Rent Control and Evictions: Evidence from San Francisco

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Abstract

Forty years on, cities with tenancy rent control are still facing pervasive housing shortages and sky-high rents. A possible reason is a rent control consequence typically ignored or assumed away: economic evictions. In this paper, the link between tenancy rent control and economic evictions is empirically demonstrated for the first time. Further, the analysis finds that instead of just tactically evicting individual tenants to capitalize in higher base rents, landlords will sometimes evict all tenants and remove the building from the controlled housing market altogether even when rents are rising. If landlords were to experience an approximately 6.4% uniform increase on vacant unit rents, there would be an additional 6,732 single unit evictions and 80 additional whole-building evictions per year in San Francisco’s controlled sector. This paper findings suggest that ignoring the role of evictions in rent control welfare analyses leads to the literature overlooking critical implications for the distributive and housing supply impacts of rent control.

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Introduction

Forty years after New York City, Los Angeles, Washington D.C., Oakland, San Jose, and San Francisco adopted tenancy rent control, its success is in doubt. Intended to aid low- and middle-income renters, these same metros are instead plagued by housing shortages and limited housing affordability. This growing affordability crisis has been met largely by silence from the literature. This dearth of studies is all the more surprising because the controlled rental housing stock is clustered in some of the nation’s wealthiest and most productive cities and is a substantial part of each: 1/3 of rental housing units in San Jose, 85% in Los Angeles, 2/3 in Oakland, 2/3 in Washington DC, roughly 47% in New York City, and 72% in San Francisco.

One rent control assumption well overdue for study is that rent control regimes successfully ban economic evictions. This is an important gap in the literature, because evictions under rent control impact key questions of recent interest, such as demographic distribution of people and workers in cities (Diamond (2016)) and the ability of workers to migrate to productive regions (Bunten (2016); Hsieh and Morietti (2015)). Many analyses finding controls decrease mobility or cause misallocation of units rest on the assumption that evictions due to profit-seeking by landlords, hereafter called “economic” evictions, cannot or do not occur. Yet, the truth is that evictions are merely limited under rent control but not completely forbidden. Controlled landlords can both evict troublesome tenants and, in certain cases, exit the controlled market altogether. All cities have limited (yet legal) provisions that allow landlords to evict all current tenants, demolish the old building, and rebuild without fear of reimposed controls because of long-standing new building exemptions from controls. Thus, findings in the literature understate tenant turnover and overstate the persistence of controlled housing and concurrent market distortions. What this means for prospective tenants, short-term vacancy rates, and the long-run viability of rent control is largely unknown.

In this paper, two research questions relating to rent control and economic evictions are addressed. The first hypothesis is that controlled landlords engage in profit-seeking behavior by selectively evicting tenants in spite of barriers erected to prevent this: strong tenant protections, greater scrutiny aimed to discourage them, limitations on grounds for evictions, and legal buyouts of the tenant’s lease. The second hypothesis is that despite of policy incentives for landlords to stay in the controlled market, some economic evictions occur when landlords respond to price signals by using evictions to switch to the uncontrolled sector. The implications of the empirical findings for the long-run trajectory of tenancy rent control are considered and discussed.

Testing the first hypothesis is an especially important contribution to the literature because the “no economic evictions under rent control” assumption is virtually universal in this literature. Empirically establishing that economic evictions occur opens up new lines of inquiry for researchers prepared to draw novel conclusions from incorporating profit-driven evictions. Secondly, finding that controlled landlords are willing to switch markets when rents rise calls into question the long-run viability of any rent control regime would be a new, and vital, addition to the rent control literature.

2San Francisco’s Rent Stabilization and Arbitration Ordinance, SF Administrative Code §37.1(b)(1), claims its purpose is to resolve “..a shortage of decent, safe and sanitary housing in the City and County of San Francisco resulting in a critically low vacancy factor”

3According to Census Bureau April-June 2016 figures, all of the major cities’ metropolitan areas with rent control had rental vacancy rates at least a point below the national average of 6.7%. These same six cities occupy the top 7 places with the most expensive rents, with Boston (a former rent control city itself) being the seventh. Source: Zumper, Inc. https://www.zumper.com/blog/2016/04/zumper-national-rent-report-april-2016/ last accessed October 15, 2016.

4Public interest in rent control has recently reemerged. Seattle and several Bay Area suburbs have seen tenant advocacy groups emerge in favor of rent control, with Alameda, Burlingame, Mountain View, Richmond, and San Mateo in California have November 2016 ballot measures asking voters whether they want to impose controls.

5Section B has an overview of San Francisco’s Rent Ordinance and Appendix A has a more detailed policy discussion of rent control and eviction laws in other jurisdictions. Appendix A also has the sources for these figures.
Empirically testing for economic evictions means showing that evictions rose in response to a known price shock and landlords can then choose to use an eviction to stay in the controlled market or exit. The price pressure must be well-identified and exogenous to avoid biased estimation from tenant self-selection into rent control on unobservable characteristics (Glaeser (2003); Early (2000); Ault, Saba, and Jackson (1994)). This paper uses San Francisco data because a unique, spatially-varying, plausibly exogenous price shock exists there: the network of commuter corporate shuttles stops operated by Google, Apple, Facebook, and Electronic Arts (EA), which transport technology workers from various sites around San Francisco to Silicon Valley and is a highly valued employee benefit (Dai and Weinzimmer (2014)). The paper uses shuttle stop placements as a time- and area-varying free-market rent increase identification strategy, and investigates whether buildings in the vicinity of a new stop have an increased incidence of evictions. The value of the shuttle’s transit amenity is shown to be capitalized into housing prices, and substantial enough to plausibly incentivize the marginal landlord to evict.

San Francisco landlords can choose between two eviction types. The first is an “at-fault” eviction, whereby a landlord clears out a tenant in breach of the lease, and the newly-vacant unit returns to the controlled market. The second is a “no-fault” eviction, which as their name implies, occur even when the tenants are fully lease-compliant. Landlord can use them to make the entire building vacant, which makes the properties easier to sell or demolish. However, no-fault evictions are very expensive, because landlords must pay their tenants’ relocation costs and allow a 3-10 year waiting period to elapse before controls are removed. Both eviction types are analyzed separately, to test whether landlords in the face of a price shock will choose to stay (an “at-fault” eviction) in the controlled market or go (a “no-fault” eviction) into the uncontrolled market.

This paper finds evidence that landlords engage in economic evictions. First, I find that the commuter shuttles raised the price per owner-occupied housing unit by $32,954 and yield a price increase of 6.4%. The first result is significant because landlords stand to recoup at least their fixed eviction costs in the long-run after a shuttle stop goes in when they switch to the uncontrolled market. The second result indicates that the price percent change exceeded the maximum allowable annual rent increase for controlled units. Generalizing the percent increase across housing markets, the shuttles plausibly create a true economic incentive for landlords to pursue an eviction to capitalize in higher rents they cannot realize through other means. If all controlled landlords were to experience a uniform expected rent increase of approximately 6.4%, there would be an additional 6,732 at-fault evictions a year. These create greater tenant turnover in the controlled market than would otherwise exist, but leaves the stock of controlled housing unchanged. However, that same uniform increase is estimated to cause 160 additional units to withdraw from the controlled market a year, likely permanently. Extending findings from other papers, the pattern of evictions indicates that the current policy structure is inimical to using rent control to create a more income-equitable allocation of housing in San Francisco, while also exacerbating housing market distortions.

Section 1 gives an overview of San Francisco’s rent control and evictions laws and gives evidence for the study’s external validity. Section 2 is a literature review that motivates the research questions by highlighting extant work on rent control, its relevance to economic evictions, and generate predictions of how landlords will use evictions in response to a price shock. Section 3 details the data used to test the hypothesis. Section 4 explains the empirical strategy. Section 5 gives results from the empirical strategy, and Section 6 is a discussion of the policy and economic considerations of the results. Section 7 concludes.

Cities do attempt to discourage economic evictions through a variety of processes, but those that can be used to convert the property to the uncontrolled market often come with provisions that effectively remove the unit from the rental market for multiple years. Discussed in more detail in Appendix A.
1 San Francisco’s Rent Ordinance and Its External Validity

This section gives a brief overview of San Francisco’s rent control and evictions policies and some policies in other cities. Policy details will be referenced throughout the rest of the paper to help tie the results to the literature. The external validity of the study is also discussed, but most policy details from other cities are left for Appendix A.

1.1 The Ordinance

I begin with the four key provisions of San Francisco’s Rent Ordinance:

1. **Rent increases are capped at 60% the rate of inflation.** Many maintenance costs can still be passed through to the tenant. Limited hardship provisions exist to ensure that landlords can earn a profit.

2. **Security of Tenancy.** Landlords cannot refuse to renew the lease of a tenant in compliance. After the original lease expires, tenancy becomes month-to-month. Lastly, eviction notices must be for “just-cause” and approved by the San Francisco Rent Board.

3. **Vacancy decontrol-recontrol (or vacancy decontrol).** Tenants and landlords are free to negotiate the base rent, and only subsequent increases are controlled (capped). After a tenant vacates, the landlord can freely negotiate a new base rent with the next tenant and once again controls only apply to subsequent rent increases.

4. **No new controlled buildings.** Only buildings built before June 13, 1979 and with 2 or more units are subject to rent control.

As stated in Provision 2, rent controlled landlords must have a “just cause” for an eviction. The 15 grounds for a “just-cause” eviction are given in Table 1. There are 7 grounds for which a tenant is “at-fault”, or is in some way in breach of the lease and 8 grounds where the tenant is not at fault, or “no-fault”. Six of these no fault evictions are not part of this study because they are either for temporary improvements made to the building, very rarely permitted by the city, or are suspended from use. Landlords most commonly use two no-fault eviction types: owner move-in (OMI) evictions, where the landlord wants to reclaim the unit for personal use or use by a close relative, and Ellis Act evictions, where the landlord can withdraw the units from the rental market altogether.

OMI and Ellis Act evictions are advantageous to landlords because tenants can be evicted even when fully compliant with the lease and, unlike demolitions or rehabilitations, there are minimal bureaucratic delays. Critically, they also create opportunities to exit the controlled market. It is easier to obtain a demolition permit for vacant units and buildings. The new building exemption (Provision 4) means that new residences on the property will be uncontrolled.

What the city lacks in red tape for OMI and Ellis Act evictions, it compensates for by making them very costly. Tenants are entitled to relocation payments of at least $5,200 and up to almost $20,000 (December 2013) for a unit with 3 or more tenants if one of the tenants is elderly, disabled, or a legal minor. (December 2013) Vacancy decontrol is suspended on the units for up to 3 years.

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7 More information is in Table 1 but the seven grounds are 1.) on-payment or late payment on rent, 2.) general breach of the lease, 3.) nuisance, 4.) illegal usage of unit, 5.) refusing to quit after previously agreeing to end tenancy, 6.) refusing to grant landlord lawful access, and 7.) sole remaining tenant is an unapproved subtenant.

8 These include temporary eviction for lead abatement or capital improvements; revoking of “Good Samaritan” status for tenants who are fleeing natural disasters; and converting rental units to condominiums, which was suspended in 2013 after being allotted very rarely by lottery in the previous decade. Demolitions are more commonly granted, but only after an extensive permitting process and are thus strongly endogenous to local conditions.
after an OMI eviction and 10 years after an Ellis Act eviction if the landlords rent the units. Landlords can only do one OMI eviction per building and the set-aside unit is marked on the deed. A post-Ellis Act vacant building faces additional restrictions. A ten year period is marked on the deed where the new building exemption is suspended for property. If the landlords demolish the old units and builds new ones during this time, rent control will apply to the new units until the waiting period expires.

San Francisco is clear that controlled unit evictions should only happen “in good faith” (San Francisco Administrative Code §37.9(8)) but fluctuations in eviction counts follow changing economic conditions. Table 2 shows the yearly number of controlled unit evictions for all at-fault evictions, OMI’s, Ellis Act evictions, demolitions, and the annual change in the Bureau of Labor Statistics Consumer Price Index (CPI) for the rent of the primary residence for the San Francisco Bay Area. At-fault evictions in particular track changes in the rents. The relationship between economic growth and evictions is visually displayed in Figure 1 which shows the annualized percent change in eviction counts against expansion and recession years. The graph underscores that evictions may well have an economic component: evictions tended to grow year on year during expansions and decline during the recession.

Non-controlled landlords can evict tenants without cause, pursuant only to the lease and relevant state and city laws. However, court filings reveal that many landlords choose to give a cause anyway because it aids the landlord’s chances in court. Most evictions in the uncontrolled market are similar to the controlled market: failure to pay rent, breach of lease, nuisance, etc., but there are broadly two “no-fault” evictions: reclamation of the property or eviction after a foreclosure. The former is more common and reflects that many tenancies in San Francisco are month-to-month after an initial one year lease has expired. Uncontrolled landlords typically do not need to pay relocation expenses, except in the case of a legal settlement.

Tenants and landlords can avoid an eviction altogether through a buyout agreement. Downs (1988) explains that court cases for at-fault evictions are costly, time-consuming, and uncertain, so landlords prefer to buy out a tenant first. Legal buyouts do not mean that the economic eviction rate is zero. Evictions are a landlord’s credible threat to achieve a higher rate of successful buyouts, but then can be used for recalcitrant tenants. Legal buyouts’ significance for this study is only to artificially lower the observed economic eviction rate.

In summary, rent control works by locking landlords and tenants into a base rent that slowly erodes in real terms with each passing year. Tenants can only be evicted for violating the lease or under limited, expensive circumstances when lease-compliant. The only path to full decontrol is to demolish the current building and rebuild it, pending approval for a city-granted demolition permit.

1.2 External Validity

San Francisco’s rent control provisions are not unique. The other five major U.S. cities with rent control, Los Angeles, Oakland, San Jose, New York, and Washington have very similar rules. All five have at least limited vacancy decontrol coupled with yearly rent increase restrictions. All have new building exemptions, and all allow tenants to indefinitely renew their leases. Only San Jose does not require a just cause for an eviction, but even there, landlords have to go through a city-mandated arbitration process to evict.

9 More specifically, landlords can only use the no-fault evictions to “...recover possession in good faith, without ulterior reasons and with honest intent”, San Francisco Administrative Code § 37.9(8)
10 The Great Recession is marked in the graph as being 2008 and 2009 for comparative ease with annual changes, but it technically extended from December 2007 through June 2009.
11 More information is given in Appendix A, an extended review of rent control and eviction policy throughout the United States, including more detail on San Francisco’s laws, California state laws, and municipal laws in Los Angeles, Oakland, San Jose, Washington D.C., and New York City.
San Francisco’s city government has limited power to change the economic eviction incentive structure. Provisions (1) and (2) are legislated by the city, but the last two are a matter of state law. Ellis Act evictions are also governed by state law. The ability to do no-fault evictions are thus exogenous to local conditions and are the same across all California cities with rent control.

Thus, if economic evictions are found in San Francisco, they are found elsewhere. The most significant difference is that the economic eviction rate is probably elevated in San Francisco. San Francisco is distinguished as the only major city where rent increases do not keep pace with inflation. Economic evictions are therefore more strongly incentivized in San Francisco than elsewhere because landlords face steeper losses with the passage of time.

2 Literature and Theoretical Review

Three questions motivate this paper: why are controlled landlords incentivized to do an economic eviction? Do landlords perform more evictions when prices rise? Do rising prices incentivize no-fault evictions (leaving the controlled market) or at-fault evictions (staying in the controlled market)? The last question is critical for understanding the long-term viability of rent control. Per Section 1.1, no-fault evictions allow landlords to switch their properties to the uncontrolled sector. If no-fault evictions increase with rents, rising prices will accelerate the demise of the controlled housing stock. This literature review explores answers to these questions from other papers and highlights this paper’s contributions.

2.1 Existing Literature on Rent Control and Evictions

The only extant analysis of rent control and evictions is by Miron (1990). His model assumes that rents are capped and economic evictions are impossible, so landlords’ constrained eviction ability incurs higher costs due to adversely selected tenants. Miron considers an adversely selected tenant to be a legally-protected tenant who abuses the tenancy security laws by being a nuisance or frequently delinquent on rent. However, under rent control, adverse selection is not just about tenant quality, it is also about tenants’ expected duration.

Consider San Francisco’s annual rent increase cap, which is equal to 60% the rate of inflation (Provision (1)). Landlords’ losses increase every period market rents rise faster than the allowed increase. If a tenant can be induced to leave, the landlord can lock in a higher base rent with a new tenant thanks to vacancy decontrol (Provision (3)). Controlled landlords in a rising market thus want “short-stayers” so they can frequently reset base rents, and avoid “long-stayers” who compound losses with each subsequent rental period. Coupled with the other kinds of adverse selection mentioned above, rent control landlords run a substantial risk of acquiring an expensive, undesirable tenant they cannot be rid of.

Rent control distorts the housing market because controlled landlords prefer short-stayers but cannot directly observe the tenant’s duration preference. Long-staying tenants, knowing this, are incentivized to present themselves as short-staying tenants. Landlords must then maximize their

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12 All relevant provisions can be found in San Francisco Administrative Code §37.2, §37.3, §37.9A et seq., and §37.10
14 The Ellis Act 1985, California Codes § 7060-7060.7
15 Not including those remaining units in New York City under first-generation rent control.
16 Miron (1990) and Hubert (1995) use “economic eviction” to mean pricing a troublesome tenant out of their unit. This is not possible under tenancy rent control by design, so I believe it is more useful to discuss it in this context as an eviction driven exclusively by profit-seeking behavior on the part of the landlord.
17 Even in a static market, landlords will suffer losses due to erosion in real rents.
profits in the face of uncertainty engendered by imperfect information on the tenant’s true type (Basu and Emerson (2000, 2003); Arnott and Igarashi (2000); Hubert (1995); Iwata (2002)), raising costs for everyone.

Miron concludes that landlords will turn to one of two recourses when they cannot evict: charging significantly higher first-year rents to compensate for adverse selection’s expected costs or withdrawing from the rental market altogether. However, Miron’s paper, like all others in the literature, considers only the extreme case that evictions are entirely prohibited. Section I.1 and Appendix A are clear that evictions are not forbidden only limited to just causes in most rent control cities. Nonetheless, knowing the outcome at the “corner solution” of \( P(Eviction) = 0 \) is useful for considering cases where \( P(Eviction) > 0 \).

2.2 Predicting How Evictions Respond to Price Shocks

The above section establishes why prohibited evictions are costly for landlords, but does not directly answer how rent control incentivizes evictions. The two sections below draw on the literature to hypothesize how landlords will utilize evictions when market rents change.

2.2.1 “3 Days to Make Whole Or Quit”: At-Fault Evictions and Price Shocks

A reasonable hypothesis from Section 2.1 is that controlled units have a higher baseline at-fault eviction rate than uncontrolled units. “Bad” tenants are disproportionately drawn to controlled units because of tenant security laws (Provisions 1 and 2), and rent control puts financial pressure on landlords to turnover tenants (Provisions 1 and 3). Any study on evictions needs to account for differential eviction rates caused by selection into rent control on unobservable tenant characteristics.

There are some barriers to tactical at-fault evictions in the controlled sector. Landlords must file in writing with the Rent Board the notice to quit, justify the grounds given, and give an opportunity to make whole the breach in the lease. They must also inform the tenant of their rights under the Rent Ordinance in writing. If the eviction is ruled to lack a just cause, the landlord has to pay at least three times the actual damages, including mental and emotional distress. These regulations exacerbate the moral hazard and an adverse selection problems, both because self-aware “bad” tenants can outbid “good” tenants for these protections, and because those in controlled apartments have fewer incentives to remain good-quality tenants.

Ex ante, these barriers are probably not prohibitive enough to completely deter economic evictions and likely exacerbate the underlying adverse selection problem. Thus, a reasonable prediction is that price shocks raise an already elevated eviction rate in controlled units.

2.2.2 “Everybody Out!”: No-Fault Evictions and Price Shocks

Drawing reasonable hypotheses on no-fault evictions is harder, but even more important because they impact the long-run housing supply. High upfront costs mean that the baseline no-fault eviction rate is almost surely lower in controlled units. A price shock to uncontrolled units likely lowers their no-fault eviction rate, because simple supply and demand suggests that landlords are unlikely to withdraw or repurpose units when rents rise.

On the other hand, o-fault evictions for controlled units might rise with rents because these evictions clearly have a “pull” component. If landlords believe that rents will persistently increase or a price shock is permanent, they’ll anticipate that greater long-term profits in the uncontrolled sector will cancel out the short-to-medium term losses from the eviction. Further, the literature

\[ \text{The exception is if the unit is being used for illegal purposes. The notice to quit in that case is unconditional.} \]

\[ \text{San Francisco Rent Ordinance Administrative Code § 37.9(f)} \]
suggests that controlled landlords have a “push” component to use no-fault evictions, particularly when prices are rising.

That last prediction is drawn from two papers on tenancy rent control by Basu and Emerson (2000, 2003). They point out that landlords’ adverse selection problem worsens when rents increase because only tenants preferring long durations are willing to pay the controlled unit premium. Worse, rising rents also endogenously increase chosen long durations (Basu and Emerson (2000)). Several papers have empirically and theoretically demonstrated that tenants do pay a premium for rent control and security of tenancy, including Raess and von Ungern-Sternberg (2002), Skelley (1998), Arnott (1995), Turner and Malpezzi (2003), and Arnott and Igarashi (2000).\textsuperscript{20} Nagy (1997) found using New York City data that landlords collected the same average rent per tenancy across controlled and uncontrolled units, which could only be true if tenants were willing to pay a higher base rent at the outset.

How serious of a problem are long-stayers for controlled landlords? If landlords conclude they are very likely to be saddled with a costly long-stayer, Miron (1990) and Basu and Emerson (2003) explain they will choose market exit over finding a new tenant. The crux of the problem is that unlike rent delinquents and nuisances, controlled landlords lack any direct remedy for long-stayers. Tenants have indeed been repeatedly found to disproportionately have long tenures in all forms of rent control (e.g. Linneman (1987); Gyourko and Linneman (1989); Munch and Svarer (2002); Nagy (1995, 1997); Basu and Emerson (2000)). Long durations are incentivized not just by increasingly steep rent discounts when the market as a whole is rising, but also by security of tenure itself (Basu (1989), Iwata (2002)). Unfortunately for landlords, not only are long-stayers disproportionately attracted to rent control, but Ault, Jackson, and Saba (1994) found that up to 80% of the extra tenancy duration is due to tenants endogenously choosing to extend their tenancies. Tenants have been documented going to some lengths to retain their controlled units, such as by increasing their propensity to accept a local job (Svarer, Rosholm, and Munch (2005)) or accepting longer commutes (Krol and Svorny (2005)) when switching jobs. Rent control’s de facto subsidy to tenants to remain in place thus creates labor market mismatches and congestion externalities in addition to artificially lowering vacancy rates and landlord profits. All these problems will exacerbated as rents rise, and in fact, might also spur further declines in the controlled housing stock.

2.2.3 Eviction Costs

The final consideration is how much will rents need to rise to plausibly incentivize the marginal landlord to evict. The literature is generally silent on the overall cost of an eviction, focusing either on the financial profile of evictees (Boheim and Taylor (2000)), their demographics (Desmond (2012)), or on landlord behavior when the tenant is in arrears (Gurell (2014), Mullen et al. (1999), Stenberg et al (2011), among others).

I propose two benchmarks for whether prices rise enough to incentivize evictions:

1. Rent changes should exceed the annual allowable increase

2. Per unit price changes should exceed the fixed cost of a no-fault eviction from relocation payments.

The first ensures that controlled landlords cannot realize any gains in market rents and are incentivized to push out tenants. Between 2003 and 2013, the highest allowable annual increase was 2.7%\textsuperscript{21} The second condition ensures that landlords could plausibly profit from a no-fault

\textsuperscript{20}The findings in these models rest on the assumption of absolute security of tenancy, but there is no reason to believe that even partial security of tenancy would not be valued by tenants.

\textsuperscript{21}“Allowable Annual Rent Increases”, The Residential Rent Stabilization and Arbitration Board of the City and County of San Francisco, 2016.
eviction. Given the great variation in eviction costs detailed in Appendix A.1.2, exceeding at least the fixed cost of relocation payments is the most plausible minimum condition to push a landlord into a no-fault eviction. In the empirical exercise, I show that at a minimum, the hedonic value of a shuttle stop exceeds the most expensive relocation payment per unit of $19,000 and increases the value of a unit by more than 2.7%.

3 Data

Data for evictions come courtesy of the Rent Board of the City of San Francisco, which reports information on just-cause evictions since January 1st, 1997. The data set includes the address of the eviction, the date the eviction was served, and the reason for the eviction. They provided me a dataset that totaled 30,992 evictions. Errors in the recorded addresses were corrected by consulting Google Maps and a dataset of addresses from the City of San Francisco’s Planning Department. All merges involving addresses therefore occur at the building or parcel level and not for the specific housing unit. For less than 0.5% of the evictions, the address could not be determined from the record, and these observations are excluded. Furthermore, an additional 9% of addresses did not match with any known address in the city’s database. After consulting with the San Francisco Rent Board, they believe these are mostly illegal units, and therefore unmatchable to the official address list. Supplementing this data set with eviction notices not directly filed with the San Francisco Rent Board are court filings from the Superior Court of San Francisco County. Plaintiffs filing an unlawful detainer action will include in their court documents scanned copies of their eviction notices and other relevant information.

Coverage of San Francisco by the commuter shuttle fleets operated by Google, Apple, Facebook, and Electronic Arts was found for September 2004 (the date the first shuttle appeared) through December 2013. Information on other transit options, such as the placement of Bay Area Rapid Transit (hereafter BART), Caltrain, and San Francisco Metropolitan Transportation Agency (SFMTA) MUNI Metro light rail stops came from their respective transit agencies. A dataset on the placement of SFMTA public bus stops in San Francisco was constructed from a four cross-sections provided by the agency. More information on how the commuter shuttle stop was constructed can be found in Appendix B.

Data for housing values and building characteristics come from the City and County of San Francisco’s Office of the Assessor-Recorder. Supplemental information on addresses, latitude and longitude, and other parcel characteristics was obtained from the website of the City and County of San Francisco. The dataset covers assessments made yearly from June 2003 to June 2014, for 2,373,721 observations, ranging from 188,333 parcels in 2003 to 205,229 parcels in 2014. Some records were self-evidently corrupted, and were cleaned through manual inspection and by comparing other records for the same parcel. For the hedonic price analysis, only transactions coded as a sale are retained. For the evictions regressions, all public housing complexes are dropped.

Specific information on when buildings were built, destroyed, and certified for occupancy at the year/month level was obtained from the City of San Francisco’s Department of Building Inspections. Data on the certificates of final occupancy were purchased from the same department.

Table 3 presents information about the housing market in San Francisco. San Francisco’s housing stock is disproportionately older, and apartment buildings comprise just over half of the stock. The

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22 In Appendix A.1.2, I estimate that premium a landlord pays to do an owner move-in eviction from a controlled unit and arrive at a midpoint estimate of $37,596.71, inclusive of the estimated foregone rents.

23 maps.google.com

24 data.sfgov.org

majority of housing units are also rent-controlled, and the decade between 2003 and 2013 saw a decrease in the number of rent-controlled housing units, apartment units, and residences. As the housing stock modernized, rental units are being replaced with owner-occupied single-family housing. The other notable feature is that on average, the nearest shuttle stop is less than a half-mile away, meaning that condos did in fact experience significant “treatment” from the placement of shuttle stops.

Any parcel or eviction that is in Golden Gate Park, the Presidio, or Yerba Buena and Treasure Islands is dropped. The former two are dropped because they are park properties and the latter because they are small, non-contiguous parts of the city. This leaves 85 neighborhoods in the evictions analysis covering 126 months for 10,710 observations. To test for economic evictions at a more disaggregated level, another panel was constructed from the same source of rental buildings with two units or more comprising 37,000 buildings across 126 months.

4 Empirical Approach

This paper asks whether rent-controlled landlords engage in economic evictions, either to replace the existing tenant with a new tenant who pays a higher base rent or as a means of exiting the controlled market entirely. The ideal empirical strategy would be to estimate an equation of the form:

\[ Eviction_{it} = \zeta_0 + \zeta_1 Rent^{RC}_{it} + \zeta_2 RentControl_{it} + \zeta_3 (Rent^{RC}_{it} \times RentControl_{it}) + \zeta_4 Time_t + \zeta_5 F_i + \zeta_6 OtherControls_{it} + \epsilon_{it}, \]  

where \( Rent^{RC}_{it} \) is the prevailing rent for a vacant controlled unit in building or area \( i \) during time period \( t \); \( Time_t \) is a fixed effect for time period \( t \); \( F_i \) is a fixed effect for the building or area; and \( OtherControls_{it} \) are other characteristics relating to rent control and evictions.

However, including \( Rent^{RC}_{it} \) creates prohibitive challenges. Even if an exhaustive dataset of rents existed for both the controlled and uncontrolled sectors, rents are endogenous to evictions by the very premise of this paper. This makes consistent estimation of Equation (1) impossible. Since rents are both systematically unobservable and endogenous, I instead proxy for changes in the market rent level using changes in local transit amenities created by the local roll-out of Google, Apple, Facebook, and Electronic Arts’ commuter shuttle stop program.

Figure 2 shows how the shuttle stops spread throughout San Francisco, starting from September 2004, when Google placed the first two stops, to the study period’s end in December 2013. The shuttles are an important employee benefit, because the distance from San Francisco to worksites in Silicon Valley can be as long as 50 miles. The shuttles have wireless internet, and many employees can now use their practically door-to-door, free commutes to get work done (Dai and Weinzimmer (2014)). Proximity to a shuttle stop is thus a transit amenity a technology company employee might value highly. Although the shuttles are a private good, demand for access should be strong enough to impact neighborhood housing markets.

The shuttles were first initiated by Google in 2004 and went to just two locations: Glen Park BART Station and a park and ride stop near Candlestick Park (Spivack (2004); Thomas (2012)). Yahoo initiated its own service in 2005, followed by Genentech in 2006, Apple in 2007, Facebook in 2009, and others after the recession (Dai and Weinzimmer (2014)). By 2009, the shuttles had come to cover many city neighborhoods either completely or in part, particularly in the eastern half of the city. The shuttle stops clearly favored the city’s east and northeast, and so like \( Rent^{RC}_{it} \),

26Genentech and Yahoo! shuttle stops are not included in this study, but existing information indicates that they overlapped with Google, Facebook, and Apple stops almost completely.
the shuttle stops are likely endogenous to local conditions. Therefore, I instrument for shuttle stop locations by exploiting exogenous constraints on their placements. The commuter shuttle stops can only be located at these large public stops, called bus zones, because the shuttles are otherwise too large for San Francisco’s streets. Patterns for shuttle stop placement are detailed below in Section 4.1.2.

The empirical investigation is thus conducted in two stages. The first stage establishes that the transit amenity from the commuter shuttles is capitalized into local housing prices. I instrument for shuttle stop placement and reestimate the shuttle’s hedonic price effect. The value of the amenity is found to be plausibly large enough to incentivize a landlord to evict because it exceeds the values given as Conditions 1 and 2 in Section 2.2.3 as being necessary to plausibly incentivize the marginal landlord to evict. The second stage tests for economic evictions by how eviction rates, counts, and probabilities change in response to greater commuter shuttle coverage and thus higher prices. I present estimates on changes in evictions after exposure both to the observed and fitted shuttle placements.

4.1 Hedonic Price Effect of the Commuter Shuttles

In the absence of rent data, condominium sales in San Francisco from July 2003 to December 2013 are used to estimate the effect of the shuttle stops on housing values. A series of hedonic price regressions show that the transit amenity from the privately-provided commuter shuttles is capitalized into local housing values and that this transit amenity is substantial. The key identification assumption here is that there are no other unobserved shocks to the outcomes coincident with shuttle placement that affected pricing outcomes.

This exercise establishes that the new transit amenity very likely put upward pressure on prices exogenous to changes in the condominium market. The inference about concomitant rent pressure is made even though changes in condominium prices cannot be directly used to determine the equivalent rent hike. Condominium and apartment unit supply are endogenous (Sinai (2008)).27 even when there is rent control (Häckner and Nyberg (2000)). Condominium sales prices also provide a useful way of appraising the net present value of the transit amenity. It is germane to the paper’s hypothesis because landlords will consider that information when deciding whether to use a no-fault eviction to exit the rent control market. Thus, while this analysis cannot determine exactly how the shuttles change the controlled rent premium, quantifying it from condominium sales is sufficient to establish that it exists in apartment rents.

4.1.1 Estimating the Commuter Shuttles’ Transit Amenity Value from Condominium Sale Prices

The hedonic price equation to estimate the shuttle amenity in condominium sales takes the following form:

\[ Price_{it} = \alpha + \beta_1 \mathbb{1}\{Shuttle_{it}\} + \beta_2 New_{it} + \beta_3 Baths_{it} + \beta_4 SqFt_{it} + \beta_5 YearBuilt_{it} + \beta_6 Beds_{it} + \beta_7 OtherTransit_{it} + \beta_8 Nbrhood_{it} + \beta_9 Y_t + \beta_{10} M_t + \epsilon_{it}, \]

where \( \mathbb{1}\{\text{Shuttle}_{it}\} \) is an indicator for whether condominium \( i \) is a half-mile from the nearest Google, Apple, Facebook, or Electronic Arts shuttle stop. This is the treatment variable of interest. Control variables include \( \text{OtherTransit}_{it} \), a collection of measures of how far the condo is from other forms

\[^{27}\text{In my sample, the correlation in the sales price between condominiums and apartment buildings was 0.645.}\]
of transit, the number of baths in the condo; \( SqFeet_{it} \), the total area of the condo in square feet; \( Beds_{it} \), the number of bedrooms in the condo; \( YearBuilt_{it} \) is the year the condominium was built; and \( New_{it} \) is whether the sale occurred within the first two years after being built. The regressions also control for fixed effects: \( Nbrhood_{i} \), a vector of neighborhood dummies and \( Y_{t} \), a vector of year dummies, and \( M_{t} \), a vector of sales month dummies. The sample is restricted to single-family condos (> 99%) built between 1849 and 2013 that have at least 291 sq. ft.\(^{29}\)

In addition to the linear models described above, a second pair of regressions is run with the log of the price as the outcome variable. The linear-linear model is informative about whether the shuttles raised per-unit prices by enough to exceed relocation costs (Condition\(^ {2}\)) and the log-linear model tells whether the shuttles yield a percent increase in price above the 2.7% allowable rent increase benchmark (Condition\(^ {II} \)).

One issue with the city’s transactions data is that officials made transcription mistakes.\(^{30}\) These mistakes occasionally introduced outliers into the sample. Several strategies were employed to remedy these mistakes, notably cross-checking property information against the online real estate company Zillow’s database. Remaining outliers in the lower tail were winsorized at the 1st percentile (following the suggestion of Bollinger and Chandra (2005)). For outliers in the upper tail, these appeared to be exclusively cases where the city misclassified whole buildings as single unit, single-family condominiums. These were trimmed from the sample by establishing from the Zillow database that no condominium has ever been sold for more than $12,000,000 and had a square footage exceeding 6,000 square feet. 171 properties were excluded on the basis of excessive square footage and 305 transactions were excluded on the basis of a sales price of greater than $12,000,000. This left 31,150 in-sample transactions.

Table 4 shows selected descriptive statistics of the condominiums. Coefficients and robust standard errors from an estimation of Equation (2) are reported in Table 5. Figure 3 shows the distribution of condominiums by neighborhood. Concerns about possible endogeneity between condominium supply and shuttle placement are addressed in the next section.

### 4.1.2 Instrumenting for Shuttle Placement

Consistent estimation of Equation (2) requires that the errors are uncorrelated with the outcome variables. Figures 3(a) through 3(e) strongly suggest that shuttles were not randomly placed. If shuttle location choices were determined due to contemporaneous or anticipated changes in the controlled housing stock, this condition would be violated. For example, areas with more at-fault evictions could be correlated with greater delinquency and ambient nuisance, and are avoided by upper middle-income technology workers.

My identification strategy in light of this potential endogeneity is based on exploiting an exogenous constraint on shuttle stop placements. The constraint is that the shuttles can only stop at public bus stops long enough on each side of the street to accommodate the 50-foot plus mo-

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\(^{28}\) This includes information on how far the average condominium is from alternative forms of transit, including to the BART and Caltrain, to the light rail transit stops, and to major north-south thoroughfares. Specifically, these are the distances in miles to the condominium’s nearest BART station, Caltrain station, MUNI Metro station (but not cable cars), and nearest major thoroughfare segment. The major north-south thoroughfares are 19th Ave/State Highway 1 and extensions, US Highway 101 and extensions, I-80, and I-280. I also control for the distance to the central business district, under the assumption from the monocentric city model that prices are highest closest to it, and distance to the geographical center of the city, allowing for the possibility that prices might rise more away from the center (and closer to the coast). Lastly, it includes the count of the number of public transit stops within a half-mile of the condominium.


\(^{30}\) These include listing the entire building sales price as the individual condominium’s sales price, missing condominium characteristics, bunching of build dates around certain years, such as 1900, and other issues.
torcoaches, called “bus zones.” Figure 3 shows the location of the 870 bus zones that match this description which are about 25% of the SFMTA’s total public bus stops. The greatest concentration of eligible bus zones is in the far northeast part of the city, near the central business district, and extending directly west to Golden Gate Park and directly southwest into the Inner Mission. Outside of these areas, eligible bus zones are much sparser.

Satisfying the exclusion criterion rests on the assumption that while local residents’ location decisions may be influenced by being near a public bus stop, residents are almost surely indifferent to the closest bus stop’s length. The 50 foot constraint is relevant for shuttle placement but not for local prices or anything else correlated with evictions.

The bus zones distribution alone is not enough to predict shuttle placement in the city for two reasons. The first reason is that even with the 50 foot restriction, there are many more eligible bus zones than shuttle stops. The second reason is that the bus zone distribution changes very little over time. The first problem is overcome by exploiting patterns for why certain bus zones were favored above others. Since the shuttles need to be able to reach Silicon Valley, proximity to the one of the north-south thoroughfares was prioritized. Bus zones accessible to the greatest number of people were highly preferred. Shuttles thus tended to stop in bus zones close to centralized commuter transit points not offering transit service to Silicon Valley: MUNI Metro line light rail stops.

Figures 6 and 7 overlay the commuter shuttle stop maps (streamlined from Figures 3(a) through 3(e)), with the underlying transit options in San Francisco at each point in time. The first shuttle stops were along the BART system at Glen Park and a park and ride lot near Candlestick Park (Figure 3(a), but the orientation of the system changed quickly once it became popular (see Appendix B Spivack (2004) and Thomas (2012)). By 2005, shuttle stops prioritizing the MUNI Metro lines originated around Civic Plaza where all the lines converge and spread south and west along the “spokes” of the light rail system. Stops oriented toward just the thoroughfares clustered first in the far north where there are few other transit options, before spreading south and west.

Time variation is the second obstacle to identification. Three strategies are used to account for time variation in network growth. The first strategy is to interact each spatial location instrument with year dummies to capture yearly shocks to network placement. The third strategy is to interact each spatial location instrument with a monthly linear time trend to reflect how the network grew steadily over time. The last strategy is to use measures for cardinal directions as exogenous gradients for the shuttle stop network to grow along.

There are three bus zone spatial dimensions used to identify changes in the shuttle network. The first instrument for shuttle coverage captures changes along a south/west gradient across eligible bus zones near both a thoroughfare and near a MUNI metro station. This is done by interacting the fraction of nearby bus zones that are adjacent to a thoroughfare and a MUNI metro station first by a north coordinate and separately interacted with an east coordinate. The second captures changes along a south-by-southwest gradient for being close to a thoroughfare using the same method. The third instrument is the average length of nearby bus zones and is included under the hypothesis that as the shuttle service grew, particularly large stops would be increasingly favored.

The instrument to predict the first stage takes the form of:

\[
Shuttle_{it} = \alpha + \pi_1 BZ_{ThruHfMiMetro_{it}} \times \text{Dir}_i \times Y_t + \pi_2 BZ_{HfMiThru_{it}} \times \text{Dir}_i \times Y_t \\
+ \pi_3 \text{Dir}_i \times Y_t + \pi_4 \text{Length}_{it} \times Y_t + \pi_5 BZ_{ThruHfMiMetro_{it}} \times \text{Dir}_i \times t \\
+ \pi_6 BZ_{HfMiThru_{it}} \times \text{Dir}_i \times t + \pi_7 \text{Dir}_i \times t + \pi_8 \text{Length}_{it} \times t + u_{it},
\]

\[ (3) \]

Information on the length of motorcoaches used by the companies was unavailable, but MCI motorcoaches that seat roughly the same number of people that Google’s shuttles allegedly do are just over 45 feet long. Anecdotally, Google shuttles appear to be a bit longer, so that 50 feet was selected as the cutoff. The shuttles need room to maneuver in and out of the stop, so a more reasonable cut-off might be more like 70 feet. Source: http://www.mcicoach.com/luxury-coaches/passengerJ4500.htm, last accessed August 28, 2016.

As attested by Cari Spivack, a Google employee (Spivack (2004), Thomas (2012), and Harrington (2014)).
where each variable prefixed with “BZ” was calculated as a spatially-weighted average of the characteristics all the eligible bus zone within a half-mile of each building. East and North refer to the easting and northing coordinates for the bus zones, measured as kilometers east and kilometers north of an arbitrary point in the ocean just southwest of San Francisco. These averages were then aggregated to the neighborhood level when necessary. ThruHfMiMetro_t and HfMiThru_t refer to the fraction of buildings within a spatially-weighted mile of a thoroughfare and a half mile of a MUNI Metro station, or just a half-mile from a thoroughfare, respectively. Each term is thus the interaction between the average bus zone’s easting or northing coordinate, the spatially weighted fraction of nearby bus zones characteristics, and year dummies to reflect the directional gradient. Length_t is the average length of nearby bus zones, and is interacted with year dummies. It is not expressed in Equation (3), but all variables are also interacted with a monthly linear time trend to reflect that the shuttle network steadily expanded over time.

4.1.3 Hedonic Results

The linear specification lower condominium prices by about $14,750, but the log price specification indicate that shuttles raised prices by about 2.5%. Price changes from the shuttles fail both eviction cost conditions (see Section 2.2.3), but as stated in Section 4.1.1, these regressions could suffer from bias from outliers. I thus also include in Table 5 two quantile regressions at the median as a check against outliers. The quantile regressions show that when outliers are factored out, the shuttle raised prices by about $22,300 and yielded a price increase of about 3.6%, satisfying both eviction cost conditions.

Table 6 reports the first-stage estimates and diagnostics for the shuttle stop instrument. The table also includes the reestimated hedonic price regression results. As predicted in Section 4.1.2, MUNI Metro-adjacent bus zones in western San Francisco became more likely to host a shuttle stop as time increased. In Table 6, the coefficient on linear time-trended MUNI Metro-adjacent eligible bus zones interacted with the Easting coordinate is negative, which means that the distance between the easting point and the bus zones hosting a shuttle stop steadily shrank (equivalent to moving westward). Likewise, the same coefficient on thoroughfare-adjacent bus zones interacted with a time trend and the easting coordinate is negative, as likewise, the shuttle stops steadily drifted westward along the thoroughfares. The coefficient on time-trended bus zone lengths is unanticipately negative, but this could be because the largest bus zones were selected first and the companies got less choosy with the desire to expand. These are only a snapshot of the model’s estimates, but they confirm the instrument’s intuition.

The second stage results estimation results indicate three things: the null that the hypothesis is weak can be safely rejected, the original hedonic price regressions understate the shuttle’s hedonic impact, and that the shuttles almost certainly changed market prices by enough to incentivize evictions. The Kleinbergen-Paap Wald F statistic on the instrument is 175.97, well above the Staiger and Stock (1997) rule of thumb of 10 to reject the weak instrument null hypothesis. The hedonic price underestimation in ordinary least squares is likely due to the shuttles congregating in gentrifying areas, which initially tend to have lower-than-median housing prices. Lastly, the

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33East and northing coordinates are used in place of latitude and longitude in the Universal Transverse Mercator (UTM) projected coordinate system, which overlays the earth with unique ellipsoid zones so that distances on the globe can be measured directly in meters. Easting in this case is how many kilometers east the point is from the zone’s point of origin, which is the intersection between the zone’s central meridian and the Equator. Likewise, northing is how many meters north the point is from the zone’s point of origin. UTM is a remarkably accurate system for calculating distances in this way, as one study found that it is accurate to within 9 mm over the entire ellipsoid (Karney (2011)). San Francisco lies in UTM Zone 10 far north of the Equator, so an arbitrary point in the ocean just southwest of the peninsula was chosen as a new point of origin (specifically Easting=543500, Northing=4173500 in UTM Zone 10) and the easting and northing coordinates were recalculated and converted to kilometers so that interaction terms would not become arbitrarily large.
estimates on the shuttle stops show that prices changed by enough to exceed the annual allowable rent increase (Condition 1 6.4% > 2.7%) and the maximum relocation payment per unit (Condition 2 - $32,954.17 > $19,000). Having established that the shuttles changed prices (and presumably rents) by enough to incentivize economic evictions, the paper now proceeds to estimating how evictions changed in response to the shuttles’ price shock.

4.2 Testing for Economic Evictions

Several strategies are used to test for the presence of economic evictions. Two eviction types are investigated: all at-fault evictions and no-fault evictions (Ellis+OMI’s). At-fault evictions are used to test whether landlords use economic evictions to exploit vacancy decontrol. Owner move-in and Ellis Act evictions summed test whether landlords respond to a price shock by withdrawing their units from the market. At-faults and no-faults are not combined because they have very different costs structures and incentives and may in fact be substitutes. Any evidence for economic evictions of either type will be interpreted as evidence in favor of the hypothesis.

The regressions control for changes to rent control and evictions policies over the study’s observational period. These changes can be found in Appendices A.1.1 and Tables B.1 and B.2. Year/month effects control for general policy exposure, but most policies were only applicable to controlled buildings. Each regression thus controls for the policies interacted with rent control status, under the assumption that eviction policy changes are endogenous only the city’s overall eviction rate, but exogenous to changes in any individual building or neighborhood. My key identification assumption in these regressions is that there are no other unobserved shocks to the outcomes coincident with shuttle placement and shuttle placement interacted with rent control status that affected eviction outcomes.

The first series of regressions is performed on an unbalance monthly panel of rental buildings, where the outcome is whether the building had an eviction in a given month ($\text{Eviction}_{it}$) and rent control and shuttle coverage are indicators. This panel observes 36,592 buildings that are commonly used as rentals: apartments, flats, and multi-family dwellings observed for at least a year and up to 126 months. A third series of regressions is performed using an unbalanced yearly panel of all 128,990 residential buildings, including single-family detached homes, because owners are just as free to offer these for rent as apartment landlords.

The third series of regressions are run on a monthly panel of 85 neighborhoods observed for 126 months ($N = 10,710$). This allows credible eviction count estimation, because evictions are highly zero-inflated in the time dimension at the building level. Evictions and building characteristics are aggregated to the neighborhood level, and shuttle and rent control variables are expressed as fraction of buildings covered per neighborhood. Also performed are a series of eviction rate regressions, where the denominator is the number of housing units or residential buildings per neighborhood.

The advantage of the neighborhood panel is that evictions are a rare event on a monthly basis at the building level which is known to be systematically mis-estimated by logistic and linear probability models (King and Zeng (2001)). Aggregating evictions to the neighborhood level smooths out some of the problems associated with estimating rare events. It also permits credible estimation of a Poisson regression on eviction counts. The last advantage is that all the building-level panels are unbalanced, so that a neighborhood-level estimation strategy might better capture area characteristics like how certain tenant demographics cluster together.

However, there are several disadvantages. Many neighborhoods are quite small and somewhat arbitrarily drawn, so the assumption that errors are independent across clusters is hard to sustain. Further, because each cluster (neighborhood) has “only” 126 time periods, any instrumental variables approach might lead to overrejection of the null because of an insufficient number of observations per cluster (Cameron and Miller (2015)). Another disadvantage is that much of the micro variation is lost in aggregation, so the precise relationship between the price shock and the
eviction outcomes is harder to measure. Lastly, neighborhood boundaries are likely influenced by the preexisting housing stock because realtors use them to sell and rent housing, so there is a very uneven housing “mix” across neighborhoods.\textsuperscript{34}

Panel fixed effects and instrumental variable estimates are reported. The instrument is the same as reported in Section \textsuperscript{4.1.2} except that the interaction between rent control and the shuttles could also be endogenous. Shuttles may have favored controlled apartments because technology employees are willing to pay the premium, anticipating that high job security necessitates prolonged tenures. Figure \textsuperscript{5} shows the fraction rent controlled per neighborhood, and a comparison with Figures \textsuperscript{2} and \textsuperscript{4} shows that areas with a high rent control fraction are both well-covered by the shuttles and have many bus zones. Thus, Equation \textsuperscript{[3]} is augmented by interactions with the rent control measure. While in the long-run, rent control status is endogenous to evictions, the lags are so considerable that at the time scale observed in this study, rent control status can be safely treated as exogenous.

\subsection*{4.2.1 Estimating Building-Level Eviction Occurrence}

A panel fixed effects model is employed to estimate the impact of price shocks on evictions at the individual building level. This estimation sample is comprised of 36,592 rental buildings that observed for at least a year that could have at least one rental unit.\textsuperscript{35} Evictions are relatively rare on a monthly basis: a total of 4,987 at-fault and 2,181 no-fault notices over the course of the study period were issued in 3,590 of the in-sample buildings.\textsuperscript{36} This equation takes the form of

$$
Eviction_{it} = \delta_0 + \delta_1 Shuttle_{it} + \delta_2 RentControl_{it} + \delta_3 (Shuttle_{it} \ast RentControl_{it}) \\
+ \delta_4 (Policies_t \ast RentControl_{it}) + \delta_5 OtherTransit_{it} + \delta_6 TimePeriod_t \\
+ \delta_7 Building_i + \delta_8 Nbrhd_i \ast Year_t + \epsilon_{it},
$$

where $Eviction_{it}$ is an indicator for whether an eviction occurred in building $i$ in month $t$. $Shuttle_{it}$ is an indicator for whether the building is within a half-mile of a shuttle stop. $Policies_t$ refers to the changes in eviction policies detailed in Table \textsuperscript{B.1} and are interacted with rent control status, $RentControl_{it}$, which captures how these policies might have had the strongest impact on dampening controlled evictions.\textsuperscript{37} $OtherTransit_{it}$ differs from \textsuperscript{4.1.1} in that it only has measures for distances to the MUNI Metro and interactions with rent control status - all other distance measures are dropped in this specification because they are not time-varying. $TimePeriod_t$ is either a vector of year/month fixed effects in the monthly panel, controlling for month-specific shocks to eviction rates, or a vector of year fixed effects in the yearly panel. $Building_i$ is a vector of building-specific fixed effects to control for all time-invariant building characteristics. Lastly, the disaggregated nature of Equation \textsuperscript{[5]} allows the identification assumption to strengthened by adding $Nbrhd_i \ast Year_t$ to control for neighborhood-specific yearly shocks that might be coincident with shuttle stop placement.

The key variables of interest are $RentControl_{it}$, $Shuttle_{it}$ and the interaction term between the shuttle coverage measure and the rent control measure because it captures how rent-controlled landlords react to increases in market rents. Since the transit amenity’s value should be highest

\textsuperscript{34}It is likely no coincidence that many San Francisco neighborhoods, particularly those southwest of Twin Peaks, were drawn such that they have no multifamily housing units.

\textsuperscript{35}This was defined as all residential buildings that are not government housing or single-family dwellings, condominiums, co-ops, or residential hotels.

\textsuperscript{36}There are many more eviction notices given out in total, as can be seen in Table \textsuperscript{2}. Many of these are in fact for illegal units in the San Francisco’s single-family housing stock, and so are outside the scope of this study.

\textsuperscript{37}For the imposition of relocation payments on owner move-in evictions in 2006 and the extension of relocation payments to all Ellis’d tenants in 2005 seein in Table \textsuperscript{B.2} I create dummy variables also interacted with rent control status for both policy changes.
within the immediate vicinity of a stop, economic evictions occur if this term is positive. Standard errors are clustered at the neighborhood level \[^{[38]}\] and each observation is weighted by its initial number of housing units. Results are reported in Table [7].

### 4.2.2 Estimating Neighborhood-Level Eviction Rates and Counts

The neighborhood level panel is used to estimate both eviction counts and eviction rates. The former is more intuitive and is estimated with a panel fixed effects Poisson model. The latter has the advantage that it can be estimated in a linear panel and identification in the instrumental variables estimation will not draw on the non-linear nature of the equation. The panel fixed effects regression equation takes the form of

$$
Eviction_{it} = \delta_0 + \delta_1 Shuttle_{it} + \delta_2 RentControl_{it} + \delta_3 (Shuttle_{it} \times RentControl_{it}) \\
+ \delta_4 (Policies_{i} \times RentControl_{it}) + \delta_5 OtherTransit_{it} + \delta_6 YYMM_t + \delta_7 Nbrhd_i + \epsilon_{it},
$$

where \(i\) is reindexed to identify the neighborhood. \(Eviction_{it}\) is either the log of the eviction count or the eviction rate that neighborhood \(i\) experiences in month \(t\). \(Policies_{i}\) are the same as reported in Section 4.2.1. \(OtherTransit_{it}\) now includes all the distance measures given in Equation (2) multiplied by the neighborhood’s rent control \(^{[40]}\). This captures how price pressures from other forms of transit influence the rent controlled buildings in neighborhood \(i\). \(Nbrhood_i\) is a vector with a set of neighborhood-specific dummies to control for time-invariant attributes in each neighborhood. The regression also has a set of year/month dummies, denoted with the vector \(YYMM_t\) to control for city-wide time-period specific shocks. The Poisson model includes the units (at-faults) or building counts (no-faults) with the coefficient constrained to one as the exposure variable.

The key variables of interest are again \(RentControl_{it}\), \(Shuttle_{it}\) and the interaction term between the shuttle coverage measure and the rent control measure because it captures how rent-controlled landlords react to increases in market rents. Since the transit amenity’s value should be highest within the immediate vicinity of a stop, economic evictions occur if this term is positive. Reported standard errors are heteroskedasticity and autocorrelation consistent (HAC). The linear regressions are weighted by the initial number of housing units (at-faults) or initial number of buildings (no-faults) per neighborhood. Results are reported in Table [8].

### 5 Results

Key results are found in Tables [7] and [8]. In both the building-level and neighborhood-level ordinary least squares and Poisson fixed effects results, there is no evidence for economic evictions. This is unsurprising given that the endogeneity bias in shuttle locations understates the strength

\[^{[38]}\] While this is something of a strong assumption, it is not unreasonable to assume that buildings are much more independent across neighborhoods than not, while being possibly highly correlated within the same neighborhood.

\[^{[39]}\] The denominator in the rate regressions is total neighborhood housing units for the at-fault estimations and total neighborhood building count for the no-fault estimations.

\[^{[40]}\] As before, this includes information on how far the average condominium is from alternative forms of transit, including to the BART and Caltrain, to the light rail transit stops, and to major north-south thoroughfares. Specifically, these are the distances in miles to the condominium’s nearest BART station, Caltrain station, MUNI Metro station (but not cable cars), and nearest major thoroughfare segment. The major north-south thoroughfares are 19th Ave/State Highway 1 and extensions, US Highway 101 and extensions, I-80, and I-280. I also control for the distance to the central business district, under the assumption from the monocentric city model that prices are highest closest to it, and distance to the geographical center of the city, allowing for the possibility that prices might rise more away from the center (and closer to the coast). Lastly, it includes the count of the number of public transit stops within a half-mile of the condominium.
of the shuttles’ price shock. Rent control does have a higher monthly at-fault eviction rate and count, but does not raise the probability of an at-fault eviction at the building level. It is possible that building fixed effects may not control as well as neighborhood fixed effects for the tenant unobservables that predict higher at-fault eviction rates and counts. In particular, neighborhood character is much more persistent than the month by month composition in tenants in a given building, so that neighborhood fixed effects are more robust to tenant turnover than building fixed effects.

The instrumental variables estimates in all panels show evidence for economic evictions. Assuming that the percent change in rents is the same as the percent change in condominium prices after exposure to a shuttle, Table 7 shows that the monthly probability a controlled building will do a no-fault eviction increases by 0.021% when rents increase by the hedonic value of the shuttles. The yearly probability rises to 0.21%, which is close to what the estimated monthly probability times 12 is (0.00021*12=0.00252). This shows that the finding in favor of economic no-fault evictions is at least somewhat robust to sample composition considerations. As a check that shuttle exposure and evictions are not being mistimed in the yearly panel, I also lag the shuttle variables (and instruments) back a period. The estimates there are not statistically significant, but the signs remain the same across the two specifications.

In the all residence yearly panel, 35,053 buildings are controlled. From Table 8 the prediction would be that if there were a uniform rent hike equivalent to what the shuttles induce, the yearly number of buildings with no-fault evictions would increase by 35,053*0.0023=80.55.

Results from the monthly neighborhood panel in Table 8 shows evidence for at-fault economic evictions. The second-stage IV results show that neighborhood at-fault eviction rates and eviction counts increase with exposure to a rent shock. The median neighborhood has 6,568 controlled housing units. Multiplying that number by the estimated eviction rate indicates that there were an additional 6.6 at-fault evictions per neighborhood per month after rents rose by about 6.4%. If there were a uniform rent hike equivalent to the one induced by the shuttles, there would be an additional 6,732 vacancies per year. The IV Poisson results confirm that the change in counts in controlled units after a price shock is statistically significant. While the neighborhood and building panels are not in agreement on the significance of the variables of interest, both show compelling evidence that landlords engage in unit turnover and market exit when rents rise.

6 Discussion

This paper shows that economic evictions occur in at least certain circumstances, in spite of being assumed away in all previous rent control studies. The question now is: what does this mean for the rent control literature and rent control policy?

There are two aspects that are particularly relevant. The first is how evictions change rent control’s distributional impact. Rent control is usually justified as a policy intended to subsidize poor resident’s desire not to be unduly priced out of their homes and neighborhoods. Yet, rent control’s beneficiaries do not seem to be disproportionately low-income and minority (Navarro (1985); Sims (2007); Turner and Malpezzi (2003)). Glaeser (2003) and Gyourko and Linneman (1989) point out that controlled housing is likely non-price rationed because its supply is highly inelastic and price signals cannot be used to otherwise clear the market. Landlords are thus empowered to lean on their personal biases, so that on net, poor families do not seem more likely to have controlled units. However, the results here suggest that a contributing reason could be landlords seizing on the greater propensity for poor tenants to experience failures to pay rent to achieve an eviction. An uncontrolled landlord looking to avoid untimely search costs might be more willing to overlook the occasional late payment. Secondly, as rising rents shrink the controlled housing supply, poor and minority tenants might be steadily priced out by the controlled unit premium. Counterbalancing
these pressures is that rent control is confined to older, likelier shabbier buildings, which are more likely to command lower prices in a heterogeneous housing market. The literature on rent control and landlord and tenant maintenance offers mixed evidence for the quality of controlled buildings (Moon and Stotsky (1993); Gyourko and Linneman (1990); Arnott and Shevyakhova (2014); McFarlane (2003); Kutty (1996)), so it is unclear as of this writing what the distributional equilibrium would be when evictions are factored in.

The net effect might be exactly what is observed in other studies: these effects roughly cancel out so that controlled units are not unduly allocated to poor residents. Since no tenant demographics study exists in the literature on San Francisco, it is hard to extrapolate. Unfortunately, the literature is not extensive enough to rule out the possibility that in a city experiencing strong rent pressures, controlled unit allocation to poor residents has a negative long-term outlook. The estimated 6,732 extra controlled at-fault evictions that would occur under a uniform rent increase are at least that many residents who would be displaced without relocation payments. Given the tightness of the housing market in San Francisco, many would be unable to find new controlled housing. Desmond (2012) shows in a demographic study of evictions in an uncontrolled market that at-fault evictions are disproportionately happen to poor, female, and minority tenants. Rent control thus does not seem to retain many of the people it seeks to help, and circumstantial evidence shows that one of its perverse incentives targets the very people it seeks to aid.

The other discussion point is the housing market distortions engendered by economic at-fault and no-fault evictions. It is beyond the scope of this paper as to whether the greater tenant turnover from tactical at-faults counterbalances the distortions generated by the short-to-medium term decreased housing supply from no-faults. The roughly estimated 80 extra no-fault evictions per year due to rising rents understates the how much total housing would be withdrawn. Each owner move-in withdraws one unit and each Ellis Act withdraws them all, and are observed to occur on a building-by-building basis in about equal numbers. The median controlled building has three units, so assuming 40 additional owner move-ins and 40 additional Ellis Act evictions mean that the total number of extra units withdrawn from a uniform 6.4% rent hike would be more like 160 units per year.\footnote{Not a large number on a yearly basis, but the long waiting periods mean that the number of units that have to sit out the market accumulates.} This paper can be interpreted very tentatively as vindicating Basu and Emerson (2003)’s link between rising rents and decreased controlled housing supply.\footnote{Adding to their model the fact that all controlled cities limit adding new controlled units, a feedback loop might exist between rising rents and no-fault evictions. As rents rise, the prospective tenant pool gets weighted towards long-stayers, which prompts some landlords to withdraw rather than face losses. The shrinking controlled unit supply in turn exacerbates rationing, causing the base rents for vacant units to rise, which again distorts the prospective tenant pool towards the longest stayers. This in turn would prompt a fresh wave of landlords to seek market exit.}

In the long-run, economic evictions might cause the controlled housing stock to decrease to zero. Without policy intervention, this feedback loop could well intensify, depending on the prospective tenant pool’s composition. This in turn could create an upward distributive skew in controlled units. If the tenants most willing to pay the rent premium are wealthier, this group would be the increasingly favored beneficiary of rent control.

On the whole, rent control’s incentive structure for economic evictions threaten to undermine the stated premise for the policy intervention. This is true both in the observed results reported here, given that evictions are assumed to be undesirable outcomes, but also in considerations downstream from evictions, such as housing availability and distributive impacts.

\footnote{This does not include the meager number of demolitions permitted on inhabited buildings per year, but undoubtedly, these might also move with prices.}

\footnote{Their key assumption is that landlords are monopolistic. Whether the housing market in San Francisco is monopolized is beyond the scope of this paper.}
7 Conclusion

This paper tested the widespread assumption in the rent control literature that economic evictions do or cannot occur under these policy regimes. Exploiting unique properties of San Francisco, namely an identifiable, locally differentiated change in prices, eviction responses to free market rent changes were tested. Landlords were found to engage in short-term unit-clearing evictions that kept their units in the controlled market and also evictions that allowed them to begin the process of switching to the uncontrolled market, even at the expense of decreasing their medium-term housing supply. A uniform rent increase for vacant units of about 6.4% would yield 6,732 additional short-term unit-clearing evictions and 160 unit-withdrawing evictions in the controlled market per year. In light of these findings, future research could revisit the distributional and housing market aspects of rent control policy. Policymakers looking to protect the controlled housing supply would be advised to make the provisions for market exit ("no-fault" evictions) more expensive. However, policymakers looking to ensure affordable and available housing would do well to recognize that economic evictions are a feature, not a bug, of rent control’s design.
References


# TABLE 1
The 15 Grounds for “Just Cause” Eviction in San Francisco

| Reason                                                                 | Type       | Relocation Payments? | Deed Restrictions?
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-payment or habitual late payment on rent</td>
<td>At-Fault</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Breach of lease</td>
<td>At-Fault</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Nuisance or substantial damage to unit</td>
<td>At-Fault</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Conducting Illegal Actions in Unit&lt;sup&gt;b&lt;/sup&gt;</td>
<td>At-Fault</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Tenant refuses to quit after tenancy ends</td>
<td>At-Fault</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Tenant refuses to grant landlord lawful access</td>
<td>At-Fault</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Sole remaining tenant is unapproved subtenant</td>
<td>At-Fault</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Owner repossession for primary residence (OMI)</td>
<td>No-Fault</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Conversion of units to condominiums&lt;sup&gt;c&lt;/sup&gt;</td>
<td>No-Fault</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Removal of all units from rental use (Ellis Act)</td>
<td>No-Fault</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Demolition of units</td>
<td>No-Fault</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Substantial Rehabilitation</td>
<td>No-Fault</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>“Good Samaritan” status has expired&lt;sup&gt;d&lt;/sup&gt;</td>
<td>No-Fault</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Temporary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead abatement</td>
<td>No-Fault</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Capital improvements</td>
<td>No-Fault</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Table 1 enumerates the reasons a landlord may reclaim a rent-controlled unit. The “At-Fault” evictions refer to the 7 ways a tenant may be evicted for breaching the rental contract in some fashion, and “No-Fault” refers to the 8 ways a tenant may be evicted even if not in breach of the lease.

<sup>a</sup> These include restrictions on how long the landlord must wait before being able to return the units to market, or if the unit is demolished, how long the parcel will remain under the rent ordinance before its provisions are lifted. These range from 3 years for an OMI to 10 years for an Ellis Act eviction.

<sup>b</sup> Conversion of rental units to condominiums was previously possible via a permit lottery but was suspended in 2013. However, the city only permitted a handful of these per year prior to its formal suspension.

<sup>c</sup> If the tenant is convicted of a crime, the notice to quit is unconditional.

<sup>d</sup> “Good Samaritan” status is temporary housing for tenants fleeing a natural disaster.

Source: San Francisco Administrative Code Chapter 37, Section 9(a)(1)-9(a)(16).
# TABLE 2
Yearly Counts of “Just-Cause” Eviction Notices by Eviction Type: 2004-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Owner Move-In</th>
<th>Demolitions&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Ellis Act&lt;sup&gt;a&lt;/sup&gt;</th>
<th>At-Fault</th>
<th>TOTAL</th>
<th>Rental CPI&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>275</td>
<td>79</td>
<td>95</td>
<td>725</td>
<td>1174</td>
<td>2.9%</td>
</tr>
<tr>
<td>2004</td>
<td>263</td>
<td>49</td>
<td>238</td>
<td>969</td>
<td>1519</td>
<td>2.6%</td>
</tr>
<tr>
<td>2005</td>
<td>200</td>
<td>37</td>
<td>246</td>
<td>1270</td>
<td>1753</td>
<td>2.9%</td>
</tr>
<tr>
<td>2006</td>
<td>180</td>
<td>33</td>
<td>197</td>
<td>1306</td>
<td>1716</td>
<td>3.4%</td>
</tr>
<tr>
<td>2007</td>
<td>156</td>
<td>31</td>
<td>199</td>
<td>1499</td>
<td>1885</td>
<td>4.1%</td>
</tr>
<tr>
<td>2008</td>
<td>132</td>
<td>28</td>
<td>170</td>
<td>1422</td>
<td>1752</td>
<td>3.5%</td>
</tr>
<tr>
<td>2009</td>
<td>103</td>
<td>27</td>
<td>36</td>
<td>1321</td>
<td>1487</td>
<td>2.2%</td>
</tr>
<tr>
<td>2010</td>
<td>116</td>
<td>25</td>
<td>58</td>
<td>1444</td>
<td>1643</td>
<td>0.2%</td>
</tr>
<tr>
<td>2011</td>
<td>107</td>
<td>39</td>
<td>45</td>
<td>1564</td>
<td>1745</td>
<td>1.7%</td>
</tr>
<tr>
<td>2012</td>
<td>154</td>
<td>32</td>
<td>77</td>
<td>1611</td>
<td>1874</td>
<td>2.6%</td>
</tr>
<tr>
<td>2013</td>
<td>230</td>
<td>86</td>
<td>180</td>
<td>1903</td>
<td>2399</td>
<td>2.7%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1641</td>
<td>377</td>
<td>1446</td>
<td>14309</td>
<td>18957</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

Table 2 presents counts of eviction notices for all at-fault evictions and the three largest categories of no-fault evictions in San Francisco from 2004-2013. For owner move-in and at-fault evictions, these are generally applied to only one unit. For demolitions and Ellis Act evictions, these almost exclusively occur for an entire building, so potentially many units (and tenants) are impacted. There are three other categories of no-fault evictions, but none of these have more than 30 evictions over the course of the study period.

<sup>a</sup> These are counts of buildings where an Ellis Act or demolition notice to quit was given. The total number of people and units affected is a few multiples of these counts.

<sup>b</sup> “Rental CPI” is the annual percent change in the Consumer Price Index for the Rent of Primary Residence in the San Francisco-Oakland-San Jose, California Combined Metropolitan Statistical Area reported by the Bureau of Labor Statistics.

Source: The Rent Board of the City and County of San Francisco.
Table 3 presents averages of key characteristics of the housing stock in San Francisco for three selected years. The sample comprises all buildings in San Francisco in the years specified with a housing property code that indicates it is a condominium, house, apartment building, flat, or townhome, summed by year in Row 1. Condominiums are denoted as buildings in their own right, because they are recorded individually by the city even if they are in a multi-unit building. Average Year Built (Row 2) is the mean year built by property. Rows 4-9 give the fraction of housing units that are rent-controlled; the fraction that are within a half-mile of a shuttle stop as of June of that year; the fraction that are condominiums; apartment buildings; residences; and the fraction that have no-fault evictions, respectively.

<table>
<thead>
<tr>
<th></th>
<th>2003</th>
<th>2008</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Housing Units</td>
<td>377,182</td>
<td>389,787</td>
<td>405,021</td>
</tr>
<tr>
<td>Average Year Built</td>
<td>1935</td>
<td>1937</td>
<td>1938</td>
</tr>
<tr>
<td>As Percent of Total Housing Stock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rent-Controlled</td>
<td>55.5%</td>
<td>53.5%</td>
<td>52.0%</td>
</tr>
<tr>
<td>Within 1/2 Mile of Shuttle Stop</td>
<td>0.0%</td>
<td>56.5%</td>
<td>59.7%</td>
</tr>
<tr>
<td>Condominiums</td>
<td>9.5%</td>
<td>12.1%</td>
<td>14.2%</td>
</tr>
<tr>
<td>Apartment Buildings</td>
<td>57.5%</td>
<td>56.2%</td>
<td>55.3%</td>
</tr>
<tr>
<td>Residences</td>
<td>29.7%</td>
<td>28.7%</td>
<td>27.7%</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td></td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td>Sales Price</td>
<td>$ 1,750,049</td>
<td>$ 797,900</td>
<td></td>
</tr>
<tr>
<td># of Baths</td>
<td>1.63</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td># of Beds</td>
<td>1.87</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Sq. Ft.</td>
<td>1170.32</td>
<td>1096</td>
<td></td>
</tr>
<tr>
<td>Year Built</td>
<td>1975.9</td>
<td>1996</td>
<td></td>
</tr>
<tr>
<td>Distance to the Central Business District (mi.)</td>
<td>2.12</td>
<td>1.61</td>
<td></td>
</tr>
<tr>
<td>Distance to BART (mi.)</td>
<td>1.03</td>
<td>0.88</td>
<td></td>
</tr>
<tr>
<td>Distance to CalTrain (mi.)</td>
<td>1.71</td>
<td>1.60</td>
<td></td>
</tr>
<tr>
<td>Distance to MUNI (mi.)</td>
<td>0.59</td>
<td>0.40</td>
<td></td>
</tr>
<tr>
<td>Distance to Thoroughfare (mi.)</td>
<td>0.45</td>
<td>0.33</td>
<td></td>
</tr>
<tr>
<td>Distance to Any Company Shuttle (mi.)</td>
<td>1.64</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Within a Half-Mile of Shuttle</td>
<td>0.47</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 presents summary statistics on housing characteristics of condominiums sold in San Francisco between July 2003 and December 2013. The sample is defined as single-use, single-family condominiums with no more than 3.5 bathrooms and 4 bedrooms and a minimum of 291 square feet. “Within a Half-Mile of Shuttle” is coded 0/1 in the underlying data, so that the mean of “Within a Half-Mile of Shuttle” represents the fraction across the entire time period of shuttles that were within a half mile of a shuttle stop.
TABLE 5
Hedonic Price Regression on Condominium Sales: July 2003-December 2013

<table>
<thead>
<tr>
<th>Sales Price in $2013</th>
<th>OLS</th>
<th>Quantile Reg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Linear</td>
<td>Log</td>
</tr>
<tr>
<td></td>
<td>b/(se)</td>
<td>b/(se)</td>
</tr>
<tr>
<td>Shuttle</td>
<td>-14,746.89</td>
<td>0.025†</td>
</tr>
<tr>
<td>(24661.73)</td>
<td>(0.0149)</td>
<td>(3,248.33)</td>
</tr>
<tr>
<td>Sq. Ft</td>
<td>692.21**</td>
<td>0.0006**</td>
</tr>
<tr>
<td>(18.04)</td>
<td>(0.00001)</td>
<td>(6.86)</td>
</tr>
<tr>
<td>Adj R²</td>
<td>0.47</td>
<td>0.66</td>
</tr>
<tr>
<td>N</td>
<td>30,150</td>
<td>30,150</td>
</tr>
</tbody>
</table>

Distance Controls  Y Y Y Y
Other Property Controls Y Y Y Y
Month Dummies Y Y Y Y
Year Dummies Y Y Y Y
Neighborhood Dummies Y Y Y Y
Zone Dummies Y Y Y Y

The dependent variable in Table 5 is the reported sales price for a single-family, single-use condominium in 2013 dollars. Point estimates are obtained by regressing on an indicator variable for whether the condominium is within a half-mile of a shuttle stop (\(1\{\text{Shuttle}\}\)), as well as other transit/location controls, property characteristics, neighborhood effects, indicators for the condominium’s zoning area, and sales year and month effects. Distance controls include the distance to the nearest north/south thoroughfare, BART station, Caltrain station, MUNI Metro light rail station, city geographical center, and the central business district, as well as indicators for being a half mile within each point/transit node. Other property controls include the number of beds, the number of baths (including half-baths), the number of public bus stops within a half mile, and an indicator for whether the condominium is brand-new. Zone controls refer to various historic and restricted development districts throughout the city as defined by the City of San Francisco Planning Department.

Standard errors robust to spatial heteroskedasticity and autocorrelation are reported in parentheses. Spatial correlation is limited to properties within a half-mile of condominium \(i\) and lags are truncated to two years.

† p<0.10, * p<0.05, ** p<0.01.
### TABLE 6

1st and 2nd Stage IV Results for Hedonic Price Regressions

<table>
<thead>
<tr>
<th>Outcome</th>
<th>1{Shuttle}</th>
<th>Price</th>
<th>Ln(Price)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>b/(se)</td>
<td>b/(se)</td>
<td>b/(se)</td>
</tr>
<tr>
<td>Throughfare-Adj. BZ<em>East</em>t</td>
<td>-0.0010**</td>
<td>32,954.17**</td>
<td>0.064**</td>
</tr>
<tr>
<td></td>
<td>(0.0005)</td>
<td>(15988.24)</td>
<td>(0.015)</td>
</tr>
<tr>
<td>Metro-Adj. BZ<em>East</em>t</td>
<td>-0.0013**</td>
<td>690.70**</td>
<td>0.001**</td>
</tr>
<tr>
<td></td>
<td>(0.0006)</td>
<td>(18.00)</td>
<td>(0.00001)</td>
</tr>
<tr>
<td>Length*t</td>
<td>-0.00005***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.00001)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>30,150</td>
<td>30,150</td>
<td>30,150</td>
</tr>
<tr>
<td>Adj R²</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wald F statistic</td>
<td>175.97</td>
<td>175.97</td>
<td></td>
</tr>
</tbody>
</table>

| Other Bus Zone Characteristics | Y | N | N |
| Other Distance Controls | Y | Y | Y |
| Other Property Controls | Y | Y | Y |
| Month Dummies | Y | Y | Y |
| Year Dummies | Y | Y | Y |
| Neighborhood Dummies | Y | Y | Y |
| Zone Dummies | Y | Y | Y |

Table 6 reports regression results for the first and second stage of the instrumental variable regression described in Section 4.1.2. The first stage results in the left panel estimate the model given in Equation (3), and also includes all controls specified in Equation 2. The outcome variable in the first-stage regression is an indicator variable for whether the condominium is within a half-mile of a shuttle stop ("1\{Shuttle\}"). The second stage regresses condominium sales prices (expressed in 2013 dollars) on fitted values for 1\{Shuttle\} and also includes all other controls described in Equation (2). "Thoroughfare-Adj. BZ*North*t" is the spatially-weighted fraction of nearby bus zones within a half-mile of a thoroughfare times nearby bus zones’ average UTM Northing coordinate times a monthly linear time trend. “Metro-Adj. BZ*East*t” is the spatially-weighted fraction of nearby bus zones within a half-mile of a thoroughfare times nearby bus zones’ average UTM Easting coordinate times a monthly linear time trend. “Length*t” is nearby bus zones’ average length times a monthly linear time trend.

a “Other Bus Zone Characteristics” include the thoroughfare-adjacent measure times the UTM Northing coordinate times year dummies, the thoroughfare-adjacent measure times the UTM Easting coordinate times year dummies, the metro-adjacent measure times the UTM Northing coordinate times year dummies, the metro-adjacent measure times the UTM Easting coordinate times year dummies, the average bus zone length measure times year dummies, the thoroughfare-adjacent measure times the UTM Northing coordinate times year dummies, and all the above measures not otherwise listed in the table times monthly linear time trends instead of by year dummies.

Standard errors robust to spatial heteroskedasticity and autocorrelation are reported in parentheses. Spatial correlation is limited to properties within a half-mile of condominium i and lags are truncated to two years.

* p<0.01, ** p<0.05, *** p<0.01.
Table 7 displays the panel fixed effects and instrumental variable estimates for building-level eviction probabilities of an at-fault eviction and no-fault eviction for the stated time period. Point estimates are obtained by estimating coefficients for the model given in Equation (5). In the monthly panel, all three variables of interest are indicators for the presence of rent control, being within a half-mile of a shuttle, and the interaction between the two. In the yearly panel, Shuttle\textsubscript{it} is the fraction of year t that the building was adjacent to a shuttle stop. Columns (5), (6), (11), and (12) lag the shuttle and its interaction back one period as a precaution against mis-timing between the observed eviction and shuttle exposure. “Metro Distance Controls” include the distance in kilometers to the nearest MUNI Metro stop, an indicator for being within a half-mile of a MUNI Metro stop, and the interaction of both with the rent control indicator. “Policy Controls” are each policy given in Table B.1 interacted with the building’s rent control indicator. Cluster-robust standard errors at the neighborhood level are reported in parenthesis.

* p<0.10, ** p<0.05, *** p<0.01.

### Panel Fixed Effects Estimates

<table>
<thead>
<tr>
<th></th>
<th>Monthly Panel</th>
<th>Yearly Panel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>At-Fault b/se</td>
<td>No-Fault b/se</td>
</tr>
<tr>
<td>(t)</td>
<td>(t-1)</td>
<td></td>
</tr>
<tr>
<td>Rent Control</td>
<td>0.0002</td>
<td>-0.0002**</td>
</tr>
<tr>
<td></td>
<td>(0.0007)</td>
<td>(0.0001)</td>
</tr>
<tr>
<td>Shuttle</td>
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<td>0.00004*</td>
</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.00002)</td>
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<tr>
<td>Interaction</td>
<td>0.0001</td>
<td>0.00005</td>
</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.00005)</td>
</tr>
<tr>
<td>Adj R²</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>F</td>
<td>5.35</td>
<td>3114.59</td>
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### IV Estimates

<table>
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<tr>
<th></th>
<th>Monthly Panel</th>
<th>Yearly Panel</th>
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<tbody>
<tr>
<td></td>
<td>At-Fault b/se</td>
<td>No-Fault b/se</td>
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<td>(t)</td>
<td>(t-1)</td>
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</tr>
<tr>
<td>Rent Control</td>
<td>0.0002</td>
<td>-0.00014**</td>
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<tr>
<td></td>
<td>(0.0008)</td>
<td>(0.0001)</td>
</tr>
<tr>
<td>Shuttle</td>
<td>0.0006</td>
<td>0.0001*</td>
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<tr>
<td></td>
<td>(0.0004)</td>
<td>(0.0001)</td>
</tr>
<tr>
<td>Interaction</td>
<td>-0.0007</td>
<td>0.0002**</td>
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<tr>
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<td>(0.0005)</td>
<td>(0.0001)</td>
</tr>
</tbody>
</table>

<table>
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<th>N</th>
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<td>Y</td>
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<tr>
<td>Building Fixed Effects</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
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<td>Metro Distance Controls</td>
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<tr>
<td>Policy Controls</td>
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<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Table 7 displays the panel fixed effects and instrumental variable estimates for building-level eviction probabilities of an at-fault eviction and no-fault eviction for the stated time period. Point estimates are obtained by estimating coefficients for the model given in Equation (5). In the monthly panel, all three variables of interest are indicators for the presence of rent control, being within a half-mile of a shuttle, and the interaction between the two. In the yearly panel, Shuttle\textsubscript{it} is the fraction of year t that the building was adjacent to a shuttle stop. Columns (5), (6), (11), and (12) lag the shuttle and its interaction back one period as a precaution against mis-timing between the observed eviction and shuttle exposure. “Metro Distance Controls” include the distance in kilometers to the nearest MUNI Metro stop, an indicator for being within a half-mile of a MUNI Metro stop, and the interaction of both with the rent control indicator. “Policy Controls” are each policy given in Table B.1 interacted with the building’s rent control indicator. Cluster-robust standard errors at the neighborhood level are reported in parenthesis.

* p<0.10, ** p<0.05, *** p<0.01.
### TABLE 8

Neighborhood-Level Eviction Counts and Rates: July 2003-December 2013

<table>
<thead>
<tr>
<th>Linear Panel FE</th>
<th>2nd-Stage IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel Fixed Effects</td>
<td>At-Fault No-Fault</td>
</tr>
<tr>
<td></td>
<td>b/se</td>
</tr>
<tr>
<td>Rent Control</td>
<td>0.074*</td>
</tr>
<tr>
<td></td>
<td>(0.028)</td>
</tr>
<tr>
<td>Shuttle</td>
<td>0</td>
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<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td>Interaction</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
</tr>
<tr>
<td>Adj R²</td>
<td>0.17</td>
</tr>
<tr>
<td>F</td>
<td>7.92</td>
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</table>

<table>
<thead>
<tr>
<th>Poisson Panel FE</th>
<th>2nd-Stage IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel Fixed Effects</td>
<td>At-Fault No-Fault</td>
</tr>
<tr>
<td></td>
<td>b/se</td>
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<tr>
<td>Rent Control</td>
<td>23.08**</td>
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<tr>
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<td>(4.60)</td>
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<tr>
<td>Margin:</td>
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<td>(4.17)</td>
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<tr>
<td>Shuttle</td>
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<tr>
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<td>(0.349)</td>
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<tr>
<td>Margin:</td>
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<tr>
<td></td>
<td>(0.186)</td>
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<tr>
<td>Interaction</td>
<td>-0.440</td>
</tr>
<tr>
<td></td>
<td>(0.406)</td>
</tr>
</tbody>
</table>

| Year/Month Fixed Effects | Y | Y |
| Neighborhood Fixed Effects | Y | Y |
| Policy Controls | Y | Y |
| Other Transit Controls | Y | Y |

Table 8 displays the linear and Poisson panel fixed effects estimates for monthly neighborhood eviction rates and counts, respectively. Point estimates are obtained by estimating coefficients for the model given in Equation (??). Standard errors in the linear panel are heteroskedastic and autocorrelation consistent (HAC), and standard errors in the Poisson model are heteroskedasticity cluster-robust at the neighborhood level. In the 2nd-Stage IV regressions, the reported F-statistic is the Kleinbergen-Paap Wald F, which is the weak instrument test statistic when errors are cluster-robust to heteroskedasticity and correlation across observations.

† p<0.10, * p<0.05, ** p<0.01.
Figure 1: Annual Percent Changes in Evictions Track Economic Changes: 2004-2013

Note: Recession shaded in to cover 2008 and 2009, but this is for simplicity of comparison. In reality, the Great Recession extended from December 2007 to June 2009.
Figure 2: Evolution of Apple, Electronic Arts, Facebook, and Google Commuter Shuttle Stops, September 2004-December 2013.
Figure 3: Overall Spatial Distribution of Condominiums

Overall Condominium Counts by Neighborhood

- 0
- 1 - 200
- 201 - 500
- 501 - 1000
- 1001 - 2000
- 2001 - 10000
Figure 4: San Francisco Transit Networks as of September 2004
Figure 5: Non-Condominium Residential Buildings Rent Controlled By Neighborhood

Fraction Rent Controlled: July 2003
- 0%
- >0% - 10%
- >10% - 25%
- >25% - 50%
- >50% - 75%
- >75% - 100%
Figure 6: Growth of Shuttle Stops Along Thoroughfare-Adjacent Bus Zones, December 2004-December 2013.
Figure 7: Growth of Shuttle Stops Along MUNI Metro-Adjacent Bus Zones, December 2004-December 2013.
Policy Appendix

A Rent Control and Eviction Policies

A.1 San Francisco

A.1.1 San Francisco Rent Control and Evictions Policies

San Francisco’s rent control system was inaugurated in 1979 by The Residential Rent Stabilization and Arbitration Ordinance (Chapter 37 of the San Francisco Administrative Code), which mandated (with certain exceptions) that all buildings that were issued a certificate of occupancy on or before June 13, 1979 and have two or more residential units are subject to the Rent Ordinance. The original rent control law was intended only as an emergency measure and was set to expire within 15 months, but remains in force to this day.

Landlords have several ways to increase the yearly rent on a preexisting tenancy. Landlords are entitled to raise rents each year at 60% of the rate of inflation, but can “bank” these allotted increases for several years. They can costlessly petition the San Francisco Rent Board (the adjudicating body) to increase rent based on capital improvements, greater than normal operating expenses, electricity and gas costs, or extra maintenance expenses. They may also petition for a rent increase based on rents on a comparable unit. Without petitioning, they may increase rents based on general obligation bonds that are charged through their property tax bills and water system improvement revenue bonds that are charged through the water bill. Collectively, these provisions permit the landlord to pay any fixed costs onto the tenants.

Evictions from controlled units are proscribed by the City of San Francisco to only 15 categories of “just-cause” evictions, most of which are at-fault evictions for habitual late payment of rent, nuisance, and breaches of the lease as discussed in Section 1.1. The “no-fault” evictions are condominium conversion (almost never used), owner move-ins (OMI’s), demolitions, substantial rehabilitation, and Ellis Act evictions.

In the case of an OMI, there are several stipulations. The alleged beneficiary must move in after the notice to quit has been given. Landlords cannot re-rent the units to new tenants for a period of three years after the eviction, or if they do so, must first reoffer the unit to the evicted tenant and then a new tenant if the original tenant cannot be found at the original base rent with allowable increases factored in. Further, once a landlord recovers a unit for repossession, they cannot subsequently reclaim any other unit in the building for personal use.

Evictions under the Ellis Act are the second most common no-fault eviction. The Ellis Act was passed as a response to *Nash v City of Santa Monica* (37 Cal. 3d 97 (1984)), where the California Supreme Court ruled that cities had a reasonable right to prohibit landlords from withdrawing their

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43 Exceptions include hotels, motels, and other commercial housing units; non-profit cooperatives; hospitals, monasteries, and convents; and certain government-run dwelling units. Exceptions are granted for certain buildings that are at least 50 years old and have undergone substantial rehabilitation since June 13, 1979, and the landlord has successfully filed a petition for exemption. No hard numbers on how many buildings are exempt on this basis, but there were only 6 buildings that issued no-fault evictions notices for substantial rehabilitation during the study period, so it seems unlikely that there are meaningful numbers of age- and size-appropriate buildings with this exemption.

44 San Francisco Administrative Code §37.2(r)

45 San Francisco Administrative Code §37.1(b)(6)

46 San Francisco Administrative Code §37.3 et seq.

47 In reality, the number is 16, but demolitions are listed twice over a small legal distinction so for the purposes of this paper, all demolitions have been lumped together under one “just-cause” eviction.

48 San Francisco Administrative Code §37.9(a)(8)(v).

49 San Francisco Administrative Code §37.9B

50 San Francisco Administrative Code §37.9(a)(8)(vi).
units from the rental market. The Ellis Act prohibits local entities from compelling landlords to keep their units on the market, but does allow cities to impose relocation costs on Ellis Act evictees. Further, the Ellis Act does not prohibit cities from imposing certain conditions on property use after it has been utilized.

Ellis Act evictions allow a landlord to exit the rental market and evict all the tenants, but they come with substantial restrictions. A landlord cannot return a property to market for a period of 5 years, or the units must be offered at the prevailing base rate and subsequent allowable increases that the previous tenant would have paid but for the eviction. More generally, if they choose to return the units to market within 10 years, they must first offer the vacated units to the previous tenants at the same base rent with allowable intervening increases. Further, within the first five years of the notice to withdraw the units under the Ellis Act, a landlord demolishes and rebuilds any units on the same property and offers the new units for rent, the new units are subject to the same restrictions as the old ones, including rent regulation until the expiry of the 5 year period. Offering for rerental within 2 years gives the City the right to sue for civil damages on behalf of the displaced tenants.

San Francisco has several policies in place to discourage economic no-fault evictions. Beneficiaries of OMI's must live in their units for at least 36 months, preventing landlords from quickly taking advantage of vacancy decontrol to earn a higher rent on the unit. Demolitions must attain a permit before a notice to quit can be issued. Ellis Act evictions are subject to especially tough provisions designed (at least implicitly) to deter taking advantage of vacancy decontrol, such as forbidding re-rental of Ellis Act withdrawn units for at least 5 years, unless the landlord is willing to offer a maximum rent of what a tenant would have paid if they had never been evicted. Evicted tenants get a right of first refusal. If offered for re-rental within 10 years, evicted tenants get a right of first return at the rent they would have paid for the first five years had they never been evicted. Lastly, all no-fault evictions are subject to relocation payments of $5,555 for each tenant as of 2015, with surcharges for elderly, disabled, and minor tenants.

A.1.2 Estimating the Cost of An Eviction in San Francisco

Clearly, as an economic eviction, owner move-ins are going to be most compelling for controlled two unit properties, where one unit can be held by the family and the landlord can wait for another opportunity to clear the other unit. Ellis Act evictions, on the other hand, can be used by the landlord to clear all occupants of a building, but a landlord faces a much longer transition period before the units could conceivably be demolished and rebuilt. Thus, both eviction types will be tested because they offer advantages and disadvantages to each prospective landlord looking to exit the controlled market.

Between July 2003 and December 2013, the city passed a series of laws that generally made it more difficult or expensive to do an eviction. These laws can be grouped into two categories: legal restrictions on issuing a notice to quit and relocation payments for no-fault evictions. In Appendix A Table B.1 lists all of the laws passed during this period restricting a landlord’s ability to issue an eviction notice and Table B.2 details the relocation payments landlords were mandated to pay in the case of a no-fault eviction.

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51 San Francisco Administrative Code §37.9A(a) et seq.
52 San Francisco Administrative Code §37.9A(c) et seq.
53 San Francisco Administrative Code §37.9A(b)
54 San Francisco Administrative Code §37.9A(d) et seq.
55 San Francisco Administrative Code §37.9(a)(8)(i) and §37.9(a)(8)(ii)
56 San Francisco Administrative Code §37.9(a)(10)
Court expenses are difficult to estimate directly, and a systematic analysis is beyond the scope of this paper. However, in addition to legal fees and time spent in court, the landlord must pay a $240 filing fee for a “unlawful detainer” proceeding to begin. Landlords can generally expect a satisfactory outcome from issuing a notice to quit. A study commissioned by the San Francisco Board of Supervisors found that 82.1% of tenants relocated after an unlawful detainer suit (Brennan (2014)). Since landlords can expect to win the great majority of cases, and even be compensated by the tenant for the court fees and expenses, this paper will assume that court expenses are immaterial when establishing the eviction cost baseline.

Limits on eviction notices are fairly mild over this period, but the relocation payments can be a substantial portion of the cost of evicting a tenant. Until August 2004, relocation payments were only for low-income, disabled, or elderly tenants in an Ellis Act eviction and a modest $1,000 for an owner move-in. Starting in August 2004, Ellis Act relocation payments were expanded to all tenants, and in August 2006, all other no-fault evictions had relocation payments that could total up to over $19,000. All analyses will control for these costs and policy changes, under the theory that they will both impact the targeted eviction rate directly and possibly induce a landlord to substitute between eviction types.

These relocation costs and waiting periods allow pricing the cost of an eviction to the landlord. At a minimum, an uncontested March 2013 OMI eviction of one, non-elderly, -minor, or -disabled tenant would cost a landlord $5,207 in relocation fees, and if the unit was not then rented to a relative, 36 months of foregone rent. The American Community Survey estimated that the median contract rent in San Francisco in 2013 was $1,440. Under rent control and prevailing inflation rates, that number would be essentially unchanged through 2016, such that the net present value in 2013 dollars of the foregone rent would be about $50,879.41. Thus, an uncontested OMI eviction costs can range anywhere from $5,207 to $69,986.41, so for simplicity, the midpoint between these values is assumed to be close to the average cost: $37,596.71. Uncontested at-fault evictions will be much cheaper, as they have no relocation costs and no waiting periods, and uncontested Ellis Act evictions will cost more in foregone rents.

A.2 California

A.2.1 California State Laws

Much of eviction and rent control law is determined by state statutes. The vacancy decontrol-recontrol (hereafter just vacancy decontrol) provision and the new building exemption are enshrined into state law under the Costa-Hawkins Act. Costa-Hawkins Act accomplished two aims: it explicitly forbade the imposition of new tenancy rent control laws and grandfathered in the preexisting ones. Landlords of buildings built after February 1, 1995 were given an inalienable right to set the “initial and all subsequent rental rates” For units already covered with rent control, it enshrined vacancy-decontrol as the right of landlords to freely set the initial rent.

Non-rent controlled evictions are governed by the California Civil Code, §§ 1942-1946.1, and California Code of Civil Procedure §§ 415.46, 715.020, 1161-1174. Landlords can evict a tenant before the expiry of the lease with an unlawful detainer action in civil court.

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59San Francisco Superior Court of California Civil Fee Schedule, [http://www.sfsuperiorcourt.org/sites/default/files/images/SFonly%20Civil%20Fee%20Schedule%20eff%202010114%20rev%202012814_0.pdf](http://www.sfsuperiorcourt.org/sites/default/files/images/SFonly%20Civil%20Fee%20Schedule%20eff%202010114%20rev%202012814_0.pdf)

60Estimate based off Table B2, assuming that there are at least three tenants in the unit and one of them qualified for additional relocation assistance on the basis of being a minor, elderly, or disabled.

61I use here for the discount rate the 10 year Federal Funds rate on March 5, 2013 of 1.9%.

62For a more extensive history of the politics and policy of rent control in California, see Dreier (1997)

63California Code § 1954.50, et seq, 1995

64California Code §1954.42(a)(1)

When the tenant is in breach of the lease, the landlord will issue a 3 day eviction notice. These typically include failure to pay rent, some other violation of the rental agreement, or a nuisance or illegal action on the tenant’s part. If the tenant is in arrears or in breach, the three day notice gives the tenant the option to perform the covenant, but if the tenant is a nuisance or has performed an illegal act, the three day notice to quit is unconditional.

The landlord can also move to evict a tenant on a month-to-month lease without cause by issuing a 30 day notice to quit if the tenancy is for less than one year and 60 days for tenancies of a year or more. Landlords are not required by California law to give cause to a tenant to terminate a month-to-month tenancy, but most choose to. The thirty- or sixty-day notice may be served at any time.

A.2.2 Los Angeles

Los Angeles’ ordinance is substantively very similar to San Francisco’s, including almost identical lists of permitted at-fault and no-fault evictions and landlords must pay relocation costs for no-fault evictions. Buildings whose first certificate of occupancy was issued on or after October 1, 1978 are exempt from controls, as are single-family dwellings and buildings with one unit. The Rent Ordinance currently applies to about 85% of rental housing units. Rent control in Los Angeles is more landlord friendly than in San Francisco. Rent increases are bounded to be between 3%-8% per annum, depending on the inflation rate such that in most years landlords do not suffer an erosion in real rents.

A.2.3 Oakland

Oakland’s regulated annual rent increases are equal to the regional Consumer Price Index rate and are capped at 10% per annum. All buildings with three or fewer units are exempt from rent control or who received their certificate of occupancy on or after January 1, 1983 are exempt from rent regulation, but this exemption does not apply to new buildings constructed on lots whose previous edifice was withdrawn from the market under the Ellis Act. Currently, about 2/3 of the rental housing stock is controlled. As in San Francisco, controlled tenants can only be evicted with a “good cause”. Generally, the grounds for “good cause” evictions in Oakland are the same as in San Francisco, but Oakland’s no-fault provisions are more restrictive. For example, landlords are not permitted to perform an owner move-in eviction at all if the tenant has been in residence for 5 or more years and is in a protected class, such as being elderly, disabled, or catastrophically ill.

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67 Cal. Code of Civil Procedure § 1946.1
68 Los Angeles Municipal Code § 151.09 et seq.
69 Los Angeles Municipal Code § 151.30, 151.22-151.58, and 47.06-47.07
70 Los Angeles Municipal Code § 151.02
71 Source: Office of the Mayor of Los Angeles, [https://www.lamayor.org/mayor_garcetti_announces_new_access_to_information_on_l_a_s_rent_stabilized_buildings](https://www.lamayor.org/mayor_garcetti_announces_new_access_to_information_on_l_a_s_rent_stabilized_buildings), last accessed October 14, 2016.
73 Oakland Municipal Code § 8.22.070
74 Oakland Municipal Code § 8.22.030(D)
75 Oakland Municipal Code § 8.22.030(A)(5)
76 Source: “When Landlords Target Tenants in Rent-Controlled Buildings”, East Bay Express, July 1, 2015.
77 Oakland Municipal Code § 8.22.360
A.2.4 San Jose

San Jose’s rent control law is the most substantively different. About 1/3 of its rental housing units are controlled as of 2016.\(^79\) Rental units built before September 7, 1979 are subject to rent control.\(^80\) Until June 2016, landlords were allowed to increase rents by 8% per annum, but has since been reduced to 5% per annum.\(^81\) Single-family dwellings are exempted and buildings with two or fewer rental units.\(^82\) However, unlike San Francisco, Oakland, and Los Angeles, San Jose landlords can evict without a “just-cause”. San Jose requires landlords to file an eviction notice with the city for any eviction not considered a breach of the lease.\(^83\) Landlords simply need to submit a filing statement affirming the eviction is not being pursued with the intent to “evade the purposes of [rent control]”\(^84\) San Jose also has a specific provision for non-controlled evictions, mandating mediation between tenant and landlord in the case of eviction.\(^85\)

A.3 Other Jurisdictions

Rent control regimes are found in New Jersey, New York, Maryland, and the District of Columbia.\(^86\) The two biggest cities with rent control outside of California are Washington D.C. and New York City.

A.3.1 District of Columbia

Washington D.C.’s rent control has a similar four provision structure as San Francisco.\(^87\)

1. **Rent increases are capped.** The allowable increase is the rate of inflation reported in the Consumer Price Index plus 2% but the total yearly increase may not exceed 10%. Many maintenance costs can be passed through. Hardship provisions exist to ensure that landlords can turn a profit.

2. **Security of Tenancy.** Landlords cannot refuse to renew the lease of a tenant in compliance with the lease.

3. **Vacancy decontrol is limited.** Landlords can charge a rent on a vacant unit of up to 10% more than the previous tenant was paying. If rents in comparable units are higher, landlords may charge that rent instead, but in that case, the rent based on a comparable unit cannot be more than 30% higher than the rent charged to the previous tenant.

4. **No new controlled buildings.** Only buildings built before 1976 and registered as an apartment building or apartment complex are rent controlled.

Currently, about 2/3 of the rental housing units in Washington are rent controlled.\(^88\) In Washington D.C., evictions are also tightly circumscribed, where all tenants have the right to retain their

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\(^79\)San Jose Municipal Code § 17.23

\(^80\)San Jose Municipal Code § 17.23

\(^81\)San Jose Municipal Code § 17.23.800(a), Interim Ordinance.

\(^82\)San Jose Municipal Code § 17.23.150(D)

\(^83\)Specifically, any eviction not covered under a 3 day notice to quit as described in California Code of Civil Procedure § 1161(2)-1161(4)

\(^84\)San Jose Municipal Code § 17.23.600(C)

\(^85\)San Jose Municipal Code § 17.23.7 et seq.

\(^86\)Source: [http://www.landlord.com/rent_control_laws_by_state.htm](http://www.landlord.com/rent_control_laws_by_state.htm)

\(^87\)See [http://dhcd.dc.gov/sites/default/files/dc/sites/dhcd/publication/attachments/RentControlFactSheet.pdf](http://dhcd.dc.gov/sites/default/files/dc/sites/dhcd/publication/attachments/RentControlFactSheet.pdf) for more information

\(^88\)Source: “A Rent Control Report for the District of Columbia”, Peter A. Tatian and Ashley Williams, The Urban Institute, 2011
units unless in arrears on the rent, in breach of the lease, using the unit for illegal purposes, for demolishing the building, conversion to condominiums, housing discontinuance (roughly equivalent to the Ellis Act), or substantial rehabilitation. Owner move-in evictions are also legally permissible in Washington D.C., but landlords must wait 12 months before reoffering the unit for rent. Landlords must pay tenants relocation assistance for owner move-in, substantial rehabilitation, housing discontinuance, and demolition evictions, where an amount ranging between $150-$300 is paid out for each room the tenant has to clear out.

From the findings in this paper, one would therefore expect that [X].

### A.3.2 New York City

Many empirical studies on rent control in the United States have used New York City data. This is in part because New York City is the only large city in the United States with both first-generation hard rent controls and second generation, tenancy rent controls. The tenancy rent controlled buildings have rules similar to San Francisco’s:

1. **Rent increases are capped.** Rent increases are set by the New York City Rent Guidelines Board and set the annual rent increases permitted for 1 year and 2 year leases. For lease renewals commencing October 1, 2016, 1 year leases are permitted a 0% increase and 2 year leases are permitted a 2% increase.

2. **Security of Tenancy.** Tenants cannot be denied a renewal lease if they are fully compliant with the existing contract.

3. **Vacancy decontrol is limited.** Landlords can charge a rent on a vacant unit of up to 20% more than the previous tenant was paying. If rents in comparable units are higher, landlords may charge that rent instead, but in that case, the rent based on a comparable unit cannot be more than 30% higher than the rent charged to the previous tenant. However, landlords can attain full decontrol when the monthly rent grows so high the unit becomes classified as a luxury unit - currently $2,700 and raised annually with the rent increases.

4. **No new controlled buildings.** Only buildings built before 1974 and with six or more rental units in a building are rent regulated.

About 47% of the rental housing units are currently rent controlled, not including about 38,000 units that still have first-generation “hard” rent controls (Sieg and Yoon (2016)). Just as in California cities and Washington D.C., rent controlled tenants can only be evicted with cause. Evictions are regulated by the New York State Division of Housing and Community Renewal, but grounds are established by New York City. Tenants can be given notice and taken to court without approval of the Division if in violation of the lease or delinquent on rent. New York City also allows landlords...

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89 Code of the District of Columbia §42.3505.01
90 Code of the District of Columbia §42-3505.01(d). The 12 month waiting period also applies to housing discontinuance evictions.
91 Code of the District of Columbia §42-3507
92 Code of the District of Columbia §42-3507.03(a)
95 Statutory Authority: N.Y.C Administrative Code, §§ 26-511(b), 26-518(a)
to perform no-fault evictions. With approval from the Division, landlords can move to evict after a tenancy has expired for substantial rehabilitation, demolition or withdrawal from the housing market in the case of landlord hardship. Owner move-in evictions are possible with approval of the Division, by means of refusing to renew the lease for their tenants if they or a relative seek to move in to occupy the unit but the unit cannot be rerented to a new tenant for three years.

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99 N.Y.C. Administrative Code § 26-405(b)
100 N.Y.C. Administrative Code § 26-405(b)(4). Landlords can only proceed to demolish an otherwise sound building if the new building will have 20% more housing units and the city rent agency can require the landlord to pay a relocation stipend.
101 N.Y.C. Administrative Code § 26-405(b)(5)
### Table A1
Policy Changes Regulating Evictions in San Francisco: January 2002-December 2013

<table>
<thead>
<tr>
<th>Description</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Eviction Rules</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Require all eviction notices except those for non-payment of rent to be in writing and filed with the Rent Board. The grounds cited in an eviction notice must be adhered to regardless of any separate agreement between tenant and landlord.</td>
<td></td>
<td>2002</td>
</tr>
<tr>
<td>Landlords who wish to terminate that tenancy are no longer required to give 60 days notice, only 30-days notice, for tenants who have resided in the premises for one year or more.</td>
<td>1/1/2006</td>
<td></td>
</tr>
<tr>
<td>Owners of properties with two or more residential units must disclose to any prospective purchaser the legal grounds for terminating the tenancy of each unit vacant at the close of escrow and whether the unit was occupied by an elderly or disabled tenant at the time the tenancy was terminated.</td>
<td>6/6/2006</td>
<td></td>
</tr>
<tr>
<td>Reinstated the prior requirement of a 60 day notice to terminate a tenancy without a tenant fault good cause for any tenant or resident residing in the unit for a year or more. Sunsetted after 3 years.</td>
<td>1/1/2007</td>
<td>12/31/2009</td>
</tr>
<tr>
<td>A tenant who has resided in the unit for at least one year, and has a child under the age of 18 who also resides in the unit, may not be evicted during the school year for an OMI eviction.</td>
<td>3/14/2010</td>
<td></td>
</tr>
<tr>
<td>Tenant may not be evicted for violation of a unilaterally imposed change in the terms of a tenancy unless the tenant accepted the newly imposed term in writing or the newly imposed term is authorized by the Rent Ordinance.</td>
<td>12/14/2011</td>
<td>2/1/2012</td>
</tr>
<tr>
<td>Allows a landlord to evict a tenant for violation of a unilaterally imposed change in the terms of a tenancy where the change is required by law</td>
<td>2/1/2012</td>
<td></td>
</tr>
<tr>
<td>Condo conversion evictions are suspended</td>
<td>8/1/2012</td>
<td></td>
</tr>
<tr>
<td><strong>Ellis Act</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landlords must state in Ellis Act eviction notices that tenants have the right to relocation payments and the amount which the landlord believes to be due.</td>
<td>7/25/2005</td>
<td>1/30/2006</td>
</tr>
<tr>
<td>Landlords are no longer required to state the amount of relocation payment the landlord believes to be due to the tenant</td>
<td>1/31/2006</td>
<td></td>
</tr>
<tr>
<td><strong>Owner Move-In</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landlords seeking to challenge a tenants’ protected status for an OMI eviction have to file a Rent Board petition rather than seeking a declaratory relief action in court</td>
<td>2006</td>
<td></td>
</tr>
</tbody>
</table>

Source: The Rent Board of the City and County of San Francisco.
## TABLE A2
Relocation Payments for Ellis Act and Other No-Fault Evictions: February 2000-February 2014

<table>
<thead>
<tr>
<th>Start Date</th>
<th>End Date</th>
<th>Low Income Tenant</th>
<th>General Tenant</th>
<th>Max Payment</th>
<th>Protected Surcharge</th>
<th>General Tenant</th>
<th>Max Payment</th>
<th>Protected Surcharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/13/2000</td>
<td>8/9/2004</td>
<td>4,500</td>
<td>0</td>
<td>0</td>
<td>3,000</td>
<td>1,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8/10/2004</td>
<td>4/24/2005</td>
<td>4,500</td>
<td>4,500</td>
<td>13,500</td>
<td>3,000</td>
<td>1,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4/25/2005</td>
<td>5/25/2005</td>
<td>4,500</td>
<td>0</td>
<td>0</td>
<td>3,000</td>
<td>1,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5/26/2005</td>
<td>2/28/2006</td>
<td>4,503</td>
<td>4,503</td>
<td>13,510</td>
<td>3,047</td>
<td>1,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3/1/2006</td>
<td>8/9/2006</td>
<td>4,503</td>
<td>4,503</td>
<td>13,510</td>
<td>3,047</td>
<td>1,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8/10/2006</td>
<td>2/28/2007</td>
<td>4,503</td>
<td>4,503</td>
<td>13,510</td>
<td>3,047</td>
<td>4,500</td>
<td>13,500</td>
<td>3,000</td>
</tr>
</tbody>
</table>

Table [B.2] shows the mandated relocation payments given to tenants for Ellis Act evictions and all other no-fault evictions. “Low Income Tenants” are the payments originally only given to poor tenants before August 2004 for Ellis Act evictions before being extended to all tenants. “General Tenants” are the relocation payments that were given to any controlled tenant. All amounts are in nominal US dollars.

a From March 2006 onwards, payments were adjusted each March (at the discretion of the Rent Board) using the Consumer Price Index calculated for the San Francisco-Oakland-San Jose Combined Statistical Area.

b “Other No-Fault” includes Owner move-in, demolitions, temporary capital improvement work, or substantial rehabilitation.

c “Protected Surcharge” refers to the extra relocation payment the landlord pays if one of the evicted tenants is a minor, an elderly adult aged 60+, or who is disabled within the meaning of §12955.3 of the California Government Code.

d Relocation payments made to all tenants was challenged in court in Pieri v. San Francisco, 137 Cal. App. 4th 886 (2006). The payments were briefly struck down between April 25-May25 2005, but upon appealing the decision, the judge granted the city a stay of the ruling and the relocation payments have been in force ever since.

Source: The Rent Board of the City and County of San Francisco.
Data Appendix

B Commuter Shuttle Stop Data Appendix

This Appendix has a list of citations for the sources used for shuttle stops and routes, and lists any assumptions made on routes. Information on shuttle routes comes chiefly from Google, Stamen Design, and the publicly available sources detailed below.

There are some gaps in the publicly-available information on where the shuttle stops are, so some assumptions were made about timing and placement. These are detailed in Section B.4.

B.1 Websites


Map of Google Shuttle Stops as of October 2011 Maintained by Anonymous Google Maps User, https://www.google.com/maps/d/viewer?mid=zM2GuPjAzei0.kZZnxCxSIWAg&hl=en_US.


Map of Yahoo! Shuttle Stops as of August 2009 Maintained by Google Maps User Chris, https://www.google.com/maps/d/viewer?dg=feature&msa=0&mid=z1TFSs454VJc.kQ1Hu1QzKDg.

A list of Electronic Art’s Stops as of January 17, 2012 is available at http://www.etc.cmu.edu/siliconvalley/blog/faq/.

A list of Shuttle Stops Entered Into Foursquare Curated by User Zach as of July 2012 is available at http://dotspotting.org/u/939/sheets/2227/#c=11.00/37.7550/-122.4328.

\[103\] Interview with Brendon Harrington conducted on May 30, 2014

\[104\] http://content.stamen.com/zero1
B.2 News Stories and Publications


Farivar, Cyrus. Apple Launches Employee Shuttle This Week. *MacUser* (October 25, 2007).


B.3 Miscellaneous Sources

Thanks to David Dai and Danielle Weinzimmer, who privately provided me their maps of the shuttle routes. I would also like to thank an anonymous employee of a company under study who provided me with their shuttle stops. Lastly, I would like to thank Brendon Harrington of Google, who allowed me to interview him about Google’s bus operations.

B.4 Assumptions

- Apple shuttle service started in October 2007. Assume that stops observed in Winter 2009 were in place by then, as there is no evidence that stops ever changed.

- Google shuttle service started in September 2004, and expanded throughout 2005 and 2006 with very little documentation. Helft (2007) discusses riders moving to the Pacific Heights stops, which refers presumably the Van Ness corridor, in 2005. Anders (2007) mentions that the stops in Noe Valley had been in place since “early 2006”. Google maps from Fall 2006 confirm that there were Noe Valley stops, in addition to a stop at a park and ride center near Lake Merced in the extreme southwest of the city. These maps also indicate that there were no stops directly in the Van Ness Corridor, but spread elsewhere throughout Pacific Heights, in accordance with Helft. Earliest extant full map is from January 2009, and has the Van Ness Corridor, 19th Avenue Corridor, Noe Valley/Bernal Heights/Castro Districts and Haight-Ashbury stops in place.

  - Assume that the Lake Merced Stop was replaced by the 19th Avenue Stops and the Cow Hollow/Pacific Heights stops were replace by the Van Ness Corridor Stops in May 2008.

  - Assume that Noe Valley, Bernal Heights, Haight-Ashbury, and Castro Valley stops were in place since February 2006.

C Public Bus Stop Data Appendix

A panel of all public bus, train, and light rail stops was assembled to complement the dataset on the commuter shuttles. While this was a straightforward exercise for the Caltrain, the BART, and the MUNI light rail, SFMTA records on public bus stop information are only available in four waves of information. The agency directly provided a series of PDFs on all the SFMTA bus routes as of February 2008 and then a supplementary dataset of stop characteristics as of 2015. From the 2008 PDFs, a list of stops was assembled and some basic information such as stop length was collected. Data prior to 2008 was not forthcoming, but representatives of the agency claim that public bus stops were virtually unchanged between 2003 and 2008.

From data.sfgov.org, the main repository for any publicly available information published by the City and County of San Francisco, a March 2012 list of stops with their characteristics was made available. This was merged on to the 2008 routes data to fill in more information about each stop. While it necessarily misses any changes in stop characteristics between February 2008 and March 2012, it is likely that most stops changed very little over time.

Starting from February 2009 onwards, the SFMTA makes publicly available a refreshed list of their public bus stops on a semi-regular basis (updated usually every 2-3 months). In total, there were 43 waves of public bus stop names released by the SFMTA between February 2009 and December 2013. However, the stop naming system used between 2008 and 2009 changed, so that it was impossible to link the two datasets directly. Namely, the 2008 data uses special stop name abbreviations that are used also in the 2012 and 2015 stop characteristics spreadsheet, but the 2009 and onward spreadsheets report only the full address. A merge of the 2008 names onto the 2009-2013 datasets on the basis via the March 2012 spreadsheet, which has both fields, left about 14% of the dataset unmatched on average. A careful review of the names of the unmatched street addresses left only 31 stops (or about 0.7%) of 2009-2013 stops not assigned one of the SFMTA’s abbreviations. When narrowed down only to stops that were eligible to host a commuter shuttle, only 7 out of 880 were dropped from an inability to consistently identify them.

The result is a panel of 880 eligible bus stops. The vast majority are concentrated around the central business district, but also throughout the city clustered around significant arteries. Figure 4 displays the locations of the eligible public bus stops, Caltrain, BART, and SFMTA light rail stops as of September 2004. The most significant change that occurs over the study’s time period is the opening of the SFMTA’s T Line on 3rd Street on the far east side of the city in January 2007.

105 It is very hard to get a sense of how much change there is. A comparison of the March 2012 stops characteristics spreadsheet with the Fall 2015 spreadsheet is impractical because few fields in common are consistently filled in. However, stop length is reported in both, and the number of changes in length was less than 2%.

106 The data are available at a repository at this web address: http://www.gtfs-data-exchange.com/agency/san-francisco-municipal-transportation-agency/

107 e.g., “Powell St and Market St” has the special abbreviation of “POWLMRKT” or “MRKTPOWL”, depending which street the actual stop is on. The full address and the abbreviation can be linked with some difficulty.