(0.211)	(0.233)	(0.127)	(0.180)
Cluster	1.179***	0.516*	0.988***	0.454*
	(0.267)	(0.297)	(0.164)	(0.234)
Ln(Age)	1.998***	1.066***	0.974***	0.635***
	(0.099)	(0.111)	(0.062)	(0.095)
Ln(Size)	-1.957***	-1.655***	-1.582***	-1.322***
	(0.057)	(0.087)	(0.053)	(0.079)
Ln(Dist. to Center)	0.566***	0.330***	0.400***	0.292***
	(0.107)	(0.119)	(0.074)	(0.113)
Ln(#Props in Same County)	-0.662***	-0.384***	-0.268***	-0.194***
	(0.074)	(0.082)	(0.043)	(0.060)
Lease Term	0.051***	0.038***	0.043***	0.034***
	(0.002)	(0.003)	(0.002)	(0.002)
Quality FE	Yes	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes	Yes
Tenant FE	No	Yes	No	Yes
Adjusted R^2	0.552	0.698	0.556	0.754
N	31,064	22,114	56,674	28,463

Notes: This table, a robustness check to results in Table 6, shows that large tenants tend to receive lower rents from institutional landlords for properties located in a geographical cluster of properties. The sample is restricted to lease contracts that involve large tenants. In columns (1)–(2), a large tenant is one whose employment size is in the top quartile. In columns (3)–(4), a large tenant is one whose average leased area in a county is in the top tercile. *INST* is an indicator variable that equals to one if the property is owned by an institutional investor and zero otherwise. If one landlord has at least five actively-leased properties in a county, then we label his properties in that county to form a geographical cluster. *Cluster* is an indicator variable equal to one if the property is located in a geographical cluster. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.9
Testing the Alternative Explanation: Information Channel

	Rent			
	Sample: Large Tenants By Leased Area (Top Quartile)		Sample: Large Tenants By Leased Area (Top Tercile)	
	(1)	(2)	(3)	(4)
INST × Cluster	-0.668**	-0.667**	-0.578**	-0.577**
	(0.280)	(0.280)	(0.232)	(0.232)
INST	-0.137	-0.137	-0.145	-0.144
	(0.216)	(0.216)	(0.180)	(0.180)
Cluster	0.696**	0.697**	0.454*	0.456*
	(0.275)	(0.275)	(0.235)	(0.235)
Long Relation	0.029		0.005	
	(0.101)		(0.086)	
Ln(Relation Length)		0.010		0.010
		(0.029)		(0.024)
Control Variables	Yes	Yes	Yes	Yes
Quality FE	Yes	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes	Yes
Tenant FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.754	0.754	0.754	0.754
N	20,820	20,820	28,463	28,463

Notes: This table shows that large tenants receive lower rents from institutional landlords for properties in a geographical cluster, after controlling for the relationship length between the tenant and the landlord. The sample is restricted to large tenants. In columns (1)–(2), a large tenant is one whose average leased area in a county is in the top quartile, the same definition as in the main results tables. In columns (3)–(4), a large tenant is one whose average leased area in a county is in the top tercile. *INST* is an indicator variable that equals to one if the property is owned by an institutional investor and zero otherwise. If one landlord owns at least five properties in a county, then we label his properties in that county to form a geographical cluster. Cluster is an indicator variable that equals to one if the property is located in a geographical cluster. Long Relation is an indicator that equals to one if the tenant and the landlord have any prior contracting history anywhere in the nation before the current contract month. Ln(Relation Length) is the log of one plus the number of months elapsed since the first nation-wide contract between the tenant and the landlord. Control variables include the property age, property size, distance to the city center, the number of properties owned by the landlord in the same county, and the lease term. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.10
Testing the Alternative Explanation: Tenant–Landlord Co-Ownership

	Rent		
	(1)	(2)	(3)
INST × Cluster	-0.777***	-1.057***	-0.665**
	(0.205)	(0.201)	(0.281)
INST	-0.358**	-0.182	-0.142
	(0.160)	(0.152)	(0.216)
Cluster	0.289**	1.183***	0.692**
	(0.126)	(0.206)	(0.274)
Ln(Age)		0.959***	0.667***
		(0.073)	(0.106)
Ln(Size)		-1.579***	-1.275***
		(0.069)	(0.096)
Ln(Dist. to Center)		0.377***	0.362***
		(0.093)	(0.133)
Ln(#Props in Same County)		-0.274***	-0.226***
		(0.053)	(0.070)
Lease Term		0.042***	0.033***
		(0.002)	(0.003)
Quality FE	No	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes
Tenant FE	No	No	Yes
Adjusted R^2	0.501	0.552	0.754
N	41,133	40,425	20,813

Notes: This table shows that large tenants receive lower rents from institutional landlords for properties in a geographical cluster. From all the available 13F filings, we identify all the landlords that are 13F investors and all the tenants whose shares belong to landlord's investment portfolios. Then we drop all the leases in which the tenant's shares belong to the landlord's investment portfolios. Thus this is a robustness check to Table 6. The sample is restricted to large tenants, defined as tenants whose average leased area in a county is in the top quartile. *INST* is an indicator variable that equals to one if the property is owned by an institutional investor and zero otherwise. If one landlord owns at least five properties in a county, then we label his properties in that county to form a geographical cluster. *Cluster* is an indicator variable that equals to one if the property is located in a geographical cluster. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the tenant level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.11
Robustness: Difference-in-Differences Estimates of the Effect of Institutional Mergers (Alternative Definitions of Large Tenants)

	Rent			
	Sample: Large Tenants By Employment		Sample: Large Tenants By Leased Areas (Top Tercile)	
	(Dummy Treat)	(Continuous Treat)	(Dummy Treat)	(Continuous Treat)
	(1)	(2)	(3)	(4)
Treat × Post	-4.169***	-1.294***	-1.646***	-0.571***
	(1.029)	(0.286)	(0.511)	(0.140)
Treat	2.272**	0.707**	1.160**	0.420***
	(0.999)	(0.301)	(0.450)	(0.122)
Ln(Size)	-0.460	-0.458	-0.748***	-0.748***
	(0.400)	(0.399)	(0.092)	(0.092)
Ln(Age)	-0.812	-0.842	-0.420	-0.423
	(0.926)	(0.926)	(0.262)	(0.263)
Lease Term	0.015**	0.015**	0.016***	0.016***
	(0.006)	(0.006)	(0.004)	(0.004)
Ln(Dist. to Center)	0.256	0.273	1.558*	1.554*
	(1.500)	(1.503)	(0.798)	(0.803)
Quality FE	Yes	Yes	Yes	Yes
Property FE	Yes	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.895	0.895	0.899	0.899
N	3,682	3,682	10,657	10,657

Notes: This table, a robustness check to Table 8, shows difference-in-differences estimates of the effect of institutional mergers on rents, under alternative definitions of large tenants. The sample is restricted to contracts signed by large tenants. We identify a tenant as a large tenant if his average leased area size in a county is in the top quartile. In columns (1) and (2), a large tenant is one whose employment size is in the top quartile. In columns (3) and (4), a large tenant is one whose average leased area in a county is in the top tercile. In columns (1) and (3), Treat is a dummy variable that equals one if the property is located in a merger-affected county and is owned by the acquirer or purchased from the target and equals zero otherwise. A merger-affected county is defined as a county where the acquirer purchased one or more properties from the target firm. In columns (2) and (4), Treat is a continuous variable that reflects the number of properties in a given county that the acquirer gained from the merger (i.e., $\ln(\Delta Properties + 1)$). Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the county level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.12
Robustness: Dynamic Treatment Effect of Institutional Mergers (Alternative Definitions of Large Tenants)

	Rent			
	Sample: Large Tenants By Employment		Sample: Large Tenants by Leased Areas (Top Tercile)	
	(Dummy Treat)	(Continuous Treat)	(Dummy Treat)	(Continuous Treat)
	(1)	(2)	(3)	(4)
Before × Treat	-1.337	-0.286	-0.352	-0.188
	(1.769)	(0.511)	(0.642)	(0.161)
After^1 × Treat	-4.098**	-1.262**	-1.382**	-0.515***
	(1.853)	(0.574)	(0.691)	(0.186)
After^2 × Treat	-5.118***	-1.570***	-2.065**	-0.750***
	(1.706)	(0.515)	(0.807)	(0.195)
After^3 × Treat	-2.783**	-0.782**	-1.830**	-0.708***
	(1.135)	(0.362)	(0.727)	(0.169)
Treat	2.454*	0.715*	1.314**	0.521***
	(1.360)	(0.418)	(0.652)	(0.146)
Control Variables	Yes	Yes	Yes	Yes
Quality FE	Yes	Yes	Yes	Yes
Property FE	Yes	Yes	Yes	Yes
County × Year-Month FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.895	0.895	0.899	0.899
N	3,682	3,682	10,657	10,657

Notes: This table, a robustness check to Table 9, reports the estimates of the dynamic treatement effect of the institutional mergers on rents, under alternative definitions of large tenants. In columns (1) and (2), a large tenant is one whose employment size is in the top quartile. In columns (3) and (4), a large tenant is one whose average leased area in a county is in the top tercile. In columns (1) and (3), Treat is a dummy variable that equals one if the property is located in a merger-affected county and is owned by the acquirer or purchased from the target and equals zero otherwise. A merger-affected county is defined as a county where the acquirer purchased one or more properties from the target firm. In columns (2) and (4), Treat is a continuous variable that reflects the number of properties in a given county that the acquirer gained from the merger (i.e., $\ln(\Delta Properties + 1)$). *Before* is a dummy for the time period of 7-12 months before the treatment; the time periods of 1-6 months before the treatment is omitted; $After^1$, $After^2$ and $After^3$ are dummies for the time period of 1-6 months, 7-12 months, and 13-18 months after the treatment, respectively. Control variables include the property age, property size, distance to the city center, the number of properties owned by the landlord in the same county, and the lease term. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the county level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table A.13
Properties of Institutional Landlords Have Higher Cash Flows and Occupancy Rates

Depvar:	EXP	NOI	Debt	Full Occ
	(1)	(2)	(3)	(4)
INST	-0.023***	0.022***	-0.016***	0.044***
	(0.008)	(0.008)	(0.006)	(0.017)
Ln(Age)	0.025***	-0.026***	-0.019***	-0.118***
	(0.006)	(0.005)	(0.005)	(0.012)
Ln(Size)	-0.018***	0.018***	-0.004	0.111***
	(0.004)	(0.004)	(0.003)	(0.013)
Ln(Dist. to Center)	0.006	-0.006	-0.002	-0.004
	(0.006)	(0.006)	(0.006)	(0.011)
Ln(#Props in Same County)	0.016***	-0.017***	-0.005**	-0.053***
	(0.002)	(0.002)	(0.002)	(0.007)
Ln(App Value)	-0.008*	0.009**	0.003	-0.115***
	(0.004)	(0.004)	(0.004)	(0.014)
Time since last valuation	-0.004***	0.005***	0.007***	0.005*
	(0.001)	(0.001)	(0.001)	(0.002)
County × year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.263	0.271	0.335	0.184
N	14,790	14,910	14,755	20,419

Notes: This table shows OLS estimates of the relationship between institutional ownership and property-level operating metrics. The dependent variables are expenditure (EXP) in column (1), net operating income (NOI) in column (2), debt service (Debt) in column (3), and an indicator for full tenant occupancy (Full Occ) in column (4). The sample consists of cash flow statistics for properties that issued Commercial Mortgage-Backed Securities (CMBS) between 2001 and 2022, based on data from the Trepp database. *INST* is an indicator variable that equals to one if the property is owned by an institutional investor and zero otherwise. We control for the logarithm of property age, property size (Rentable Building Area), distance to the city center, the number of properties owned by the same owner in the same county in the same year, the logarithm of the most recent property valuation, and the number of years since the most recent valuation. Expenditure, net operating income, and debt service are scaled by the revenue of the same year and are winsorized at the 5% level. Table A.1 in the Appendix provides additional information about the variables. Standard errors, clustered at the county level, are reported in parentheses below the coefficient estimates. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.