

Distributional Effects of Exclusive Dealing in Commercial Real Estate

Camilla Schneier*

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Abstract

Exclusive dealing contracts in commercial real estate are common and change where retailers can locate and how households shop. This paper provides the first estimates of the effect of these exclusive dealing contracts on retail competition and consumer welfare. Using novel descriptive evidence, scraped from publicly-available leases and deeds, I document the prevalence and characteristics of these contracts, including the kinds of retailers that employ them, and present evidence supporting their intended effect of limiting business competition. With this new data, I estimate a model of consumer demand and retailer location choice where exclusive agreements are endogenous in the commercial real estate market. Product demand estimates are predictive of which stores use exclusive dealing contracts. Relative to a counterfactual without exclusive dealing, the contracts benefit large retailers, disadvantage smaller retailers, and harm most consumers.

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1 Introduction

Restrictive covenants are exclusive dealing contracts in commercial real estate which forbid certain firms from operating on designated premises. These private agreements, commonly embedded in commercial leases and deeds, are intended to protect the business interests of one or both parties. For example, a Safeway in Chicago forbids its landlord from leasing space to competing grocers, drug stores, liquor stores, and convenience stores. While such contracts are largely unstudied, there is a rising concern that exclusive dealing forecloses on competitor entry and contribute to the creation of food deserts. ([Leslie \(2021\)](#), [Kang \(2022\)](#), [Frerick \(2024\)](#)).

Despite potentially large implications for consumer welfare and retail competition, there is not yet economics research analyzing the prevalence or impact of exclusive dealing contracts in commercial real estate. The exclusive dealing contracts can influence which firms enter the market, their locations, pricing, and importantly, which stores co-locate – each of which has implications for consumer choices, pricing, access, as well as consumer welfare.

This paper is the first to establish the prevalence of exclusive dealing contracts, their effects on consumer welfare and firm profitability, and their distributional effects on both consumers and firms. To do so, I document the prevalence of exclusive dealing contracts using novel data scraped from publicly-available leases and deeds. I show evidence that exclusive dealing does limit competition: prices are 20% higher in exclusive dealing contracts, stores with exclusive dealing contracts have 30% fewer competitors nearby, and consumer expenditures significantly differ when nearby retailers use these contracts. To quantify the underlying mechanisms, I build a model with two markets: first, a commercial real estate market which endogenizes the choice of exclusive dealing contracts, and second, a consumer demand model that captures retailer complementarities. The consumer demand model with retail complementarities allows me to estimate the profitability of different retailer strategy profiles which I use to estimate retailers' demand for exclusivity. Novel data allows me estimate landlords' supply of exclusivity. This framework enables a counterfactual analysis where landlords and retailers cannot explicitly contract on exclusivity to understand how the contracts change where retailers locate, how consumers shop, and consumer welfare.

My empirical analysis focuses on data from Chicago, one of the largest and most diverse cities in the United States. Due to its mix of wealthy and poor neighborhoods, dense and sparse neighborhoods, and variety of retail environments – from standalone stores to shopping malls, Chicago is the ideal setting to study the average and distributional effects of exclusive

dealing.

To conduct my analysis, I construct two novel data sets: one on landlord locations and another on exclusive dealing contracts. I construct a landlord's locations from a dataset acquired from Build Central (formerly named Planned Grocery), a startup which collects and sells planned retail locations to retailers so that the retailers know where they and their competitors may enter; with this data, I construct the retailers' location choice set. Next, I build the dataset on exclusive dealing contracts: I scrape publicly available documents from the Cook County (Chicago) recorder website, digitize the pdfs, and extract the exclusive dealing contracts. From this I construct a yearly panel with the set of properties that forbid retailer entry, which retailers are forbidden from entering, and which retailers have the exclusive dealing contract in their leases.

With this data, I document the prevalence of exclusive dealing contracts, document the kinds of retailers that employ them, and show evidence consistent with the retailers' stated goal of limiting business competition. First, I find that all the large national grocery chains have exclusive dealing contracts in at least one store location, 36% of grocery chains have exclusive dealing contracts, and the contracts are also commonly found in drug and discount chains. Second, I find that prices are 20% higher for stores with exclusive dealing contracts, controlling for retail chain and surrounding demographics. Third, I find that within retail chain, stores with exclusive dealing contracts are surrounded by fewer competitors than stores without exclusive dealing contracts within .2 mi. This .2 mi radius is the radius the literature has documented as relevant for cross-store spillovers (for recent empirical evidence on spillovers in the grocery industry, see [Qian et al. \(2023\)](#) and [Knight \(2023\)](#)).

I show that stores with exclusive dealing contracts have a significantly different effects on consumer purchases than stores without the contracts. Leveraging an event study design of grocery exit in a household's zip code, I show that consumers reduce grocery expenditures when the retailer leaving the premises had an exclusive dealing contract with its landlord. Once the grocery store leaves, consumers substitute away from grocery stores and increase spending at dollar stores. The consumer spending patterns are persistent, and after a few years, the consumer expenditure recovers almost to pre-exit levels. Exploring the underlying market structure, I show that consumer expenditures – for grocery and dollar – return towards baseline once a new retailer enters the zip code. In contrast, consumers expenditure remain unchanged (before and after the grocer's exit) when the grocery store that exits does not have an exclusive dealing agreement with the landlord. Exploring the underlying market structure, stores without exclusive dealing agreements that exit are replaced by grocers faster

than stores with exclusive dealing agreements. The event study results show not only that there is likely pass through from the commercial real estate market to the product market, but that the exclusive dealing contracts may have implications for consumer welfare.

To understand the implications of exclusive dealing for consumer welfare, I build a model that captures key features of the consumer product and commercial real estate markets and allows for equilibrium effects of exclusive dealing. By solving the model with exclusive dealing, the counterfactual allows determination which neighborhoods gain and lose retailers due to exclusive dealing, and in particular, the effect on food deserts. For consumers, the model allows us to decompose welfare effects into key features of the markets: changes due to retailer entry, foreclosure, as well as changes in prices and distances to retailers to determine which magnitude matters the most. For retailers and landlords, the model allows us to assess profitability with or without exclusive dealing, and to determine which retailers – large or small – benefit the most from exclusive dealing.

In the consumer product market, households multihome – shop at multiple retailers on the same trip – and have preferences over retailer prices, distances from home, and retailer-specific characteristics. To account for spillovers across firms, as well as patterns of trip-chaining documented in the data¹, the model allows for complementarities across individual retailers (following Gentzkow (2007)'s model with complementarities). This allows me to document, relative to the outside good, which stores are complements and which are substitutes. Additionally, demand estimates allow computation of the variable profits for each possible set of retailer locations, and for the quantification of consumer welfare.

In the commercial real estate market, entry proceeds in two steps. In any given locations, first, a larger retailer enters, and, second, co-locating stores enter. Complementarities and multi-homing across retailers in the product market create externalities between retailers. In many locations, the retailer can make the location profitable enough for other retailers to enter nearby, including competing retailers which will reduce the retailer's profits². As a result, the exclusive dealing contracts exist in part to limit competition from retailers who limit the competition the retailer generates.

The supply-side of the commercial real estate market captures both the retailers' and land-

¹In the data, 40% of grocery store trips are to more than one retailer, and 55% of grocery store trips to a national grocery store is to a store nearby (if it is possible to shop at a nearby store with that retailer).

²In particular, in grocery-anchored or other-anchored real estate, larger retailers often drive demand for smaller retailers. The “anchor” store is so important to demand for nearby stores that the landlord leases to the anchor store first and that new developments often do not proceed without an anchor tenant in place.

lords' incentives for exclusive dealing. A retailer choosing locations balances higher prices from paying for exclusivity with the probability that a co-locating retailer will decrease its profits if it does not have an exclusive dealing agreement on the premises. A landlord choosing prices and whether or not to offer an exclusive dealing contract balances the probability of attracting a retailer, higher revenues from the retailer, against the increased difficulty of finding a co-locating tenant.

Estimation proceeds in three steps. First, I estimate demand in the product market using maximum likelihood and use the estimates to compute the extent to which there are complementarities across retailers (relative to the outside good), profitability of each location for each location choice of retailers, and consumer welfare (following Berry and [Bayer et al. \(2007\)](#)). Next, I take the estimates from the product market and estimate the probability of entry and expected profitability from the co-locating stores. I estimate the co-locating store choice as a discrete-choice problem of location choice with no exclusive dealing. This step is also estimated with maximum likelihood. These estimates allow me to compute the expected loss in profits from exclusive dealing to the landlord. Finally, I use data on the contracts, prices, and set of potential locations to estimate retailer's choice problem. I estimate the cost and exclusive dealing parameters with simulated method of moments, which allows me to compute the parameters that determine probability of entry and expected profitability for each retailer and locations.

I find that closer substitutes, as predicted by the demand estimates, are correlated with the contents of the exclusive dealing contracts for that retailer. That is, the stronger the substitutability between retailers, the more likely that retailer is prohibited from entering nearby property. These results serve as a check to both the model validity and the effectiveness of the exclusive dealing contracts.

Using the estimated parameters, I compute a counterfactual where retailers and landlords cannot explicitly contract on exclusivity. I estimate consumer welfare with the compensating variation, and expected landlord, retailer, and co-locating firm profitabilities to understand the effect exclusive dealing has on the commercial real estate and product markets. The counterfactuals show that large national grocers benefit the most from exclusive dealing contracts, and smaller stores would benefit the most from a ban on exclusive dealing. The welfare effects for consumers are depend on the location: In the poorest and most retail sparse neighborhoods, consumers benefit from this form of exclusive dealing, in poor locations near wealthier ones, consumers would benefit from a ban on exclusive dealing.

Related literature The paper’s primary contribution is to develop an empirical framework to evaluate the effects of exclusive dealing in the upstream commercial real estate market on firm profitability and downstream consumer welfare. Additionally, the paper estimates the distributional consequences for firms and consumers.

This paper contributes to the growing literature on exclusive dealing. This paper makes three contributions to this literature. The first contribution is conceptual: this paper highlights how spillovers across co-locating stores, combined with asymmetric information between landlords and retailers, create an externality that generates the need for an explicit exclusive dealing contract³. To my knowledge, this externality has not yet been studied in the context of exclusive dealing. This adds to the large theoretical literature on theories of exclusive dealing (Posner (1976), Bork (1978)), Marvel (1982), Rasmusen et al. (1991), Besanko and Perry (1993), Aghion and Bolton (1987), Bernheim and Whinston (1998), Klein and Murphy (1988), Segal and Whinston (2000), Fumagalli and Motta (2006), Simpson and Wickelgren (2007), Asker and Bar-Isaac (2014))⁴.

The second contribution is empirical: direct observation of both the contracts and prices allows me to both distinguish when the exclusive dealing is explicitly contracted on⁵ and assess how exclusive dealing changes the equilibrium by estimating counterfactual where exclusive dealing is banned. Lack of data on contracts and prices has largely hampered the

³First, this externality emerges because retailers drive foot traffic to nearby firms, and do not wish to suffer losses from the retailers they attracted to the location. In principle, exclusive dealing prevents the retailer’s profits from being negatively affected by the demand it drives to the location. If the landlord knew the profitability of retailer entry combinations, the landlord could choose whichever combination achieved the highest total surplus. However, the landlord cannot observe retailer profits and thus cannot choose the set of retailers that will maximize total surplus to each location (as in the spirit of Bernheim and Whinston (1998), Nurski and Verboven (2016)). The exclusive dealing is therefore explicitly contracted on due to asymmetric information in the commercial real estate market: the landlord instead charges a premium for exclusivity.

⁴In the theoretical literature, the welfare effects of exclusive dealing are ambiguous and are tied to the theories of exclusive dealing (or why the exclusive dealing exists). Early work – called the “Chicago school” – showed that absent externalities, exclusive dealing could not be anticompetitive because upstream firm has pay the downstream firm accept exclusivity (Posner (1976) and Bork (1978)). Then, later work found many cases where externalities lead exclusive dealing contracts to be anticompetitive. To summarise the theoretical findings, exclusive dealing is considered pro-competitive when (a) it increases efficiency, for example by reducing double marginalization, (b) ensuring monopoly profits encourages investment and thus a higher-quality product and (c) ensuring monopoly profits allows for retailer entry in the first place; exclusive dealing is considered anti-competitive when it partially or totally forecloses on another firm’s entry, due to some externality. For example Bernheim and Whinston (1998) show that when it is possible to have an exclusive deal in one market that forecloses on a rival’s entry in a different market, the exclusive dealing is contract maybe anti-competitive in that second market.

⁵When there is exclusive dealing but no formal contract, all parties are in agreement that the exclusive dealing agreement is beneficial. The observed contract is a result of asymmetric information between landlord and tenant.

empirical literature: in lieu of data on the contracts, other papers have instead developed empirical tests to diagnose foreclosure ([Asker \(2016\)](#)), and estimated product market demand to determine both whether exclusive dealing is profitable and firms' willingness to pay ([Nurski and Verboven \(2016\)](#), [Sinkinson \(2020\)](#)).

The third contribution is a data contribution: this paper brings novel evidence of how retailers sort in an important market. There is a long literature in retail on grocery demand ([Bell et al. \(1998\)](#), [Smith \(2004\)](#), [Mehta \(2007\)](#), [Song and Chintagunta \(2007\)](#), [Smith and Øyvind Thomassen \(2012\)](#), [Mehta and Ma \(2012a\)](#), [Thomassen et al. \(2017\)](#), [Handbury \(2021\)](#), [Leung and Li \(2021\)](#), [Mehta and Ma \(2012b\)](#)), as well as interest in food access and food deserts ([Allcott et al. \(2019\)](#)). Relative to the existing literature, this paper endogenizes the retailer location choice by incorporating data on real estate prices, exclusive dealing contracts, and potential locations in the estimation. Additionally, this paper uses data on store locations to estimate household preferences for specific retailer as well as households distaste for travel. [?](#) also estimates preferences for specific retailers, focusing on consumer heterogeneity, while this paper focuses on multi-homing and complementarities across stores.

Relative to prior work on exclusive dealing, the exclusive dealing contracts documented here are heterogeneous and broad – the contracts vary within retailer, across retailers, and across space. This is in contrast to prior empirical literature which has focused on exclusive dealing contracts that tend to block a single product, focusing on markets such as beer, hamburgers, cable television, etc... (see [Lafontaine and Slade \(2007\)](#) for a survey of the empirical literature, as well as [Chipty \(2001\)](#), [Sass \(2005\)](#), [Lee \(2013\)](#), [Ater \(2015\)](#), [Nurski and Verboven \(2016\)](#), [Asker \(2016\)](#), [Le \(2024\)](#))⁶. In contrast, these contracts affect the location of every single retailer in Chicago. The contracts also give a “revealed profitability” approach to understanding business’ perceived competition.

This paper builds on the literature on multi-homing and trip-chaining ([Oh and Seo \(2023\)](#), [Miyauchi et al. \(2022\)](#), [Rhodes and Zhou \(2019\)](#), [Relihan \(2022\)](#)), as well as the literature on local spillovers in commercial real estate ([Qian et al. \(2023\)](#), [Knight \(2023\)](#)), since multi-homing and spillovers are important features of the data and motivation for the contracts. One challenge in the literature is determining the set of potential locations a retailer might otherwise enter, because retail location choice is endogenous. [Qian et al. \(2023\)](#) address this problem by developing a neural net that predicts potential locations that are not entered,

⁶ Additionally, most empirical work focuses on exclusive dealing in the upstream market, while this paper (along with [Lee \(2013\)](#) and [Ater \(2015\)](#))) study exclusive dealing in the downstream market. The closest paper is [Ater \(2015\)](#), which studies exclusive dealing in Israeli shopping malls, where landlords commit to renting to a single hamburger shop, and finds evidence consistent with foreclosure of rival competition.

and uses this to identify spillovers after the grocery store enters. This paper uses novel data on planned retail locations to construct the retailer choice set.

Third, this paper contributes to the literature on commercial real estate by studying how these exclusive deals change the market, and complimenting the literature on spillovers in shopping malls ([Moszkowski and Stackman \(2022\)](#), [Vitorino \(2012\)](#), [Stackman and Moszkowski \(2023\)](#)). This paper also builds on the literature of retailer competition in space going back to Hotelling (1929) and Salop (1979). The current literature has focused on coarse location, and often does not model the landlords' supply ([Bresnahan and Reiss \(1990\)](#), [Bresnahan and Reiss \(1991\)](#), [Seim \(2006\)](#), [Jia \(2008\)](#), [Caoui et al. \(2022\)](#), [Nishida \(2015\)](#)). This paper builds on the discrete-choice entry model of [Seim \(2006\)](#) and includes many of the important features of this literature: business stealing, fixed cost of entry, and estimating product demand. Relative to these papers, however, this paper is much more granular and models the commercial real estate market explicitly.

Additionally, this paper also contributes to and expands the policy discussion on non-competes. In the United States, the Federal Trade Commission issued a rule banning non-competes in labor ([Federal Trade Commission \(2023\)](#)), following a nascent but growing literature on non-competes in labor economics ([Balasubramanian et al. \(2020\)](#), [Krueger and Ashenfelter \(2022\)](#), [Lipsitz and Starr \(2022\)](#), [Shi \(2023\)](#), [Johnson et al. \(2023\)](#), [Young \(2024\)](#)). Exclusive dealing in commercial real estate is a type of non-compete in a different factor input – land – and may be subject to similar scrutiny from policymakers. This paper determines the welfare effects of exclusive dealing in land, and provides a model that can be used to estimate when exclusive dealing is procompetitive or anticompetitive in other settings.

Finally, this paper is the first to study restrictive covenants, this type of exclusive dealing contracts in commercial real estate. Legal scholarship on these exclusive dealing contracts focuses on the existence and details of the contracts ([Sturtevant \(1959\)](#), [Lundberg \(1973\)](#)), whether they encumber development ([Stubblefield \(2019\)](#)), and whether they are anti-competitive and cause food deserts in the grocery industry ([Ziff and Jiang \(2012\)](#), [Leslie \(2021\)](#), [Kang \(2022\)](#)). This paper answers this question.

2 Exclusive Dealing In Commercial Real Estate

Since this setting has not been studied, this section provides a background on these types of exclusive dealing contracts in commercial real estate. This section covers the motivation and policy implications of this type of exclusive dealing.

The exclusive deals studied in this paper are called restrictive covenants. These restrictive covenants contractually forbid specific retailers from operating at specific locations. Restrictive covenants are put in place to protect the business interests of one or both parties. For example, Figure 1 shows an excerpt from a Safeway⁷ restrictive covenant, which blocks the entry of retailers that sell similar or identical products to Safeway – retailers that sell food, drugs, and liquor – in a particular shopping center. As a result, these restrictions are important considerations for retailers choosing locations both because these contracts are an opportunity to limit the retailers' own competition, and because the set of locations they can consider may be limited by other retailers' restrictive covenants.

Figure 1: Restrictive Covenant in a Safeway Lease Memorandum

The Lease provides, in part, that no premises (nor any part thereof) in the Shopping Center other than the Premises, shall be (i) used or occupied as a retail supermarket, drug store and combination thereof, nor (ii) used for the sale of any of the following: (a) fish or meat (except in prepared form sold by a permitted restaurant operation); (b) liquor and other alcoholic beverages in package form, including, but not limited to, beer, wine and ale; (c) produce; (d) baked goods; (e) floral items; (f) any combination of food items sufficient to be commonly known as a convenience food store or department; and (g) items requiring dispensation by or through a pharmacy or requiring dispensation by or through a registered pharmacist.

Source: Cook County Record of Deeds, Document Number 0010276527. This figure is an example of a restrictive covenant. Here, Jewel Osco (whose parent company is Safeway) in Chicago at the intersection of Ashland and Roosevelt in 2001 limits the competitors in the shopping center. At this location, this portion of the lease memorandums shows Safeway is blocking grocers, drug stores, and liquor stores.

The content of the restrictive covenants vary greatly across contracts in terms of the retailers blocked, timing, and radius. The language of the exclusive dealing contracts vary from naming the retailers blocked from entering (as shown in Figure 13), to naming a narrow set of industries (as shown in Figure 14), to naming a broad set of industries (as shown in Figure 12). In each case, the contents of the exclusive dealing contract reflect – at least in part – the retailer' perceived competition. For example, Figure 12 shows an excerpt where Safeway prohibits grocers, drug stores, liquor stores, restaurants, gas stations, offices,

⁷A major grocery chain the United States.

educational facilities, thrift stores, and funeral homes: these blocked retailers are Safeway's direct competitors in the product market, retailers that compete for parking, and retailers that would bring a different aesthetic to the shopping center. The duration of the restriction varies greatly, from only valid while the retailer operates at the premises (as shown in Figure 13), to while the lease is in effect (as shown in Figure 12), to many years after the retailer has left the premises (as shown in Figure 14). The radius varies as well, from the exact premises of the store (as shown in Figure 14), to the shopping center (as shown in Figure 12), to specifying a radius (as shown in Figure 13, which specifies a 1 mile radius wherever the landlord or an affiliate owns property).

Restrictive covenants are often found in anchor store leases, or the leases of large retailers that drive food traffic to neighboring stores (these spillovers from the anchor retailer to other retailers are documented in [Relihan \(2022\)](#), [Knight \(2023\)](#), and [Qian et al. \(2023\)](#))⁸. Additionally, these stores sign long leases and rarely exit. When exit is costly, the restrictive covenant is one way for the anchor retailer to co-locate with stores that are complements and not with stores that cut into their profit. This is the motivation for the retailer to ensure that it does not suffer lower profits due to the stores that only enter because of its presence.

In turn, the landlord has incentives to provide the exclusive dealing contracts as well. Since anchor will drive foot traffic for the whole area the landlord owns (often a shopping center), the anchor tenant will attract co-locating tenants. Therefore, the landlord leases first to the anchor, and then the landlord leases to a set of co-locating stores near the anchor. Industry experts cite both commitment and information asymmetry as reasons why restrictive covenants exist. In the former case, tenants need a commitment device to ensure that the landlord will not bring competition into a nearby property. In the later case, the landlord does not know the tenant's profitability or the effect of competition on tenant profits. On one hand, the landlord needs to rent to co-locating stores, and it doesn't want the anchor retailer to leave, so there is an incentive to not rent to co-locating competitors. On the other hand, if the landlord limits which co-locating retailers can enter, it might be hard to find additional tenants. When setting prices, the landlord balances a higher probability of retailer entry and a higher price from the restrictive covenants with the lower probability of attracting a high-paying co-locating store. Explicitly pricing the exclusive deal mitigates some of the information asymmetry.

⁸In my data, 40% of grocery store trips also involve stops to another retailer (trip chains). When a national chain grocery store co-locates with another store, half of trips to this large grocer will also include a second store.

There is little policy on exclusive dealing in commercial real estate, and the provisions are largely litigated in court. In court, the exclusive deals are held up in some instances and struck down in others. The restrictive covenant usually holds when the provision is negotiated as a legitimate business interest⁹, and are struck down then they are deemed not in the public interest¹⁰. However, there is a growing concern that restrictive covenants cause food deserts by displacing and foreclosing upon rivals ([Leslie \(2021\)](#), [Kang \(2022\)](#), [Frerick \(2024\)](#)). In line with this thinking, several cities have attempted to limit exclusive dealing contracts¹¹. Given that food access is a priority for policymakers, it is important to understand how retailers sort into locations¹².

3 Data

This paper uses data from exclusive dealing contracts themselves, commercial real estate transactions, and consumer shopping transactions. In later sections, these data allow quantification of the effect of exclusives on the commercial real estate market and consumer welfare. Details on the data construction are found in the data construction appendix.

Exclusive dealing: To document the context of these exclusive dealing contracts, the paper scrapes little-known but publicly available county recorder pdfs, digitizes them, and extracts the parties (e.g. landlord and tenant), address, date, and details about the restrictive covenant from the document. The data comes from Cook County, Illinois, and spans 1980-present. The resulting dataset documents every single exclusive dealing contract in commercial real estate reported, as well as the location where the contract is in effect. The

⁹For an example, in *Child World, Inc. v. South Towne Centre* (1986) Child World, Inc wanted to vacate the property early but had signed a restrictive covenant limiting competitors, and the “restrictive provision was negotiated as an inducement to enter the lease and in return tenant agreed to 20 years of continuous operation.” As a result, the restrictive covenant held up in the court, and as a result Child World could not vacate the premises.

¹⁰For example, court struck down a restrictive covenant that forbid the operation of a grocery store on a vacant property (similar to the termination restriction in Figure 14), arguing that the covenant was not in the public interest and contributed to food deserts by limiting the availability of grocery stores (*Davidson Bros., Inc. v. D. Katz & Sons, Inc.* (1994)).

¹¹In 2005, [Chicago](#) attempted to ban restrictive covenants after a Dominick’s Finer Foods put a restrictive covenant forbidding future grocery entry on a property in what became a food desert. At first, [the Chicago City Council proposed an ordinance](#) to ban restrictive covenants completely. However, the proposal was met by opposition from the Chicagoland Chamber of Commerce and the Illinois Retail Merchants Association. After some negotiation, a measure was passed that bans restrictive covenants put in place on larger (greater than 7500 square feet) when a retailer leaves the community.

¹²See here for an example of how [local, state, and federal governments spend](#) resources on improving food access.

exclusive dealing contracts are between private parties and the parties are not required to report exclusive dealing contracts, but do so to prevent the contract from being broken. To the best of my knowledge, this is the first dataset that documents all the exclusive dealing contracts reported to a County Recorder Office in commercial real estate.

Potential Locations: Potential locations are gathered from Build Central, a startup that tracks new projects in commercial real estate, as well as the SNAP Retailer Locator Data and Infogroup. Build Central provides early-stage, often pre-permit project data and location analytics across retail and commercial real estate (CRE), hotels, multi-family and single-family residential, medical, and energy and mining. The data is used by firms who choose where to locate, and to understand where their competitors locate and will locate. The data includes projects from the proposal to completion, and includes failed projects as well. This data allows the set of all potential builds where the retailers might locate. The data starts in 2015 and goes till present day.

Retailer locations, entry and exit: Store locations, entry, and exit dates are compiled from the [Historical Supplemental Nutrition Assistance Program \(SNAP\) Retailer Locator Data](#) and from Infogroup's Historical Database. The SNAP Retailer Location Data spans 1990-2023 and records the date, location, and store name when each store enters and exits the SNAP database. The Infogroup historical data provides a historical, yearly directory information for U.S. companies, with address, store name, and NAICS/SIC codes.

Lease Characteristics: Lease characteristics are obtained from Compstak. – such as – rent, square footage, tenant industry, location, and duration of the lease. CompStak gathers its data from a network of brokers who report lease characteristics for the properties they rent to in exchange for characteristics of the leases for nearby properties, so that they can get a sense for the other prices and lease characteristics in the market. As a result, the data is selected from the group of brokers: to ensure that the data is representative, I compare moments in the data to industry reports on rents and lease characteristics.

Panel on consumer purchases: Numerator data is a omni-channel consumer panel data available through the Kilts Center at the University of Chicago. The panel spans 2017-2022 and covers a broad range of consumer purchases as a broad range of stores, including grocery, discount, dollar, convenience, and other stores. Importantly, on the retailer side, Numerator provides both store identity and store location (longitude and latitude), retailer, and store identifier. On the consumer side, Numerator provides the household zip code as well as household demographics. Information on the consumer panel includes purchase amount,

product quantity, product descriptions, brand description, day and time of purchase. Since day and time of purchase is available, this data is used to compute when households trips to multiple stores. We consider a trip to be all of the stores a household shops at in person on the same day, and that the household takes the shortest route from home, to each store, and back (a trip is a unit of incurring a single distance cost). On a trip, a consumer purchases a set of individual items – Item ID’s – that comprise the individual’s basket of purchases for that trip. Numerator data classifies items in to several categories, broader and broader categories. Figure ?? shows these categories. For example, a single item “French’s Crispy Fried Jalapenos 5oz”, belongs to a larger category of goods that are similar to the consumer but might be quite different in terms of content. These categories are then grouped into larger departments, which are itself grouped into larger groceries.

4 Stylized Facts

This section first shows that exclusive dealing is prevalent in commercial real estate. Then, this section shows multiple effects consistent with the firms’ presumed goal of limiting competition: with exclusive dealing, lease prices are higher, stores have fewer competitors nearby, and consumer shopping patterns are different.

4.1 Exclusive Dealing is Common and Increasing

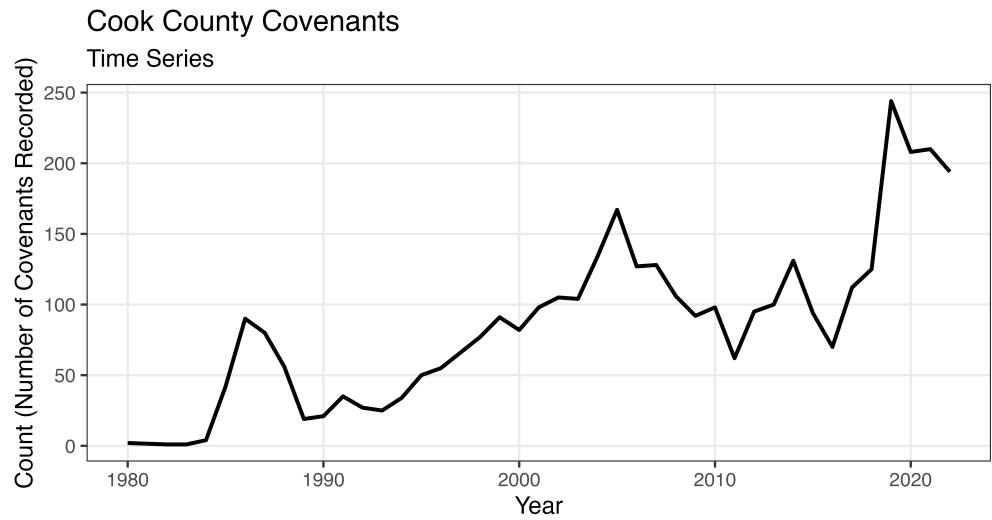
Figure 2 shows that the number of exclusive dealing contracts has grown steadily since the 1990s, peaking in 2005 and 2019.

Table 1 shows the prevalence of exclusive dealing contracts in the grocery sector in Chicago. Of the 371 contracts that forbid retailers from selling groceries, 154 are found on grocery store locations, and the rest are found in similar industries such as discount stores and drug stores. Table 7 lists the grocery chain retailers that operate in Chicago with at least one exclusive dealing contract: importantly, all of grocers with the highest market share use exclusive dealing contracts in their leases, and 30% of chain grocers have exclusive dealing contracts on premises. I conclude that exclusive dealing contracts are common, particularly in the leases of large national grocery chains.

Within grocery, the content of the contracts vary significantly. Figures ?? and ?? show

Beyond grocery, Figure 3 and Figure 15 show the retailers with the most number of contracts, and the fraction of the retailers' properties that are affected. These figures show the breadth of retailers that employ these contracts, and that the most common store types are grocery stores, drug stores, discount stores, and dollar stores, stores that sell similar products as their competitors. In principle, the contract can soften competition by differentiating the products in space, particularly when consumers shop close to home (this is the case in my data: consumers tend to shop close to home for groceries, often within .25 miles from home, as shown in Figure ??).

Figure 2: Time Series of Exclusive Dealing Contracts in Cook County IL



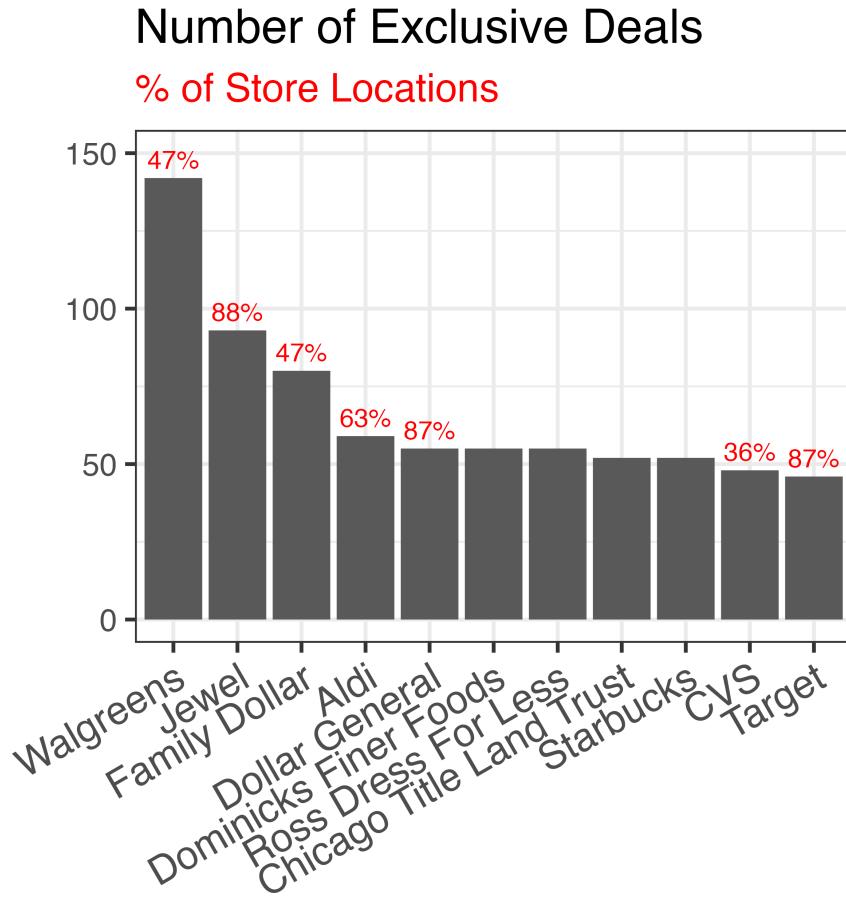
Source: Cook County Recorder Office. Figure plots a time series of exclusive dealing contracts recorded at the Cook County Recorder office, 1980-present.

Table 1: Prevalence of Exclusive Dealing in Grocery Industry

Exclusive Dealing Contracts	Block Grocers			On A Grocer Location		
	Total	Total	Fraction	Total	Total	Fraction
	371	154	0.42			
Grocery Chains	Total	with Grocery Covenants			Total	Fraction
<i>by Chain</i>	33	12	0.36			
<i>by Store</i>	491	113	0.23			

Notes: Table reports prevalence of exclusive dealing constructs amongst chains. Data is for Cook County, IL. Data comes from the Cook County office recorder.

Figure 3: Retailers with the Most Number of Exclusive Dealing Contracts



Source: Cook County Recorder Office. Figure plots the top retailers by exclusive dealing contracts use recorded at the Cook County Recorder office. Time span 1980-present.

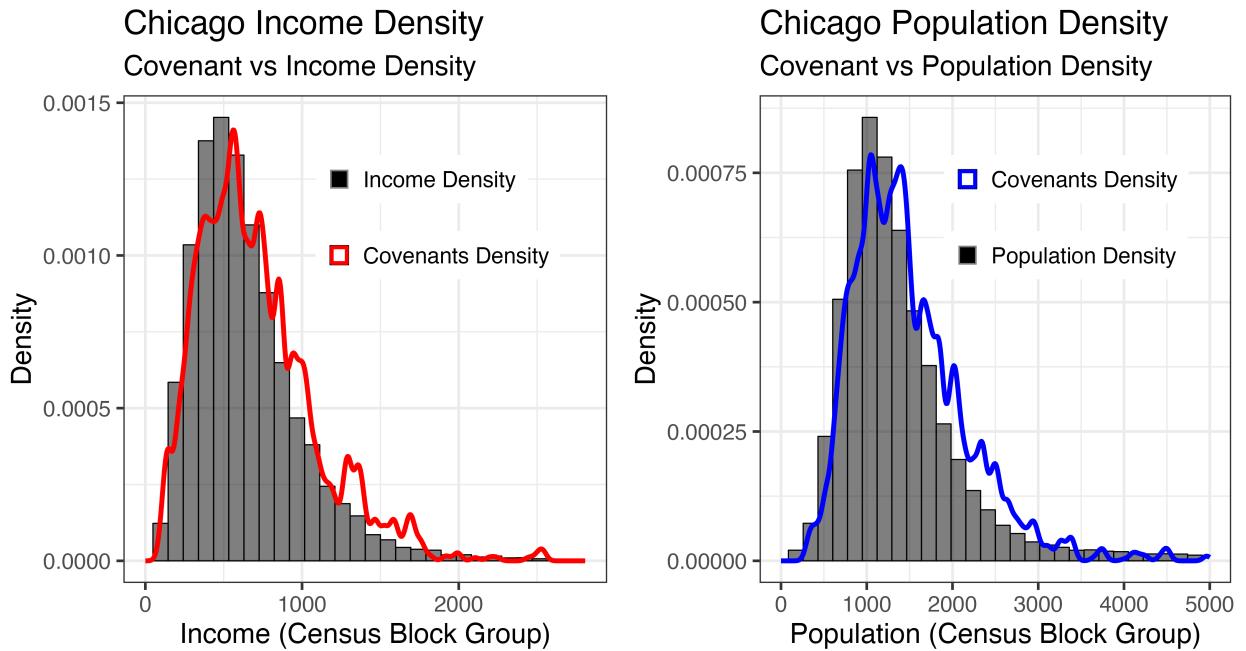
4.2 Neighborhood Demographics

Figure 4 shows that exclusive dealing contracts exist in poor and wealthy neighborhoods, as well as low-density and high-density population neighborhoods. The figure shows that exclusive dealing contracts are slightly more prevalent in high income census block groups, and are slightly more prevalent in population dense census block groups, but exist in both high and low income and sparse and dense retail environments. Table ?? regresses exclusive dealing contracts on demographic characteristics and that exclusive dealing contracts are not explained by neighborhood demographics or socioeconomic status.

$$\text{excl. deal}_{it} = \beta \mathbf{X}_{it} + \sigma_i + \lambda_t + \epsilon_{it}$$

where an exclusive dealing agreement i signed in year t is regressed on demographic factors in the census block group (median income, population density, travel time to work, ownership of homes, vacancy status, unemployment, share of the population by gender, share of the population by race), census block group group fixed effects, and year fixed effects.

Figure 4: Exclusive Dealing Contracts, Income and Population Density



Source: Cook County Recorder, ACS 2009- and Census Demographic Data 1980, 1990, 2000. Figure plots histograms of income density (left) and population density (right) in Cook County, Illinois, and overlays the density of exclusive dealing contracts.

4.3 Rental Prices

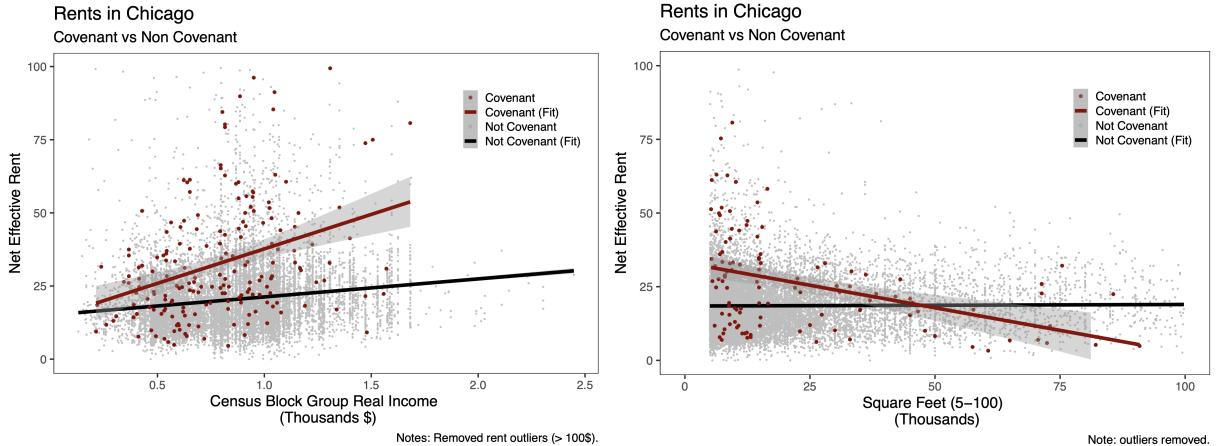
Prices are higher in leases with exclusive dealing contracts, even within retailer. This is shown by regressing rents on the presence of exclusive dealing, controlling for demographics (such as income), lease characteristics (such as store size), and property characteristics (such as building quality). Additionally, the specification includes location, time, and retailer fixed

effects.

$$\log y_{ijt} = \alpha_0 + \gamma \text{exclusive deal}_{ijt} + \sum_k \beta_k \log x_{kjt} + zip_j + year_t + retailer_i + \epsilon_{ijt}$$

Table ?? shows that prices per square foot per year are 20% higher in properties with exclusive dealing, conditional on covariates. Robustness checks which vary the covariates included report estimates between 20% and 40%. The regressions indicates that the average lease prices would be 4\$ higher per square foot per year for an exclusive dealing; for a typical grocery store, this translates to an additional 120,0000\$ per year for a lease with such a contract, or approximately .24% of average annual revenue.¹³

Figure 5: Rental Prices as a Function of Neighborhood Income, Store Size, and Exclusive Dealing



Source: Cook County Recorder, ACS 2009-2023 and Census Demographic Data 1980, 1990, 2000, and CompStak lease characteristics data. Figure net effective rents in Cook County as a function of exclusive dealing status (covenant), census block group income, and size of the space. Net effective rent is the rent per square foot per year, averaged over the course of the lease.

¹³Typical grocery stores in Chicago average 30,000 square feet and make around 50 million dollars in revenue each year.

Figure 5 shows how prices with and without exclusive dealing vary as a function of neighborhood rent and store size, without controlling for covariates. Exclusive dealing contracts are more expensive for all neighborhoods but particularly more expensive in high-income neighborhoods. These findings are consistent with higher retailer demand in higher income neighborhoods, with landlords extracting higher prices for exclusive dealing. The results are also consistent with higher co-locating retailer demand in higher income neighborhoods, which means the landlord has to be compensated more to forgo profits from specific co-locating stores. Prices for exclusive dealing are inversely related to store size. When the store is small, retailers pay the highest premium for exclusive dealing (red line) relative to a similar-sized store without exclusive dealing (black line); when the store is very large, retailers with exclusive dealing contracts pay less than stores without them. This is likely due both to the fact that there are few retailers that can fill such a large store size, and because the large store likely drives demand for any nearby smaller stores; the large store entry may increase the landlords' profits in the co-locating store market. Grocery stores, which tend to be between 30,000 and 60,000 square feet around the region where prices are roughly equivalent.

4.4 Density of Nearby Competitors

Retailers with exclusive dealing contracts have fewer competitors surround them (0-.2 mi), but more competitors farther away. This is consistent with the firms' presumed goal of limiting competition, and consistent with the idea that exclusive dealing only slightly displaces competitors. Figure 6 shows a regression coefficients of the number of stores in the vicinity on whether or not there is a contract on that store.

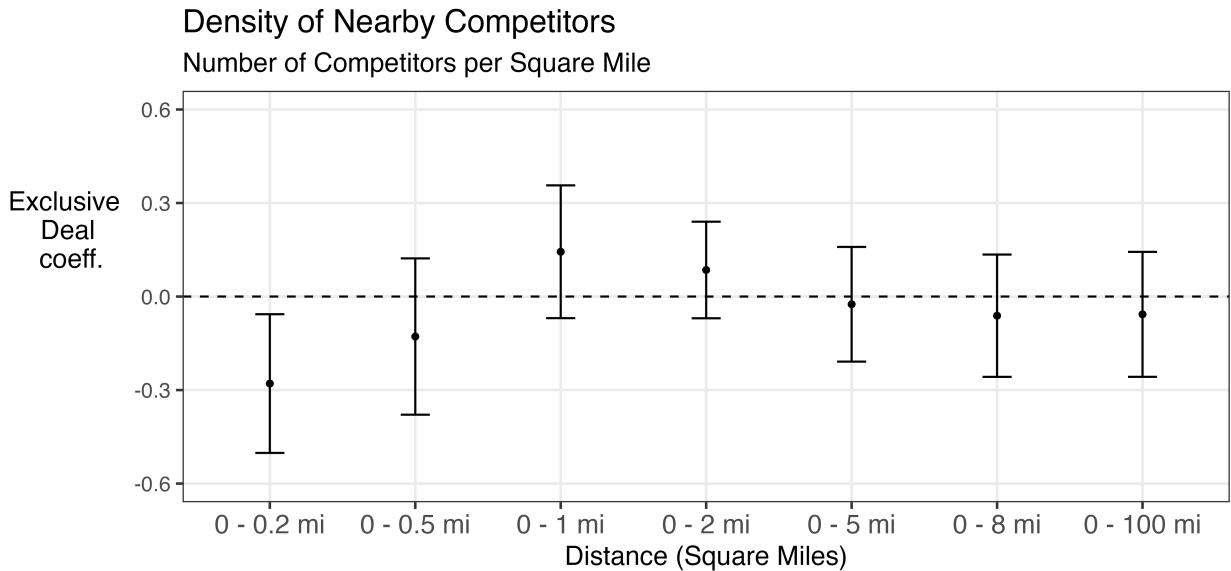
$$num\ stores_{r(i)t} = \beta_{\text{exclusive deal}_i} + \sigma_i + \lambda_t + retailer_i + \epsilon_{it}$$

where $num\ stores_{r(i)t}$ are the number of dollar, grocery, drug, and big box stores surrounding a grocery or big box store (excluding the store itself) in a radius $r(i)$ in a year t , exclusive deal_i indicates the presence of an exclusive dealing contract benefiting the property i , and σ_i , λ_t , and $retailer_i$ include zip, time, and retailer fixed effects.

The results show that in the closest vicinity to the property – 0 to .2 mi –, grocery stores with exclusive dealing contracts are surrounded by fewer competitors. This 0-.2 mile radius

is important both because it is the radius of a typical shopping mall and also because it is the radius at which the trip chaining literature has documented spillovers across stores ([Qian et al. \(2023\)](#), [Knight \(2023\)](#)). At a larger radius, expanding to 0-1 mile, the effect goes away: there are similar number of competitors. As a result, between .2 and 1 mile, the result reverses and there are more competitors surrounding stores with exclusive dealing contracts. These results are consistent with the hypothesis that the covenant restrict competitions by pushing competitors farther away. At a large radius, there is no difference between stores with and stores without exclusive dealing contracts. Table 6 and Table 12 and Table 11 show the full specification results in the appendix.

Figure 6: Density of Nearby Competitors



Notes: Figure reports coefficients and 95% confidence interval from regression of number of competitors per square mile on whether or not the store has an exclusive deal, with year, zip5, and retailer fixed effects. We only use grocery chains and big box stores. Competitors are defined as grocery, big box, and drug stores. Data is based on the exclusive deal data from the Cook County recorder office and the retailer location, entry, and exit comes from the SNAP data.

4.5 Event Study with Consumer Expenditures

In this section I present evidence that consumers are affected by exclusive dealing contracts. Specifically, I show that consumers reduce grocery purchases and switch to the dollar store following a grocery store exit only when an exclusive deal is present. To do so, I run the following event study regression where

$$Y_{it} = \Sigma_{k=-T_1}^{-2} \delta_k \times D_{ik} + \Sigma_{k=0}^{T_2} \delta_k \times D_{ik} + household_i + year_t + \epsilon_{it}$$

where the event is a chain grocery exit in household i zip in quarter t . The panel is balanced by restricting to household that appear in the year before and after the event, and to households that eventually experience a grocery exit; as a result, the control group is the not-yet-treated group and the event study is estimated using heterogeneity-robust estimators developed by [Callaway and Sant'Anna \(2021\)](#).

A common concern with the event study strategy is grocery store exit is related to other features of the local retail environment that would affect other retailers. To test for changing patterns before grocery store entry, I estimate the treatment effect in the years leading up to the grocery store exit. I find a precisely estimated flat pre-trend, and a significant trend break at the time of the exit. Similarly, if grocery stores respond to changes in local demand conditions, other grocery stores would likely enter or exit even before the grocery store enters. I estimate the effect of grocery exit on other grocery stores and find precisely estimated pretrends as well in Figure ???. Similarly, if households anticipated the grocery store exit, anticipation would likely induce a change in consumer outcomes before entry, but pre-trends in this event study are flat. The identifying assumption is that grocery stores in different zip codes that have a grocery exit in different times but will eventually lose a grocery store would have followed the same pattern regardless. One point in favor is that consumers do not observe and are not really aware of the covenants to begin with.

The outcomes are log grocery store expenditure and log dollar store expenditure, shown respectively in Figure 8. The results show consumers reduce grocery expenditures when the retailer leaving the premises had an exclusive dealing contract. Once the grocery store leaves, consumers substitute away from grocery stores and increase spending at dollar stores. The consumer spending patterns are persistent for a few years, and after a few years, the consumer expenditure recovers almost to pre-exit levels. Exploring the underlying market structure, I show that consumer expenditures – for grocery and dollar – return towards baseline once a new retailer enters the zip code. In contrast, consumers expenditure remain unchanged (before and after the grocer's exit) when the grocery store that exits does not have an exclusive dealing agreement with the landlord. Exploring the underlying market structure in Section ??, stores without exclusive dealing agreements that exit are replaced by grocers faster than stores with exclusive dealing agreements. The event study results

show not only that there is likely pass through from the commercial real estate market to the product market, but that the exclusive dealing contracts may have implications for consumer welfare.

Figure 7: Consumer Expenditure Following Grocery Exit.

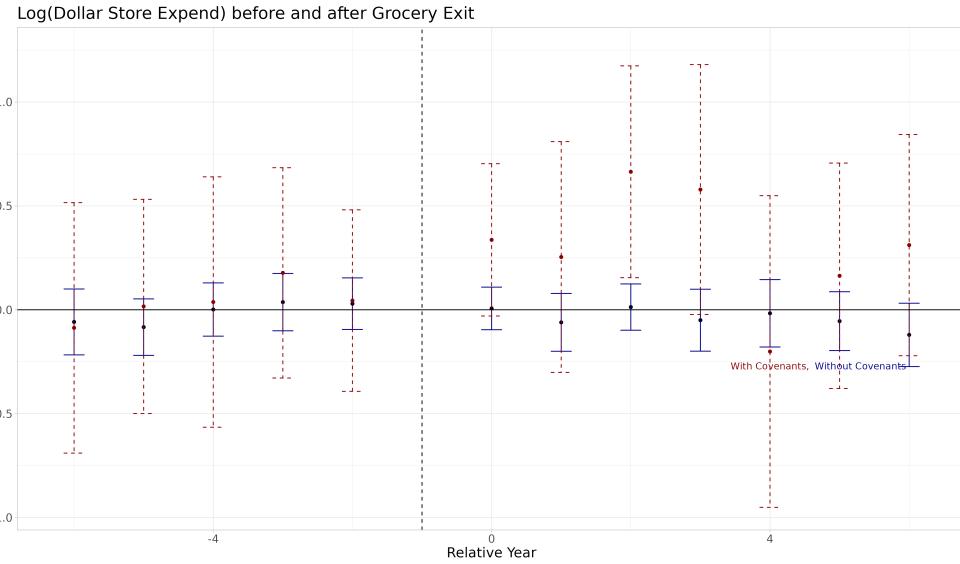
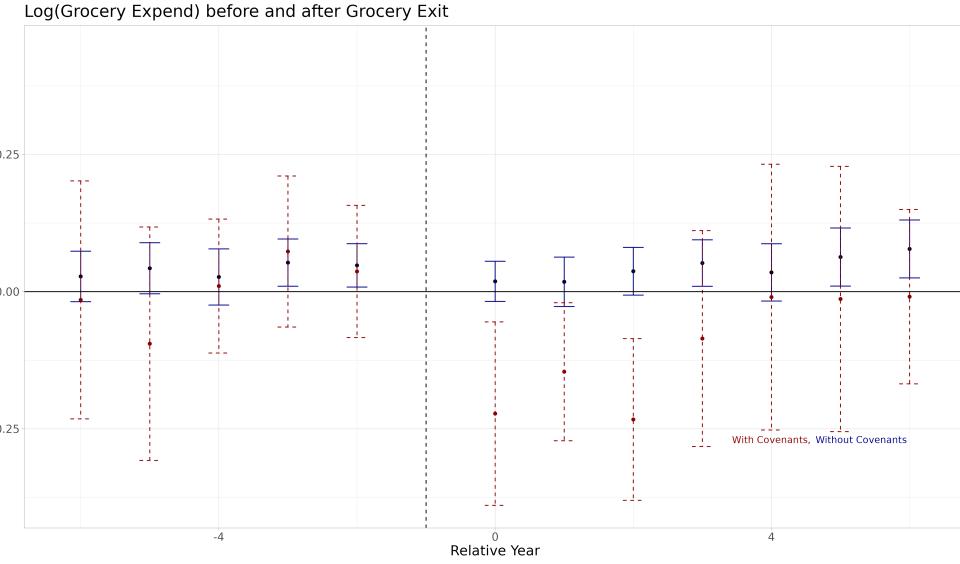


Figure 8: Consumer response (in terms of grocery expenditure) to grocery exit, for those with covenants and those without covenants.

5 Model

The stylized facts show correlation between exclusive dealing contracts, firm outcomes, and consumer outcomes; the model asses the equilibrium effects of exclusive dealing, and computes consumer welfare, firm profitability, in a counterfactual world where landlords and tenants cannot contract on exclusivity explicitly. Because the counterfactual affects all locations and all retailers, this comparison is ill-suited to reduced form analysis.

Timing: Timing in the model follows timing of grocery-anchored commercial real estate market.

First, (1) each landlord posts up to two prices per firm: a base price and a price for an exclusive contract. Landlord m offers retailer j contracts a which can be exclusive, common, or both, at rental price r_{jma} . The effect of the exclusive dealing contract is to forbid any competing firm from entering the landlord's land, as measured by the profitability estimated from the demand.

Then, (2) each retailer chooses locations and contracts. Entry is simultaneous and retailers form beliefs over the other retailer's strategies. The equilibrium is a Bayesian Nash: retailers take landlord's prices as given but form beliefs other retailer entry strategies.

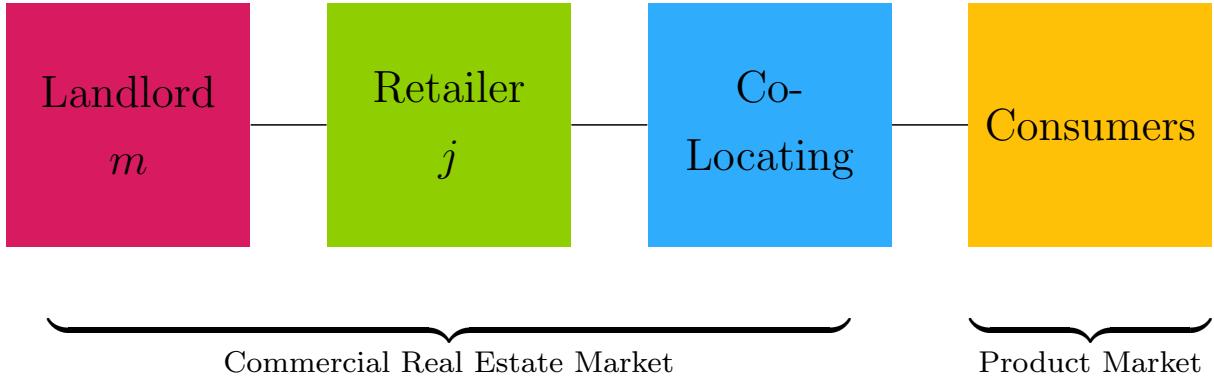
(3) The retailers attempt to enter. In the case of size or contract conflicts – due to exclusive dealing, the retailer paying the highest rent for each landlord enters.

(4) Given retailer entry, landlords set prices for co-locating firms and the co-locating firms enter. In this market, landlords set a single price and do not offer exclusive dealing contracts.

(5) Given entry decisions, retailers set prices in the product market, consumers shop, and the product market clears. The product market is modeled at the retailer level, because the exclusive dealing contracts are signed at the retailer level. Prices in the product market are depend on the locations of all retailers in the market.

The model is estimated in reverse order.

Figure 9: Model Timing



The commercial real estate market clears in two steps. First, the landlord rents to the retailer, next the landlord rents to co-locating stores. Given entry in the commercial real estate market, the retailers set prices in the product market, consumer shops for good, and the product market clears.

5.1 Consumer Demand for Retailers

Since exclusive dealing can distort retailer locations relative to households and other retailers, the product market model allows household choice to depend on retailer fixed effects, distance to the retailers, and distance between retailers¹⁴. In the model, consumers take locations and characteristics of retailers as given and choose where to shop. Consumers' choice of retailers depend on prices, total distances, retailer fixed effects and complementarities across retailers. The complementarity is modeled as a consumer preference to shop at multiple retailers in the same day – as a choice to multi-home (the model follows the complementarity model in Gentzkow (2007), and the discrete choice problem demand Berry et al. (1995), Berry et al. (2004), Bayer et al. (2007)). Consumer utility is

$$u_{ib}^m = -\alpha^m P_b^m + \gamma^m d_{ib} + \Gamma_b + \xi_b^m + \sum_{k,l} \sigma_{kl}^m X_{k(b)} y_{l(i)} + \epsilon_{ib} \quad (1)$$

where u_{ib}^m is the utility household i in income group m receives from shopping at the retailers

¹⁴The store fixed effect can be interpreted as store quality.

Table 2: Retailers Included in Demand Estimation

Retailer	Type
Jewel Osco (Safeway)	Supermarket
Mariano's (Kroger)	Supermarket
Whole Foods	Supermarket
Aldi	Specialty
Food 4 Less (Kroger)	Specialty
Trader Joe's (Aldi)	Specialty
Costco	Big Box
Meijer	Big Box
Sam's Club (Walmart)	Big Box
Target	Big Box
Walmart	Big Box
Drug	Drug Store
Dollar	Dollar Store
Liquor	Liquor
Other Food	Other Food
All Other	Outside Good

The retailers (and parent company, if retailers share a common parent company) included in the analysis are those with the largest market share and most frequent trips.

$b \in \mathcal{B}$ in market t , P_{bt}^m is the total price paid, d_{ib} is the total distance traveled, ξ_{bt} is market-level unobserved demand shock, σ_{kl}^m captures the effect of the interaction between household demographic characteristics $y_{l(i)}$ and retailer characteristics $X_{k(b)}$, and ϵ_{ib} is a household idiosyncratic preference for retailers b in market t . For example, ϵ_{ib} may represent daily preferences for a specific meal, which require a set of ingredients across stores.

The products, retailers listed in Table 2, are the retailers with the largest market share and most consumer trips: national chain grocers, discount stores, club stores, as well as categories of retailers such as drug stores, dollar stores, and liquor stores. The remaining stores comprise the outside group¹⁵.

Consumer preferences for prices, distance, retailers, and retailer complementarities determine the effects of exclusive dealing. As consumers shop for groups of retailers together, competition softens within each retail pair. Consumers that multi-home travel to multiple stores in the same trip, saving on distance costs¹⁶. With regard to exclusive dealing, as γ^m

¹⁵The outside group is interpreted as the most preferred of all of the other stores in the market, the same interpretation as in Cao et al. (2024)

¹⁶This model of multi-homing or trip chaining is modeled this way in Relihan (2022) and departs from

becomes more negative, the distaste for distance becomes more salient, exclusive dealing becomes more effective, and the value of exclusivity to the firm increases.

The complementarity term, Γ_b determines the retailer's profitability from keeping stores nearby. Relative to a counterfactual without multi-homing, complementarities can have three effects: first, (positive) complementarity can steal business from other retailers or the outside good and benefit the retailer. In this case, retailers have an incentive to co-locate as decreasing the distances between retailers increases the relative shares, as locating nearby decreases the total trip distance¹⁷. Second, positive complementarity can still result in an overall decrease in profits if multi-homing steals business from at least one retailer. In this case, the retailer has an incentive to locate far from the second retailer to decrease the utility from the multi-homing product. Third, substitute retailers have an incentive to locate as far from each other as possible to avoid business stealing. Since retailers choose locations and thus distances to other retailers, complementarities are moderated by distance.

Consumer preferences are heterogeneous across demographics and retailer characteristics, as captured by $\sum_{kl} \sigma_{kl} X_{k(b)y_{l(i)}}$. Each household has an idiosyncratic preference for a product (a group of stores), ϵ_{ib} , modeled by an additive product-specific Type 1 Extreme Value shock. The shock represents the day-of preference for a specific bundle, and represents an idiosyncratic preference for a specific set of retailers on that day, or idiosyncratic shocks that change the set of retailers shopped.

5.2 Product market supply

Prices are set after retailer entry has occurred and are static in each market. Retailers compete on prices and sell a composite good that is differentiated from other retailers goods by location, a store fixed effect, and exogenous demand shocks. A chain retailer chooses a

most grocery demand literature that assumes households pay the total trip costs to each retailer (for example [Thomassen et al. \(2017\)](#)).

¹⁷ Suppressing market indices for clarity, firm j 's share of the market is sum over all shares of bundles with firm j , $b \in j$, summed over the shares from all households in the market. complementarities are moderated by distance in the sense that as the distance between the stores changes, the preferences for consumers bundles change as well.

$$s_j = \underbrace{\sum_i \omega_i}_{\text{hhlds}} \underbrace{\sum_{j'=1}^J \frac{e^{-\alpha(P_j + P_{j'}) + \xi_{jj'} + \Gamma_{jj'} + \gamma d_{ijj'}} + \sum \sigma X_{jj'} y_i}{1 + \sum_{j,j'} e^{-\alpha(P_j + P_{j'}) + \xi_{jj'} + \Gamma_{jj'} + \gamma d_{ijj'}} + \sum \sigma X_{jj'} y_i}}_{\substack{\text{share bundle } jj' \text{ for hh } i \\ j' \text{ index is dropped for } j'=j}} \quad (2)$$

price for all of its retailer locations in market j each week, and sets separate prices for each income group m . An independent retailer sets a price for its individual retailer for each income group as well:

$$\max_{p_j^m} \sum_m s_j^m (p_j^m - mc_j) \quad (3)$$

Consumers only shop at the closest location to home. When a retailer adds location it increases shares (and thus profits) by lowering distances a customer travels to get to the closest bundle, but new locations cannibalize existing locations because each retailer location generates less revenue, and attracts fewer customers, and has to pay rent and fixed costs of entry.

Then retailers set prices according to

$$p_{jt}^m = mc_{jt} + \left[\frac{\partial s_{jt}^m}{\partial p_{jt}^m} \right]^{-1} s_{jt}^m - \frac{\partial s_{jt}^m}{\partial p_{jt}^m} \quad (4)$$

5.3 Co-Locating Retailer Entry

The landlord leases to co-locating stores before the product market clears but after the landlord had leased to the retailer. Once the landlords rent to the retailers, the landlords with empty locations rent to the small retailers (the co-locating stores). The co-locating retailers are the products in the demand estimation that aren't considered anchor retailers: other food, drug stores, liquor stores, dollar stores, and other stores. The co-locating store market differs from the retailer market in three main ways: landlords set a single price for all tenants, there is no exclusive dealing, and when multiple retailers approach, entry is determined at random. These assumptions reflect the great number of locations retailers of this size can enter in a market like Chicago. Each co-locating retailer k 's location choice is then determined by

$$\max_m E[\bar{\pi}_k] - r_m^{co} - F_m^{co} + \epsilon_{km}$$

The expected variable profits, $E[\pi_k^{var}]$, are determined by the parameters estimated in the product market, the distance to consumers, the rents, and the existing set of retailers (including if there is a retailer present at the location). In the model, consumers shop at the closest location.

The landlord sets prices in the co-locating market that balance the probability of entry, s_m with revenues given entry, $p_m^{co} - mc_m^{co}$. The landlord's profits from the co-locating market are

$$\max_{r^{co}} \underbrace{(s_m^{drug} + s_m^{dollar} + s_m^{other food} + s_m^{other})}_{\pi_l^{co}} (p_m^{co} - mc_m^{co})$$

When the landlord enters into an exclusive dealing contract with a retailer, the landlord sets the share from the industry that is blocked to zero; however, the landlord can always rent to the “other” firm. When determining prices for an exclusive dealing contract, the landlord balances the expected gains from the retailer market with the expected losses from the co-locating tenant market.

5.4 Retailer Entry

In the commercial real estate market, landlords set prices for contracts and then retailers simultaneously choose where to enter and whether to enter with an exclusive contract or not. When choosing locations, retailers consider rental prices, fixed costs of entry, and the expected variable profits from the product market. A retailer j chooses across landlords m and contracts a to maximize

$$\max_{m,a} E[\bar{\pi}_{jm}(\mathbf{l}_{-j})] - \bar{\mathbb{P}}_{mja}(r_{jma} + F_m - \theta_{ja} + \epsilon_{jm}) + (1 - \bar{\mathbb{P}}_{mja})\epsilon_{j0} \quad (5)$$

where $E[\bar{\pi}_j(\mathbf{l}_{-j})]$ are the expected variable profits in the product market, \mathbf{l}_{-j} are the other retailers entry strategies, $\bar{\mathbb{P}}_{mja}$ is the probability the retailer wins entry given that it tries to enter, F_m is the fixed cost of entry, θ_{ja} is the additional profitability from exclusivity (or the profit loss from operating non-exclusively), ϵ_{jm} is the idiosyncratic profitability at the

location, and ϵ_{j0} is the expected profitability if the retailer doesn't win entry.

That is, the retailer makes a discrete choice which depends on expectation over other retailers' choice. Specifically, variable profits depend on the existing locations and entry decisions of other retailers $E[\bar{\pi}_j(\mathbf{l}_{-j})] = \prod_{j' \neq j, a'} \left(\sum_{l'_{j'}} \right) \mathbb{P}_{l'j'a'} \pi_{jm}(l_{-j})$. which affect the retailer both through competition in the product market and through possibility that the winner may not win entry.

The retailer doesn't know other retailers' profitability

The exclusive deal gives the tenant direct control over the co-locating tenants in the vicinity and the retailers in the vicinity

The resulting Bayesian Nash equilibrium

Importantly, the landlords do not know the retailer's idiosyncratic profitability match, ϵ_{jm} or the extent to which retailer profitability is affected by competition, θ_{ja} . for information is **asymmetric** and ϵ_{jm} and θ_{ja} private information to the retailer, but the distributions are known to the landlords and other retailers: $\theta_{ja} \sim N(\mu_\theta, \sigma_\theta^2)$, $\epsilon_{jm} \sim N(0, 1)$. The ϵ_{jm} captures the idiosyncratic profitability of the space for that retailer, for example, the layout or square footage might be particularly profitable for that specific retailer. Meanwhile, θ_{ja} captures the degree of sensitivity to nearby close competition. When the landlord has multiple properties – such as a shopping center –

Retailers observe potential locations, prices of a contract without exclusive dealing, and prices of a contract with exclusive dealing. as well as expected variable demand – from the demand estimates in the product market – and form beliefs over where other retailers will enter and where co-locating stores will enter next.

Retailers choose entry strategy profiles to maximize expected profits.

First, different retailers approach landlords. If there are conflicts – if an exclusive dealing contract forbids another retailer from entering – the highest-paying retailer enters. The retailer's rents are thus observed only for that retailer entry. The likelihood then, of observing a set of outcomes is the sum of all the probabilities of the feasible initial choice that could lead to that outcome. For example, a retailer might be observed with no entries if it tries to entry a specific location but is not paying the highest rent or if it has chosen to not enter anywhere.

where $\bar{\mathbb{P}}_{mja}$ is the probability of retailer j winning entry to spot m with contract $a = \{C, E\}$ and \mathbb{P}_{mja} is the probability retailer j chooses spot m with contract a . Then, $E[\bar{\pi}_j(\mathbf{l}_j, \mathbb{P}_{-j})]$ are the expected variable profits in the product market, which depend on the probability of the other retailer's choices. Conditional on winning entry to location m with contract a , retailer j pays rents r_{jma} , fixed cost of entry F_m , and gains an additional benefit from exclusivity if it is in the contract, θ_{ja} . ϵ_{jm} is the idiosyncratic retailer-location match across all entered locations which is assumed to be private information to the retailer but the distribution is known and normally distributed, $\epsilon_{jm} \sim N(0, 1)$. Then

$$E[\pi_j(\mathbf{l}_j)] \sim N\left(\boldsymbol{\mu}^{E[\pi_j(\mathbf{l})]}, \boldsymbol{\Sigma}^{E[\pi_j(\mathbf{l})]}\right)$$

where $\boldsymbol{\mu}_{\mathbf{l}_j}^{E[\pi_j(\mathbf{l})]} = E[\bar{\pi}_j(\mathbf{l}_j)] - \sum_{m \in \mathbf{l}_j} \bar{\mathbb{P}}_{mja}(r_{jma} + F_m - \theta_{ja})$, $\boldsymbol{\Sigma}_{\mathbf{l}'_m}^{E[\pi_j(\mathbf{l})]} = \bar{\mathbb{P}}_{mja} \mathbf{1}\{m \in \mathbf{l}_j\}$. So the means, $\boldsymbol{\mu}$, are the expected probabilities from entering, independent of retailer idiosyncratic shocks. The each element of the variance-covariance matrix captures the probability of entry into each spot given that the retailer tries to enter.

The retailer will choose entry strategy if it provides the highest profitability, or if:

$$\begin{aligned} E[\bar{\pi}_j(\mathbf{l}_j)] - \sum_{m \in \mathbf{l}_j} \bar{\mathbb{P}}_{mja}(r_{jma} + F_m - \theta_{ja} + \epsilon_{jm}) > \\ \max_{\mathbf{l}'_j \neq \mathbf{l}_j} E[\bar{\pi}_j(\mathbf{l}'_j)] - \sum_{m \in \mathbf{l}'_j} \bar{\mathbb{P}}_{mja}(r_{jma} + F_m - \theta_{ja} + \epsilon_{jm}) \end{aligned}$$

where the probability that j chooses \mathbf{l}_j is

$$\mathbb{P}_{j\mathbf{l}_j} = 1 - \Phi\left(\boldsymbol{\mu}_j, \boldsymbol{\Sigma}_j\right) = 1 - \Phi\left(\mathbb{P}_{jma}, \bar{\mathbb{P}}_{jma}, \bar{\pi}_j, r_{jma}, F_m, \vec{\theta}\right)$$

The probabilities are explicitly written out in Section ??.

The probability that the tenant wins entry is

$$\bar{\mathbb{P}}_{jma} = 1 - \prod_i \left(\underbrace{\sum_{l_i: r_{ima_i} > r_{jma}} \mathbb{P}_{il_i}}_{\substack{\text{prob i chooses m} \\ \text{i enters before j}}} \right)$$

Intuitively, when then probability of entry doesn't change as a function of exclusive dealing, selecting an exclusive deal doesn't increase the entry probability given the choice to enter. In this case, the effect of the exclusive deal comes from foreclosing entry on the second firm. On the flip side, when there is no change in expected profits due to the entry of fringe stores, the exclusive deal has no effect on the change in profitability due to co-locating firm, and only serves as a barrier to entry for co-entering rivals. This would be the case, for example, when a co-locating competitor would never enter or when it is unprofitable for the co-locating store to enter near the incumbent.

5.5 Landlord problem

Each landlord m can set up to two prices – an exclusive and a baseline/common price for each firm j : r_{jma} . The landlord balances the probability of a tenant approaching with a higher revenues once the tenant approaches

$$\max_{r_{jma}} \sum_{j,a} \bar{\mathbb{P}}_{jma} \mathbb{P}_{jma} (r_{jma} - mc_m + \pi_m^2(a_j)) + \left(1 - \sum_{j,a} \bar{\mathbb{P}}_{jmat} \mathbb{P}_{jmat} \right) (u + \pi_m^2(O))$$

when the property is left vacant, the landlord pays additional costs u to cover the vacancy, and when the property is full the landlord pays marginal costs mc . Given the entry of the retailer, the landlord can expect to make profits $\pi_l^2(a_1)$ as a function of the retailers' action in the first period.

The landlord's profits from the fringe firms, $\pi_l^2(a_1)$ are determined by the probability that a fringe firm will enter at this price.

6 Identification, Estimation, and Estimates

6.1 Product Market

I assume that household stop in either one or two retailers in one day, because trips to more than two retailers comprise less than .05% of the data.

Preferences depend on the price of the bundle, P_{bt}^m . When a household shops at one retailer, it is simply the price of that retailer, when the household stops at multiple retailers, it is the sum of price of the good at each retailer.

$$P_{bt}^m = \sum_{j \in b} \log p_{jt}^m$$

Prices vary across markets t and retailers j , and we assume retailers set prices uniformly for all their retailers in the same city, and vary these prices weekly (evidence on uniform pricing comes from [DellaVigna and Gentzkow \(2019\)](#)). A market t is thus a city-week-year. In order to compare prices across different retailers, prices need to be aggregated from household purchases of individual barcodes to a retailer-level price, p_{jt} . I aggregate from individual barcode-level prices using a Stone price index following [Atkin et al. \(2018\)](#). Specifically, I regress expenditure-weighted log bar code prices on retailer fixed effects and bar code fixed effects, and use the retailer fixed effects as the retailer price. The price is thus the relative price of the retailer in the market, and the comparison across retailers is based on products common to all retailers in the market.¹⁸

Household utility also depends on unobserved market-level shocks that cannot modeled but are the same for all consumers, ξ_{bt} . These shocks can represent unobserved features of the market such as unobserved quality or time-varying retailer discounts. As a result, these shocks can be correlated with price. To address the endogeneity, price is instrumented for with a measure of average retailer price, following [Hausman et al. \(1994\)](#). The average retailer price exploits the idea that local demand shocks are likely uncorrelated with prices in different markets. Intuitively, local pricing decisions depend on both supply and demand factors, and the average price in different markets captures the supply component without

¹⁸Results are robust to different aggregation methods, and relative prices are similar when following alternative aggregation methods, such as following [Thomassen et al. \(2017\)](#) or when considering only key purchase categories.

capturing the idiosyncratic demand in a market.

To capture the importance of food access in the model, $\gamma^m d_{ib}$ is the utility (or distaste) from shopping at retailers farther away, controlling for the household's zip5 code or area.

The identifying assumption is that the zip5 represents an exogenous measure of neighborhood quality, and that conditional on the zip, household location choice is as-good-as-random.

In the baseline estimation, the higher order terms are the interaction between household income and distance to retailer, represented by $y_{l(i)}$ and retailer characteristics such as prices and bundle quality, represented by $x_{k(b)}$.

Demand parameters are estimated in two steps: first, the household-specific parameters are estimated with maximum likelihood, and then the market average parameters are estimated with instrumental variables (following [Bayer et al. \(2007\)](#), Berry). The household likelihood and The model is estimated with store information on latitude, longitude, address, retailer name, household information on demographics, and purchase information such as the bar codes scanned, and the price paid for each bar code, the stores traveled to and the time of day. This data allows us to directly measure multihoming. Household information contains demographics such as income, employment, marital status, number of children, etc.. Household location information is provided at the zip level, and the households are placed at the centroid of their likely census block group using Bayes rule, and comparing household demographics to ACS demographics. The household demand is estimate based on Numerator scanner data from 2017-2019 in Chicago.

Table 3: Selected Demand Estimates

Variable	Estimates		
	Income Group 1	Income Group 2	Income Group 3
log Price	-1.5693*** (0.1562)	-1.262*** (0.3248)	-1.001*** (0.2476)
log Dist (mi)	-2.22*** (0.3943)	-2.58*** (0.3909)	-3.03*** (0.5586)

Table 4: *Source* Numerator, Chicago, 2017-2022. Standard errors are constructed by bootstrapping a 1,000 times. Income Group 1 is the lowest income group, Income group two is the middle income group, and income group 3 is the high-income group.

Results from the estimation show disutility for prices and distance, and twice the disutility of distance as compared to price. For each additional 1% price increase, the average household that travels .5 miles to a store is willing to drive an additional .3 miles to get the same price. The complementarity terms are also illuminating: Jewel (also known as Safeway or Star Market), Aldi, Trader Joe's are all grocery stores. Aldi and Trader Joe's are owned by the same company, and it is unsurprising that they are located in a way that there is neither competition nor complementarities between them: Aldi targets low income neighborhoods, Trader Joe targets high income neighborhoods. Meanwhile, there is competition between Jewel and Trader Joe and Jewel and Aldi, as Jewel locates in both high income and low income neighborhoods, and they provide similar products. Jewel, which contains a pharmacy

inside and provides all the same products as a typical drug store competes strongly with drug stores. Aldi, meanwhile, which does not contain a pharmacy inside, is viewed as complementary by consumers to the drug store. Indeed, Jewel stores often have covenants against pharmacies and drug stores, and Aldi stores typically do not.

Table 5: Select Demand Estimates from Cross-Store Complementarities

Variable	Jewel	Aldi	Trader Joe's	Drug	Dollar	Liquor
Jewel		-1.2*	-0.1	-2.3*	.8*	.4
Aldi	-1.2*		.5	1.2*	-1.4*	-.6
Trader Joe's	-.1	.5		-.5	.1	.9*
Drug	-2.3*	1.2*	-.5		-.3	.2
Dollar	.8*	-1.4*	.1	-.3		-1.7*
Liquor	.4	-.6	.9*	.2	-1.7*	

Table 6: *Source:* Numerator. Table shows estimates for cross store complementarities relative to the outside good. Current standard errors mark as significant at the 5% level

The demand estimates are correlated with the exclusive dealing contracts: that is the exclusive dealing contracts are predictive of which stores are more substitutes. Figure 10 shows each retailer's exclusive dealing contracts. The higher the bar, the greater the fraction of stores that block that industry. Substitutes, as predicted by the demand estimates – such as Jewel Osco (Safeway) and Grocery, Jewel Osco (Safeway) and drug stores, Whole Foods and grocery, and Aldi and grocery – are also stores that are most blocked by the exclusive dealing contracts. One exception is Aldi and drug stores, wherein Aldi exclusive dealing contracts stat that they block food sales at drug stores: they are not excluding the drug stores per se', but the food portion of the drug stores. Despite being (relative) complements, Jewel Osco (Safeway) still blocks dollar stores in a quarter of cases. This is likely because Jewel Osco likely drives the majority of demand for the Jewel Osco-Dollar Store bundle, and Jewel Osco would be more profitable operating alone.

Figure 10: Exclusive Dealing Contracts and Demand Estimate Complementarities



Figure 11: *Source:* Numerator and Cook County Recorder of deeds. Figure overlays blocking patterns from exclusive dealing contract and product demand estimates.

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A Example of Exclusive Dealing Contracts

Figure 12: Restrictive Covenant in a Safeway Lease Memorandum

2. Restrictions. By virtue of the Lease, Tenant, its subtenants, invitees, customers and employees and parties holding possessory rights in the Premises shall have, and are hereby granted, the use in common with Landlord and other tenants of Landlord and their respective invitees, customers, employees and parties holding possessory rights in the Shopping Center, of "Building Areas" and those portions of Building Areas upon which buildings are not constructed (all of which are referred to as the "Common Areas"). "Building Areas" shall refer to the areas designated as "Jewel/Osco", "Retail Bld'g A", Retail Bld'g B", "Retail Bld'g C" and "Bank" on the Site Plan. The Common Areas are required by the terms of the Lease to be devoted to the purposes of driving and parking motor vehicles, loading and unloading of motor vehicles and vehicular and pedestrian ingress and egress to and from and within the Shopping Center. Additional rights are granted by the Lease to such parties in connection with the construction and maintenance of utility facilities necessary to the Shopping Center. All buildings constructed in the Shopping Center shall be located wholly within the "Building Areas". Additional use and development restrictions and maintenance, development and performance obligations with regard to the Premises and the Shopping Center are specified in the Lease.

In addition to other restrictions and obligations set forth in the Lease, the Lease provides that the types of uses permitted in the Shopping Center shall be of a retail and/or commercial nature found in shopping centers of a similar size and quality in the metropolitan marketing area in which the Shopping Center is located.

The Lease provides, in part, that no premises (nor any part thereof) in the Shopping Center other than the Premises, shall be (i) used or occupied as a retail supermarket, drug store and combination thereof, nor (ii) used for the sale of any of the following: (a) fish or meat (except in prepared form sold by a permitted restaurant operation); (b) liquor and other alcoholic beverages in package form, including, but not limited to, beer, wine and ale; (c) produce; (d) baked goods; (e) floral items; (f)any combination of food items sufficient to be commonly known as a convenience food store or department; and (g) items requiring dispensation by or through a pharmacy or requiring dispensation by or through a registered pharmacist.

In addition, except as expressly permitted in the Lease, none of the following uses shall be conducted in the Shopping Center: (a) offices; (b) funeral homes; (c) any production, manufacturing, industrial, or storage use of any kind or nature; (d) entertainment or recreational facilities; (e) training or educational facilities; (f) restaurants; (g) car washes, gasoline or service stations, or the displaying, repairing, renting, leasing, or sale of any motor vehicle, boat or trailer; (b) dry cleaner with on-premises cleaning; (i) any use which creates a nuisance or materially increases noise or the emission of dust, odor, smoke, gases, or materially increases fire, explosion or radioactive hazards in the Shopping Center; (i) any business with drive-up or drive-through lanes; *(k) second-hand or thrift stores, or flea markets; and (l) any use involving any Hazardous Material (as defined in the Lease).

Source: Cook County Record of Deeds, Document Number 0010276527. This figure is an example of a restrictive covenant. Here, Jewel Osco (parent company Safeway) in Chicago at the Intersection of Ashland and Roosevelt in 2001 limits the competitors in the shopping center. At this location, this portion of the lease memorandums shows Safeway is blocking (a) stores that sell similar products: grocers, drug stores, and liquor stores, (b) stores that also compete for food: restaurants and gas stations, (c) stores that compete for parking: offices, educational facilities, and (d) stores that would bring a different aesthetic to the shopping center: funeral homes, second-hand or thrift stores, stores that create a nuisance or materially increase noise.¹⁴

Figure 13: Restrictive Covenant in a Dollar General Lease Memorandum

4. So long as the Demised Premises is being operated as a Dollar General store, Landlord covenants and agrees not to lease, rent or occupy, or allow to be leased, rented or occupied, any property now or hereafter owned by Landlord or an affiliate of Landlord, or developed by Landlord or an affiliate of Landlord (for a third party), within a one (1) mile radius of the boundaries of the Demised Premises for the purpose of conducting business as, or for use as, a Family Dollar Store, Bill's Dollar Store, Fred's, Dollar Tree, Dollar Zone, Variety Wholesale, Ninety-Nine Cents Only, Deals, Dollar Bills, Bonus Dollar, Maxway, Super Ten, McCory's, McCory's Dollar, Planet Dollar, Big Lots, Odd Lots, Walgreens, CVS, Rite Aid, or Wal-Mart Supercenter.

This covenant shall run with the land and shall be binding upon Landlord and its affiliates and their respective successors, assigns and successors in title to the Demised Premises and to any such land owned, developed or acquired in the future within a one (1) mile radius. As of the Effective Date, Landlord does not own land within a one (1) mile radius of the Demised Premises. So long as the Demised Premises is being operated as a Dollar General store, Landlord agrees (for itself and its affiliates) not to accept any engagement as a developer for such purposes in violation of the foregoing restrictive covenants within such one (1) mile radius.

Source: Cook County Record of Deeds, Document Number 1532115028. This figure is an example of a restrictive covenant from a Dollar General Lease Memorandum in 2015, for a store at the intersection of 79th and Marquette Avenue. This restrictive covenant limits the landlord and affiliates from leasing to competitors within a mile radius for as long as the Dollar General is in operation on the premises. The restrictive covenant runs with the land, which means that it binds even if the landlord stays the same. The competitors are listed explicitly, and are largely other dollar stores, but also include discount stores and drug stores that sell similar snacks: Family Dollar Store, Bill's Dollar Store, Fred's, Dollar Tree, Dollar Zone, Variety Wholesale, Ninety-Nine Cents Only, Deals, Dollar Bills, Bonus Dollar, Maxway, Super Ten, McCory's Dollar, Planet Dollar, Big Lots, Odd Lots, Walgreens, CVS, Rite Aid, or Wal-Mart Supercenter.

Figure 14: Restrictive Covenant upon Termination of Dominick's Finer Foods Lease

USE RESTRICTION AGREEMENT
October

THIS USE RESTRICTION AGREEMENT ("Agreement") is dated as of September 1, 2015, and is made and entered into by and between RAMCO-GERSHENSON PROPERTIES, L.P., a Delaware limited partnership ("Landlord"), and DOMINICK'S FINER FOODS, LLC, a Delaware limited liability company ("Tenant").

C. On the date hereof, Tenant operates one or more grocery supermarkets within a radius of five (5) miles of the Property. The properties within such radius on which Tenant, any "Affiliate" (defined later) of Tenant, and/or its or their respective successors and assigns may in the future sell "Grocery Merchandise" (defined later), and/or "Prescription Pharmacy Merchandise" (defined later) are together called the "Benefited Properties." "Affiliate" of a named legal person or entity shall mean any legal person or entity that controls, is controlled by, or is under common control with the named legal person or entity.

D. Landlord acknowledges that (i) Tenant or its Affiliate has made a considerable investment in the Benefited Properties, (ii) Tenant or its Affiliate has invested its business reputation in the Benefited Properties, which reputation will be adversely affected if the sales volume of Tenant is negatively impacted, (iii) the addition of other businesses to the Property that may violate the "Restrictions" (defined later) will result in a reduction of Tenant's sales volume and thus impair the benefit of the bargain for which Tenant negotiated in entering into the Termination Agreement, and (iv) Tenant's agreement to terminate the Lease is predicated upon Landlord's acknowledgement of all of the foregoing, and Landlord's agreement to the terms of this Agreement.

1. USE RESTRICTION. Landlord agrees, on behalf of itself and its successors and assigns, that for the "Restriction Period" (defined later) (collectively the "Restriction Periods"), the Property will not be used in violation of the "Restrictions" (defined later). The "Restrictions" are the "Supermarket Restriction" (defined later) and the "Prescription Pharmacy Restriction" (defined later).

1.1. Supermarket Restriction. No portion of the Property shall be used or occupied for a general food market, supermarket, grocery store, meat market, fish market, fruit store, vegetable store, convenience store, or any combination of the foregoing ("Supermarket Restriction"). Notwithstanding the Supermarket Restriction, stores on the Property may devote up to, but not more than, the lesser of (i) five thousand (5,000) square feet of sales area (including aisle space adjacent thereto), or (ii) sales area (including aisle space adjacent thereto) of up to fifteen percent (15%) of the total square footage of the store, to the sale of Grocery Merchandise. "Grocery Merchandise" means, for off premises consumption, baked goods, fish, poultry or meat, liquor or other alcoholic beverages, fruits and vegetables, produce, floral items, pet food, greeting cards, photo processing services, health and beauty aids. Notwithstanding anything to the contrary contained herein, the Supermarket Restriction shall not apply to: (i) a restaurant-bakery, such as Panera or Atlanta Bread Company, of not more than 2,500 square feet in size; (ii) a retailer selling arts and craft supplies, including party supplies and dried floral arrangements; (iii) a beauty supply retailer that specializes in the sale of beauty and/or body care products, cosmetics, health care items, and/or beauty aids; (iv) a retailer selling greeting cards, giftware, stationary and/or keepsake ornaments; or (v) a retailer selling live animals as pets and pet food and related accessories.

Source: Cook County Record of Deeds, Document Number 1527955057. This figure is an excerpt from a Dominick's Finer Foods Lease Termination in 2015. In 1998, Safeway purchases Dominick's Finer Foods. In 2013, Safeway is in the process of closing all of Dominick's Finer Foods stores. Then, in 2015, Safeway acquires Jewel Osco. At this Dominick's location in 2015, Safeway and landlord agree to put a restrictive covenant on the property to prevent the entry of a grocery store for five years after Safeway leaves the premises ("no portion of the property shall be used as a grocery store"). The restrictive covenant specifies the motivation for the restrictive covenants: the tenant made investments to the property which benefited the landlord ("landlord acknowledges tenant has made considerable investment in the property"), and the tenant would stand to lose business if a competitor opened ("tenant operates a grocery store within 5 miles of the property").

B Descriptive Statistics

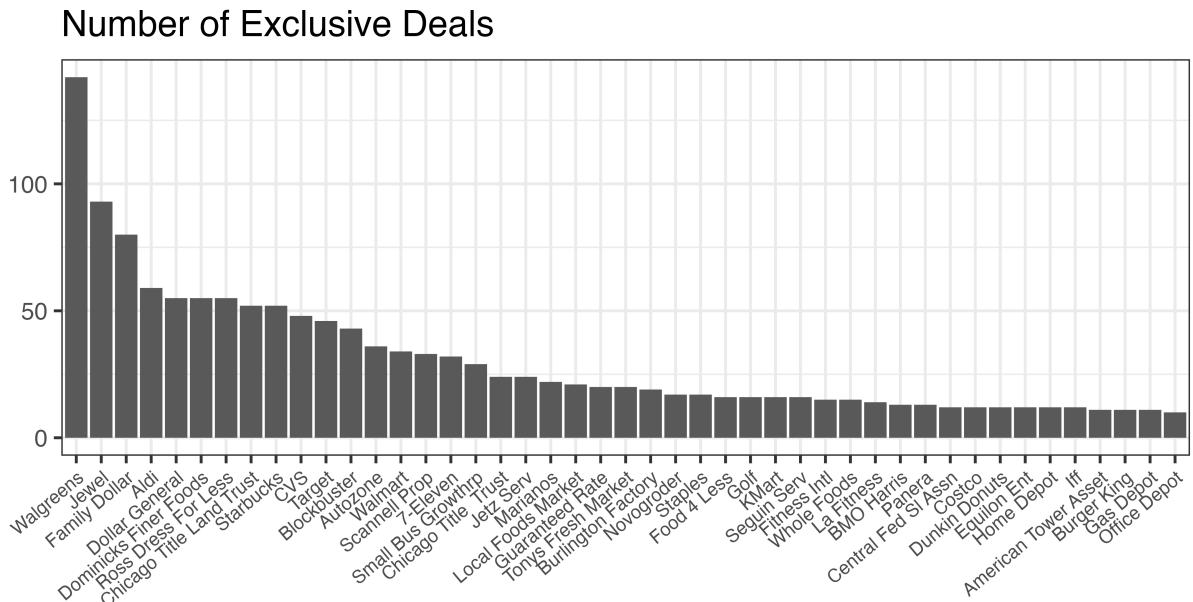
B.1 Grocery Sector

Table 7: Chicago Grocery Chains with Exclusive Dealing Contracts

Aldi	Jewel Osco (Safeway)	Trader Joe's
Delray Farms	Mariano's (Kroger)	Whole Foods
Dominicks Finer Foods (Safeway)	Meijer	
Food 4 Less (Kroger)	Save a Lot	
Gordon Food Service Store	Tony's Fresh Market	

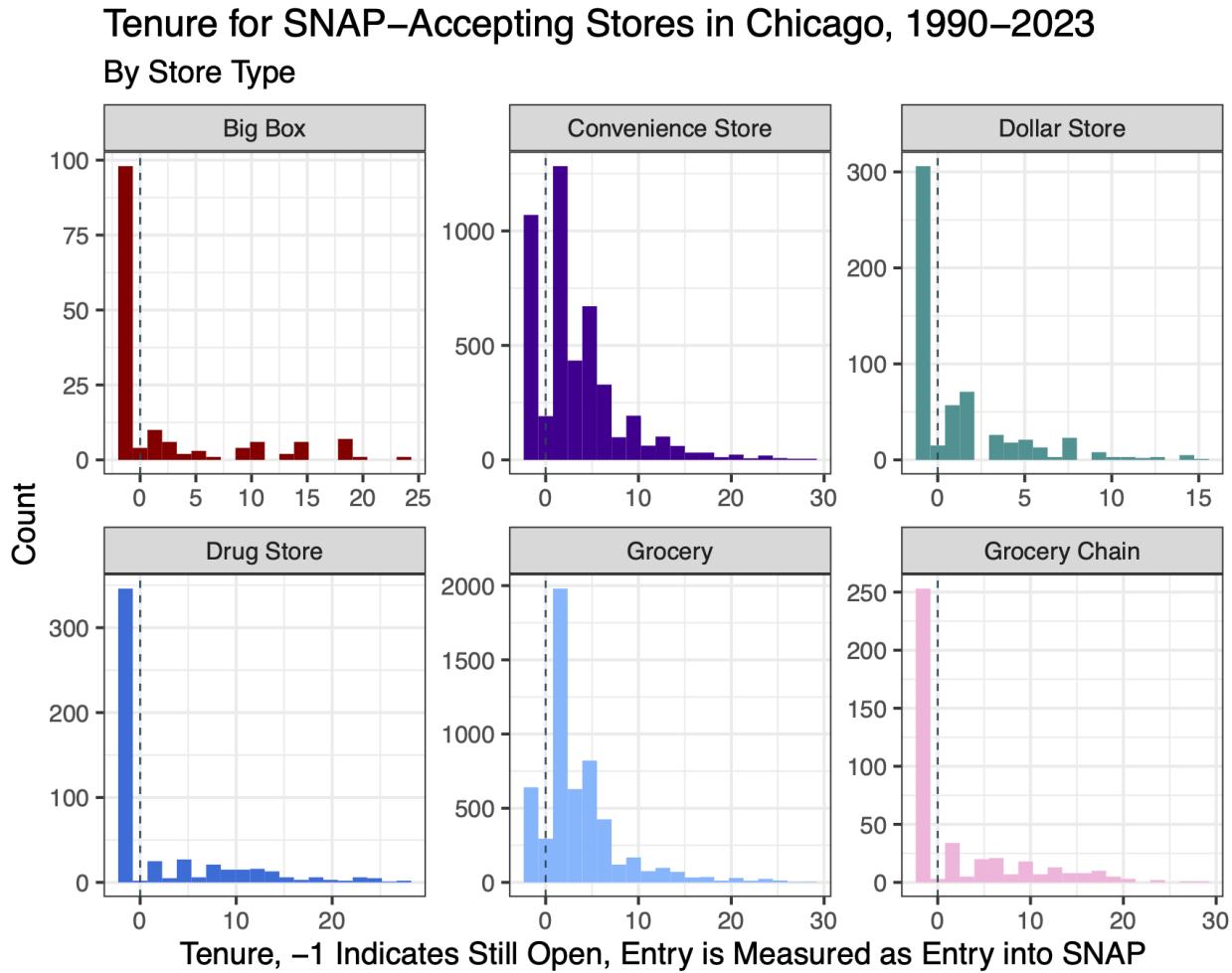
Notes: Table reports retailers in Chicago which have exclusive contracts. Data is for Cook County, IL. Data comes from the Cook County office recorder and the SNAP database.

Figure 15: Retailers with Exclusive Dealing Contracts



Source: Cook County Recorder Office. Figure plots the top retailers by exclusive dealing contracts use recorded at the Cook County Recorder office. Time span 1980-present.

Figure 16: Grocery Store Tenure: Age of the Retailer Location When it Closes



Source: SNAP Retailer Database. Figure plots the number of years each store stays open by store type. At $x = -1$ is the mass of stores that has not yet closed. The vast majority of chain grocery stores or big box stores do not close over the time period.

			<i>Num</i>	<i>Frac</i>
Total	→		196	
Own/Lease	→	Own	64	0.33
		Lease	131	0.67
Buy/Sell	→	Buy	8	0.21
		Sell	30	0.79
Type	→	Deed	28	0.19
		Agreement	27	0.19
		Memorandum	77	0.53
		Restriction	11	0.08
		Termination	2	0.01
Grocery Grantor	→	Yes	80	0.5
		No	72	0.54
Covenant Timing	→	Enter	94	0.48
		During	74	0.38
		Exit	13	0.07
		Not Grocery	15	0.08

Table 8: Covenants Observed in Chicago

Notes: Source: Cook County Recorder and SNAP. Subsetting to 196 grocery covenants in Chicago, and characterizing the restrictions. The majority of the covenants from leasing agreements between a landlord and a grocery store tenant, the majority of which are entry covenants (half of the covenants overall are entry covenants). Amongst the covenants for properties that are owned by the grocery store, 80% are established when the property is sold: after the grocery store presence is gone from that specific location (whether there was a grocery store to begin with is unclear). These covenants are found in a variety of legal documents: lease memoranda, deeds, agreements, restrictions, easements, and terminations.

Table 9: Covenants Restrictions Observed in Chicago

			<i>Num</i>	<i>Frac</i>
Total	→		196	
Text Length	→	Short	72	0.39
		Long	113	0.61
Radius	→	Property	104	0.58
		Adjacent Property	44	0.25
		Miles (median 0.5)	30	0.17
Duration After	→	Years (median 8)	62	0.46
		No	72	0.54
Covenant Timing	→	Enter	94	0.48
		During	74	0.38
		Exit	13	0.07
		Not Grocery	15	0.08

Notes: Source: Cook County Recorder. Detail of the extent to which the covenants might restrict competition. Covenants that are longer restrict more store types, and constitutes 60% of the observed covenants. Shorter covenants typically only block the same store type. Next, the covenant can bind at a variety of different radii: the property (typically the shopping center), within a certain mile radius (the median is .5), and the adjacent property. The vast majority of covenants bind at that specific shopping center. Finally, covenants can last even when a grocery store is not present at that location. The median duration is 8 years, and 62 explicitly detail a duration after exit.

Table 17 shows both entry dates and covenants for the grocery stores with covenants in Chicago. The figure shows both variation in chain covenants and entry stores, demonstrating significant variation in covenants within and across chains. In purple are entries without covenants, in other colors, are the date and time of openings and covenants.

What is the variation in covenants for each store by year?

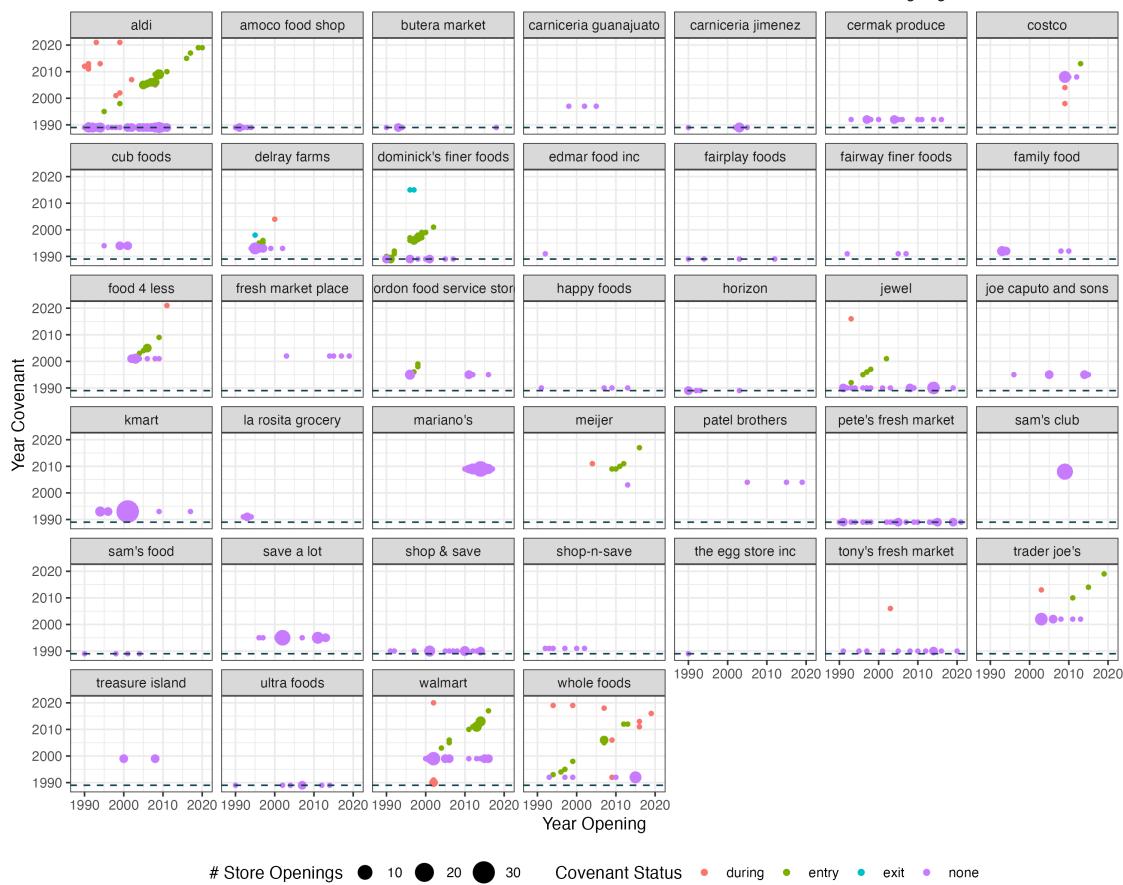


Figure 17: Notes: Figure reports the year of grocery chain entry (x axis) and the year of restrictions imposed associated with the property (y axis). Chains without restrictions are labeled in purple and assigned the “covenant year” as the year before grocery store entry. Data is based on cook county recorder data and SNAP grocery data.



Figure 18: *Notes:* Figure reports a map of present and past Chicago covenants, by type.

Do covenants co-move with business cycles? What sort of legal documents have covenants? To investigate this we can look at when covenants are placed on properties. In Figure 19 we find that covenants are enacted pretty uniformly over time, and are not obviously related to business cycles.

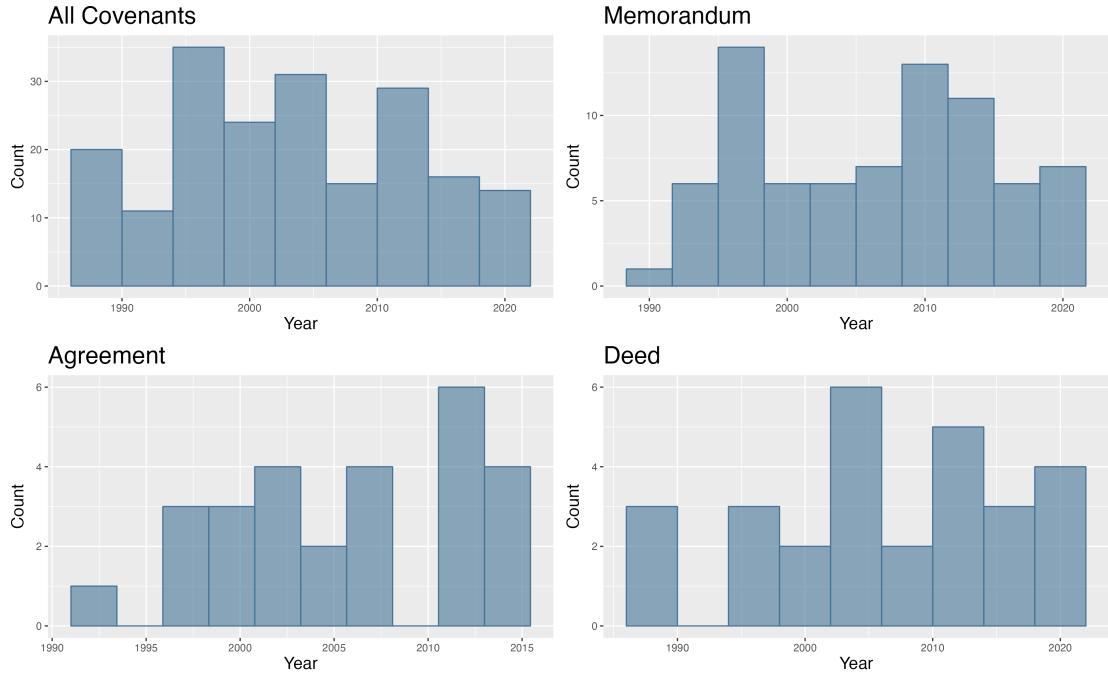


Figure 19: Number of covenant document types as a function of year in Chicago.

Can we abstract from moves? If firms move from location to location, this might be another important aspect of firm dynamics. In this case we should see exit followed by re-entry. Focusing on the Chicago chain stores, we do not see this much in the data in Figure 22. Maybe Pete's Fresh Market and Save a Lot (these stores do not put covenants on the property).

This plot also gives us a sense that there is good variation of entry and exit in the data, around a wide swath of chains

Contents of covenants

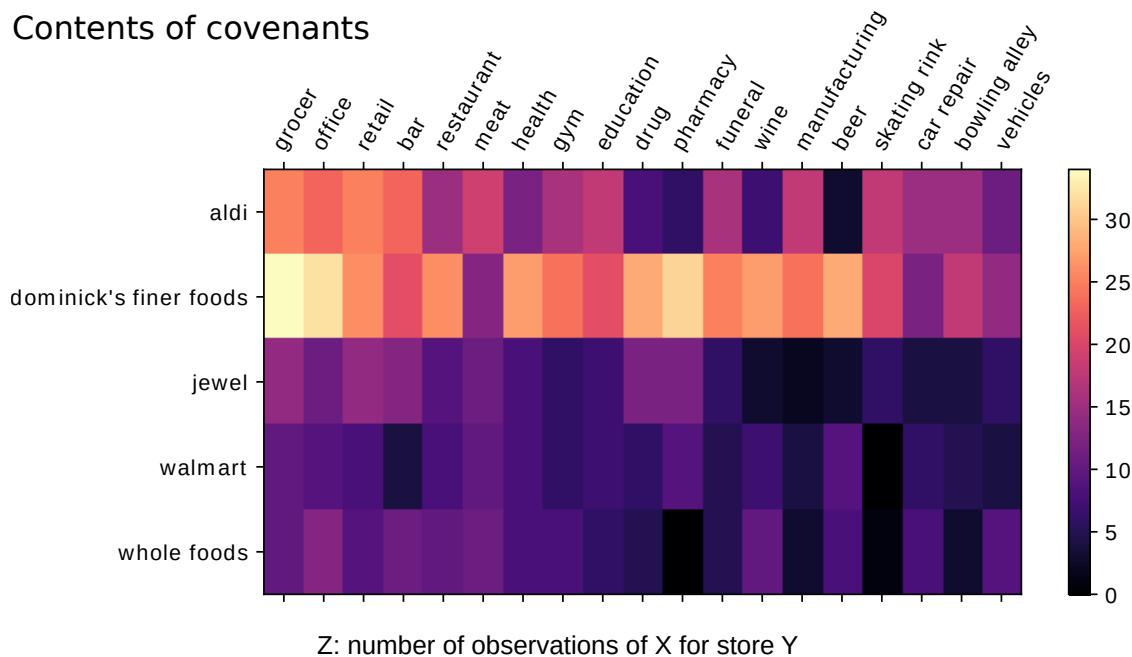


Figure 20: Time series of chain entry and exit in Chicago.

Contents of covenants, by retailer

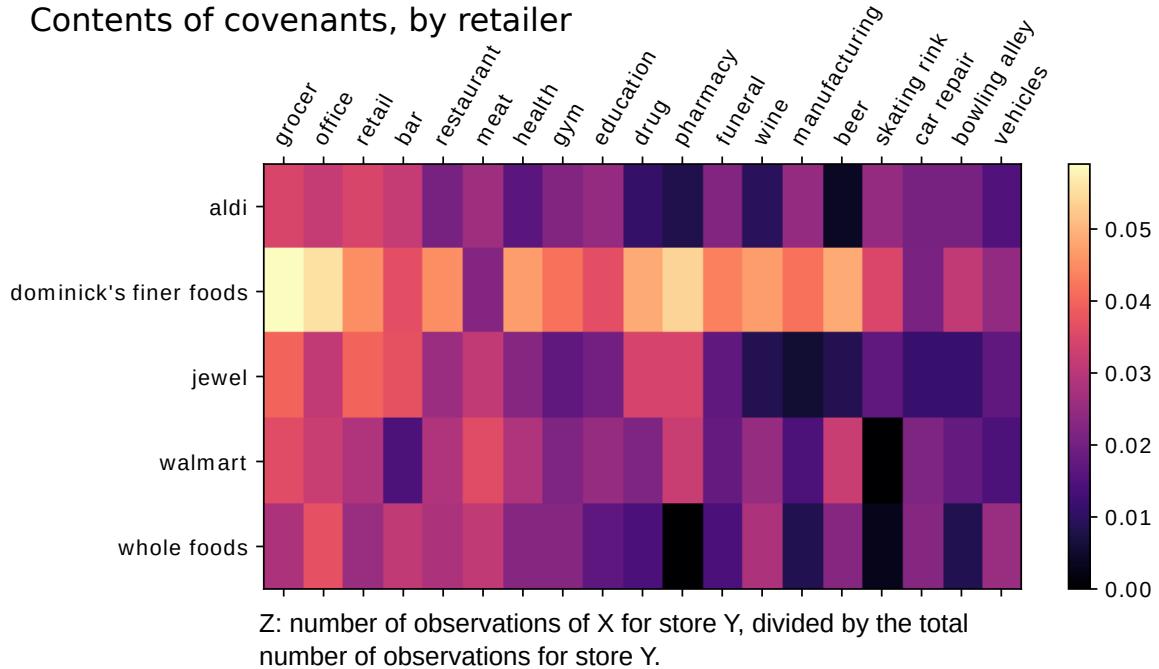


Figure 21: Time series of chain entry and exit in Chicago.

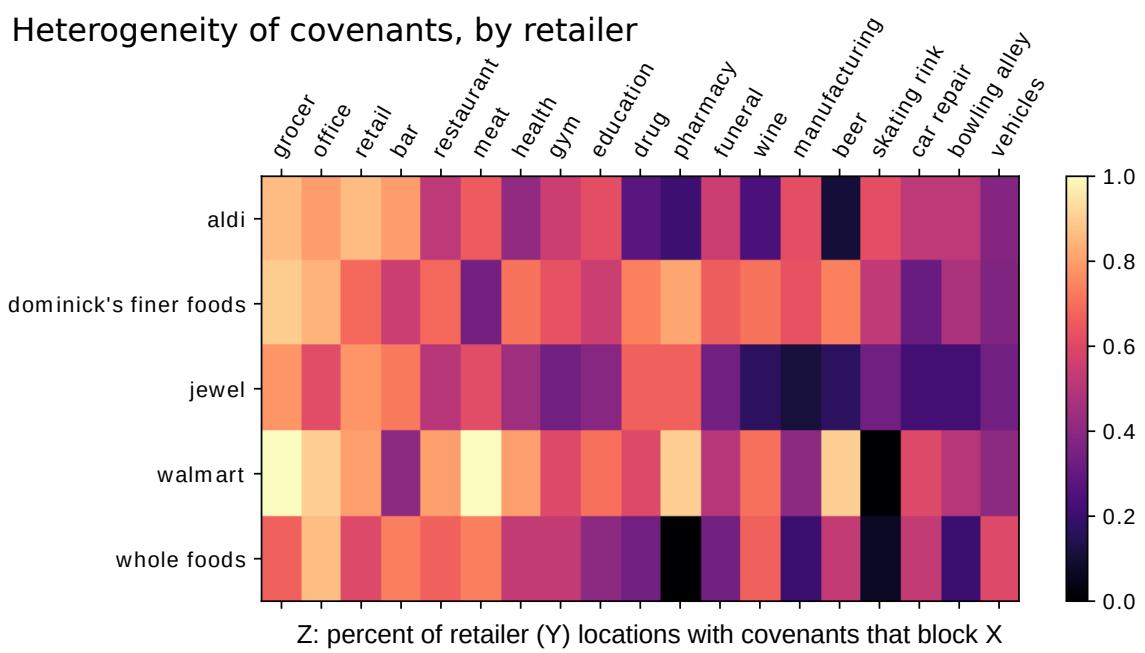


Figure 22: Time series of chain entry and exit in Chicago.

C Stylized Facts

C.1 Retail prices

	log(Net Effective Rent) OLS
1{Covenant}	0.3221*** (0.0811)
1{Grocer}	0.0458 (0.0533)
log(Transaction Sqft)	-0.0579*** (0.0072)
log(Lease Term)	0.0008 (0.0186)
log(Real Income)	-0.0823 (0.0480)
log(Pop Density)	0.0402* (0.0179)
Share Unemployed	0.1379* (0.0705)
Poverty	0.4996 (489,924.0)
Share Women	-1.331 (304,593.8)
Share Black	-0.4683 (0.4032)
Share White	0.3861 (0.3181)
Share Hispanic	0.3058* (0.1410)
Share Asian	0.4250 (0.3330)
Share Advanced Degree	0.1095 (2,976.9)
Share Travel Time to Work: < 30 mins	-0.0474 (4,862.6)
Share Travel Time to Work: 30-60 mins	5.43×10^{-7} (0.0037)
Housing Occupied	0.1405 (15,739.9)
1{Covenant} 1{Grocer}	-0.4604 (0.5900)

C.2 Density of Nearby Competitors

Table 11: Density of Nearby Competitors

	Log Density of Competitors (Count Per Square Mile)						
	0-.2 mi	0-.5 mi	0-1 mi	0-2 mi	0-5 mi	0-8 mi	All mi
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
midrule Exclusive Deals	-0.2792** (0.1135)	-0.1283 (0.1279)	0.1436 (0.1087)	0.0852 (0.0790)	-0.0248 (0.0938)	-0.0615 (0.1001)	-0.0571 (0.1023)
Observations	1,846	2,609	2,932	3,167	3,193	3,193	3,193
R ²	0.65702	0.65095	0.77363	0.83512	0.84039	0.82224	0.54131
zip5 fixed effects	✓	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓	✓	✓
Retailer fixed effects	✓	✓	✓	✓	✓	✓	✓

Notes: Table reports coefficients and 95% confidence interval from regression of number of competitors per square mile on whether or not the store has an exclusive deal, with year, zip5, and retailer fixed effects. We only use grocery chains and big box stores. Competitors are defined as grocery, big box, and drug stores. Data is based on the exclusive deal data from the Cook County recorder office and the retailer location, entry, and exit comes from the SNAP data.

Table 12: Density of Nearby Competitors

	log(density)						
	0-.2mi (1)	0-.5mi (2)	0-1mi (3)	0-2mi (4)	0-5mi (5)	0-8mi (6)	Allmi (7)
entry_covenants	-0.2787*** (0.0963)	0.0750 (0.1481)	0.1448 (0.1087)	0.0650 (0.0625)	0.0473 (0.0704)	0.0172 (0.0698)	0.0393 (0.0725)
Observations	1,846	2,609	2,932	3,167	3,193	3,193	3,193
R ²	0.57742	0.59761	0.75900	0.82751	0.82982	0.80714	0.47704
RHS_zip5 fixed effects	✓	✓	✓	✓	✓	✓	✓
RHS_year_open fixed effects	✓	✓	✓	✓	✓	✓	✓

Notes: Table reports coefficients and 95% confidence interval from regression of number of competitors per square mile on whether or not the store has an exclusive deal, with year and zip5 fixed effects. We only use grocery chains and big box stores. Competitors are defined as grocery, big box, and drug stores. Data is based on the exclusive deal data from the Cook County recorder office and the retailer location, entry, and exit comes from the SNAP data.

C.3 Retailer Density: Entry and Exit

The change in the consumer responses is almost certainly driven by changes in market structure. Ultimately, the goal is to understand how covenant affects entry, exit, and the density of grocery store locations. As an example of how covenants might affect consumers through changes at market structure, I look at the effect of grocery exit on market structure (to compare with the consumer results above). Specifically, I compare grocery exit with and without covenants. Since covenants are all chains, the control group are chain stores that also exit in Cook county, but those that do not enter with a covenant. The goal is then to compare the market structure within a radius after a grocery store exits with a covenant as opposed to when a grocery store enters without a covenant. The specification run is then the two-way fixed effect difference-in-difference-in-difference:

$$y_{r(i)t} = \sum_{k=-T, k \neq 1}^T \delta_k D_{it} + \text{zip}_i + \text{year}_t + \epsilon_{it}$$

$$y_{r(i)t} = \sum_{k=-T, k \neq 1}^T \beta_k \text{cov}_i D_{it} + \text{cov}_i + \text{zip}_i + \text{year}_t + \text{cov}_i \text{year}_t + \text{cov}_i \text{zip}_i + \text{zip}_i \text{year}_t + \epsilon_{it}$$

Figure 23 shows the results of these event studies. The outcome, $y_{r(i)t}$, is the number of grocery stores within radius $r(i) = 1$ mile of the grocery store entry. The coefficient of interest are β_k and δ_k . The results show that the loss of a grocery store is mechanical in both cases: both coefficients fall to -1 in the first year. However, there is recovery in locations without covenants as compared to locations with covenants.

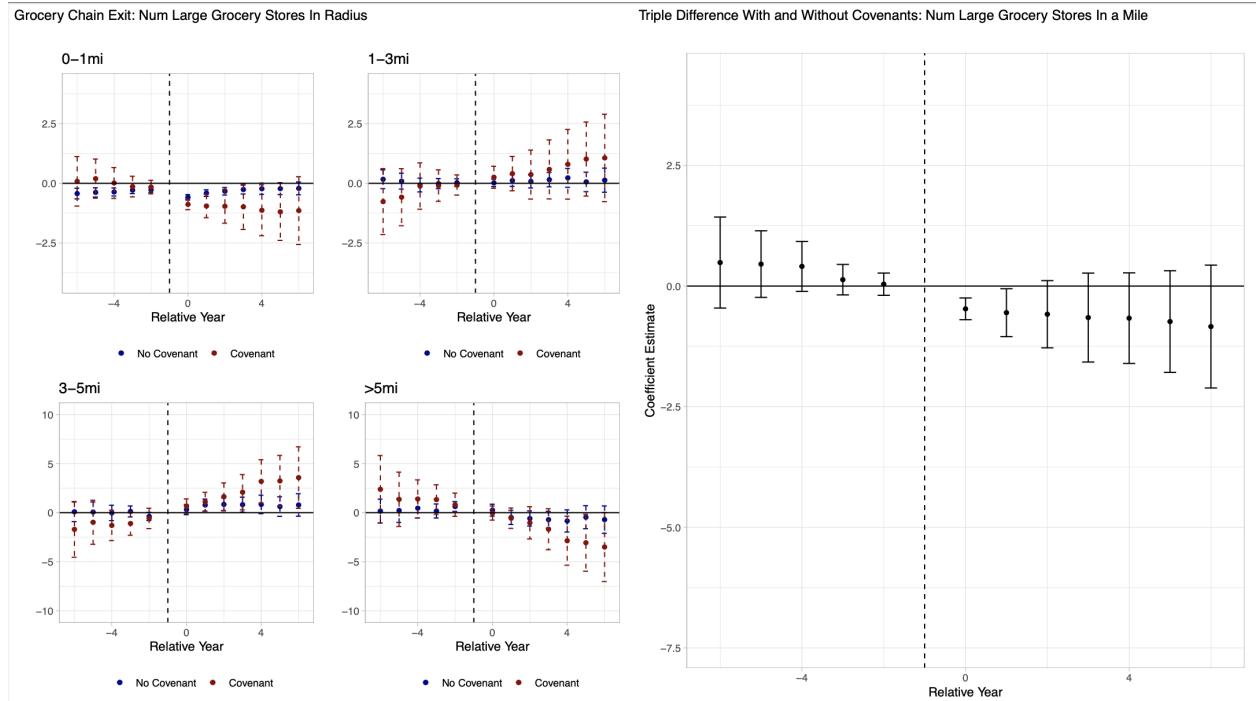


Figure 23: Number of grocers response to grocery store exit.

C.4 Exclusive Deals Predict whether Stores are Substitutes or Complements

Evidence from the dollar store:

$$\log y_{jt} = \alpha + \beta_{j'} 1\{t \in t^*\} 1\{j' \in J\} + \phi_{j'} + \sigma_t + \sum_{k,\tau,r} \beta_{k\tau r} x_{kr_j\tau} + \epsilon_{ijt} \quad (6)$$

where y_{jt} (approx) revenue store j in market t , or consumer expenditures, and j' is the competing/complementary store.

