Rents and Welfare in the Second Industrial Revolution: Evidence from New York City
Rowena Gray

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Abstract:
This paper presents new archival evidence on housing rents in New York City for the period 1880-1910 from newspaper advertisements. The rental information was geocoded and linked to information on local amenities and disamenities using historical maps of Manhattan Island and the software program GIS. This allowed additional linkage with ward and district-level census and health study data. With this comprehensive dataset, a quality-adjusted index of rents is developed and the capitalized value of each feature estimated, adjusting for spatial correlation at the sub-city level. The resulting index shows an overall increase in quality-adjusted nominal rents in the city of 39%, with a ramp up in average rents during the 1880s, to a peak in the early 1890s and further increase and increased volatility in the 1900s. More data is being added to the current sample to build a clearer picture of the evolution of rents over this period, a key component of estimates of standard of living which are typically ignored or ill-measured.

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2 I acknowledge the support of an EHA Cole Grant which facilitated the collection of rental data, and a UC Merced Committee on Research Grant which facilitated geocoding of the data. Excellent research assistance provided by Frank Chou, Cecilia Garcia, Sewon Kim, Jason Lee, Charles Martin, Jacob Miller, Jose Ulloa and Richard Wright. I also thank participants at the 2013 EHS, EHES and Swedish Economic History Meetings and the 2015 WEAI Conference for useful discussions and suggestions. I acknowledge Carlos Villarreal who built the historical GIS maps of Manhattan Island and geocoded the first round of observations.
Introduction

This paper presents a new dataset of rental prices for New York City housing for the period 1880-1910. This address-level rental information is geocoded on a historical map of Manhattan Island and thus linked to a very detailed set of locational characteristics. The paper then uses hedonic regression techniques, a standard in the housing literature, to generate a quality-adjusted rental index for those years and to investigate the value of each apartment characteristic and locational amenity/disamenity in the rental market. The aim is to devise new estimates of the urban housing cost around the turn of the twentieth century and to inform measures of the urban standard of living more generally at that time.

Haines (1989, p. 8) describes housing costs as “one of the more difficult components of cost of living to obtain”. He used the Aldrich Report of 1890 to construct measures of housing costs in U.S. cities and to then compile cost of living indices for that year. It was possible to include housing in only 5 out of 68 cities. For Drelichman and Gonzalez Aguda (2012, p. 38), housing costs are “the neglected child of price history”. Existing estimates of costs of living have focused on prices of consumption goods and have typically assumed a quite low fraction of income was spent on housing (5-10% in Allen (2001)) and indeed this seems too low for a study of large urban areas. Often housing estimates that are used to compile overall CPI measures are based on very few observations that are not quality-adjusted. This paper is part of a growing literature that seeks to improve our knowledge of housing costs and conditions across a wide range of countries and time periods, some of which is discussed below. Measuring this key component in the consumer price index more accurately also facilitates a much better understanding of the real value of any given nominal wage during our sample period.

Changes in rental values should have had large welfare implications on the New York population since rental units have comprised the majority of the Manhattan housing market since the nineteenth century. Only 9.63% of household heads

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2 Drelichman and Gonzalez Aguda (2012) found that it was only half the true value for pre-industrial Toledo.
reported real estate holdings in 1870\(^3\), which decreased to 1.7\% owner-occupied dwellings by 1940\(^4\). Rents were a large part of household budgets—in 1901, estimates of the share spent on rent range from 16.7\% to 22.3\%\(^5\).

**Literature Review**

A number of recent publications explore historical real estate markets. Nicholas and Scherbina (2013) construct a quality-adjusted index of real estate sales for Manhattan, before and during the Great Depression, based on transaction-level data collected from archival sources, and show that high-end Manhattan real estate prices followed the stock market closely but ultimately property proved a less lucrative investment over this period. Similarly, Raff et al (2013) present a new, quality-adjusted, house price index for historical Beijing over the long run, 1644-1840.

These papers explored the sales market, which is historically less important in terms of the budget of the average person in large U.S. cities than the rental market. The literature on rental markets in history is more sparse. For England and Wales, Clark (2002) collected data on 11,188 rental contracts over the very long run (1640-1909) from the records of charity groups. He used the observations on which there were multiple transactions to compute a quality-adjusted rental index and used this to construct estimates of trends in housing quality, showing that quality increased little during the Industrial Revolution even while rents increased. His findings add to the conclusion of the literature on this period that living standards could not have increased substantially even as technological change proceeded rapidly.

Margo (1996) constructed a quality-adjusted index of rents for New York City and its surroundings for the period 1830-1860, using newspaper advertisements for this period. His sample contained fewer than 1,000 observations and so

\(^3\) 1\% Sample of the Population Census by IPUMS.
\(^4\) 1940 Housing Census.
could not be used to construct neighborhood-level indices, but was comprehensive enough to estimate the capitalized value of various unit-level characteristics as well as the distance to City Hall. The coefficients on the year dummies were used to construct a rental price index, which showed that the urban cost of living increased more over this period than had been shown in previous work which used less comprehensive rental information. Rees (1961) had also used newspaper advertisements as a source of housing rental information—he chose the New York World because of its working class target audience, and this paper makes use of this publication as well, as outlined below.

Eichholtz et al (2012) use annual data for Amsterdam for the years 1550-1850 to construct a constant-quality rental index using the repeated measures approach. They focus on periods where rents change to try to identify market rents, although they acknowledge that this approach may overstate the true market volatility. The paper further examines the correlation between rents and business cycle forces, finding a strong correlation for this period.

Drelichman and Gonzalez Aguda (2012) constructed a new dataset of rents for Toledo, Spain, over the years 1489-1600 based on the records of the Cathedral Chapter of the city. They were able to measure costs separately by social status and analyze the evolution of rents compared to population and economic growth trends as well as the timing of plagues and subsistence crises. As we do in our paper, they have to proxy the size of units rented in their sample due to a lack of full data on that aspect of the transaction-- they use building footprints combined with census information to complete this task.

A recent study by Kholodilin (2015) presents monthly data on asking rents in Berlin gathered from newspaper advertisements, from 1909 to 1917, and explores the determinants of trends in the time series during and after World War I and the consequent population and building fluctuations. It is, to our knowledge, the only other study that has geocoded rental information from historical newspapers and computed a hedonic rent index controlling for detailed locational as well as unit characteristics.
Historical Housing Market in New York City

The beginning of the sample period, 1880, signaled the development of the market for apartments for middle class and wealthy people in New York City, where previously such families would only reside in houses. Another trend in the 1880s was the use of cooperative building owning arrangements. Furthermore, the city moved northwards as transportation improved and new areas of the city (like the Upper West Side) became increasingly acceptable and fashionable over the sample period. Over time, competition became tougher for tenants and luxury apartment buildings became more common.

In general, housing was fairly unregulated during this period, with no zoning in New York City until 1916 and no rent control. Building standards were the main form of regulation. The Second Tenement House Act had just been passed in 1879, calling for ventilation to every room, improved toilets and limiting the proportion of a lot that a tenement could cover to 65%. Between this year and 1901 when the next tenement law was passed, most new buildings in tenement areas were dumbbell tenements. In the 1890s some slums were cleared to reduce the spread of tuberculosis, but new housing was not built in its place; the 1895 act dealt with provision of public parks and school playgrounds; the more far-reaching 1901 Tenement Law improved standards for ventilation, lighting, fire-proofing, overcrowding and sanitary and cellar facilities; after WWI a Bureau of Standards was established, testing materials to reduce the fire risk in homes. The 1901 act led to new types of tenements being built (so-called new law tenements which had minimum requirements for room size, light and ventilation). Buildings now officially had to have inner courtyards and were limited to a maximum of six stories (DeForest and Veiller, 1903, xvi). Of course, these laws were enforced with varying intensity depending on the political pressures of each period. For example, often fines were sufficiently low that builders would pay them rather than build quality housing. Buildings for

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6 One source suggests that in 1869 there was 1 rental building, as we would understand it today, in New York City, but 300 by 1885 (Nevius and Nevius (2009), p. 150).
middle-class dwellers could circumvent the height and setback regulations imposed on tenements during this decade (Plunz (1990), p. 85). It was not until 1926 that a Housing Act was passed to incentivize companies to build reasonably priced housing and in 1928 the City Housing Corporation was established and began building public housing.\(^8\)

One negative consequence of the wave of housing reform was that less low cost housing was constructed. Figures from Anthony Jackson suggest that the ratio of new tenements to new flats constructed in 1879-1884 was 5:2, but that for the years 1884-1889 this ratio fell to 2:7.\(^9\) With record levels of immigration in the 1900s, tenements were once again constructed in large numbers—in 1905, more than a third of all new builds were tenements.\(^10\) Prices were also bid up by New York City's continued ascent as a major commercial center. These new law tenements were typically beyond the price range of many new immigrants who sought to live in these areas, close to their work: this led to a vacancy rate in 1909 of 7.5%, despite huge demand for housing, as owners refused to lower rents or to rent to these new immigrants.\(^11\) The rent strike of 1907 was an attempt by tenants to fight back against landlords’ attempts to control the housing market and keep supply limited so as to push up rents.\(^12\)

There was much change in the composition of neighborhoods over the sample period. From 1880, a building boom was in full swing in the suburbs of U.S. cities—the borough of Queens grew extensively in this period, for example.\(^13\) Middle-class and perhaps mainly native-born Americans chose to move out to these areas. Certainly the secondary sources suggest that unskilled new immigrants crowded into the downtown tenements, even “slowly crowding out

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\(^9\) Jackson (1976), p. 78.
\(^12\) The strike lasted from 12/26/1907 until 1/9/1908. About 2000 families had their rents reduced as a result.
the old German and Anglo-Saxon inhabitants.”\textsuperscript{14} The Industrial Commission on Immigration (pp. 465, 469) also concurred with this analysis, that older immigrant groups became more spatially dispersed over time—whether this is indeed due to prejudice and a dislike to be located closely to newer immigrant groups such as the Italians and Russian Jews, or just to a natural process whereby networks are more important initially than over time, is not clear. These were the groups who could afford to use the commuter transportation which was emerging and making suburban life possible. Home ownership grew a lot by 1920, but in New York City still comprised only 12% of the population.\textsuperscript{15} Immigrants may have settled initially in the 4\textsuperscript{th} and 6\textsuperscript{th} wards because of their proximity to the port of entry—a temporary place before they moved on.\textsuperscript{16} Scherzer (1992, p. 41) provides clearer evidence of this by examining transfer requests across Protestant parishes in the 1860s. He finds that natives were moving uptown or out of Manhattan as immigrants moved in, but most did not move far—New Jersey was the most common destination.\textsuperscript{17} Streetcars electrified in the mid-1890s, and areas such as Brooklyn developed rapidly following that transportation innovation.

Harlem grew and became a black neighborhood from the 1890s because of the depression and because the Tenderloin, a traditionally black area, had displaced blacks due to the building of the railroad depot, and because many buildings were newly built in the early 1890s when it was thought that Harlem would expand quickly. Blacks became further concentrated in Harlem after the housing market there collapsed in 1904-5, as apartments were built too far in advance of demand anticipated with the new subway. Housing markets responded in other ways to general economic movements. For example, the panic of 1907 resulted in an increased incentive to convert individual dwellings to apartments and boardinghouses, as happened in Greenwich Village.\textsuperscript{18}

\textsuperscript{15} Wright (1981), p. 195.
\textsuperscript{16} Scherzer (1992), p. 31.
\textsuperscript{17} Scherzer (1992), p. 41.
\textsuperscript{18} Nevius and Nevius (2009), p. 220.
Data and Methodology

This section describes the data sources that are used in this project and formally presents the methodology.

Firstly, information on rents at the unit-level was collected from newspaper advertisements. Secondly, historical maps have been coded into GIS and we can thus place our rental observations on these maps. The main challenge in completing the geocoding task was where public housing projects (or private developments such as at Stuyvesant Town) or other major new buildings (Penn Station, for example) have been constructed since 1910 which may have changed the street map substantially. The data was manually checked several times to ensure that units are located correctly and some regressions restrict to observations that could be coded with full confidence.

Using this dataset, proximity of each unit to a variety of amenities such as Central Park, the CBD, fire stations, public transportation, schools and hospitals can be calculated. It further allows us to link the rental information to other datasets such as the federal censuses and health department reports which then provide more information about the localities in which our units are found.

Rents

We follow Margo (1996) and others in securing rental information from newspaper advertisements. Economic historians have elsewhere used newspaper advertisements to obtain information regarding labor markets (Schulz et al 2013 and Alvarez and Hofstetter 2012). Raff and Trajtenberg (1997) used trade journals as a source for prices and attributes of automobiles for the period 1906-1940. Kholodilin (2012) uses advertised prices from Internet sources to construct apartment price indices for 48 European cities. The New York Sun, New York Times, New York World (from 1885 on) and the Brooklyn Daily Eagle (used in only a few cases) newspapers were utilized for this purpose. Advertisements were coded where information was available on (at a minimum) the asking rental value and the exact street address of the unit. Various additional information was included in the typical advert, such as
whether or not the unit was furnished; some measure of unit size such as the
number of rooms or number of stories; whether the unit was located close to
public transport; and whether an array of amenities such as electricity, steam
heating or fixtures and fittings were included. The current sample comprises
7,955 observations covering 1880-1910 (with some gaps which are being filled),
which have been geocoded to historical maps of Manhattan Island.19 The dataset
is a work in progress.

23% of observations listed a range for the rental price. Many observations do
not specify what the rental period is, but of those that do, monthly is the most
commonly listed, followed by weekly. 75% of the listings that show an annual
price are houses rather than apartments, compared to just 15% of housing
advertisements showing monthly rents.

Similar to Margo (1996), I cannot verify that the rental advertisements are a
truthful description of each unit (although it is possible to check that the outside
amenities they describe were actually there—subway, elevated train and so on).
I also acknowledge that these are advertised prices for rentals rather than actual
agreed final rents paid. The sampling technique was to collect most of the data
from the months of March and April because May 1st was the main moving day20
and rents were usually set around January-February, when the existing tenants
could decide to stay or move, with most moves taking place on May 1st.21 There
is some evidence that October 1st was another common moving day, so, for years
where newspaper records were not available for March-April, September is used
instead. If neither month was available, whatever data could be found for that
year was used, to avoid gaps in our time series. For the analysis below, the
sample was limited to March-May and August-October observations. We
recorded cases where units were re-advertised with new rental values, but may

19 Rental observations were collected for some Bronx and Brooklyn cases, but
have not been used in the analysis below.
20 Eichholtz et al (2012, p. 273) describe how May 1st was also the main moving
day in Amsterdam from 1400 until into the twentieth century.
not capture all of this information given the sampling strategy’s focus on March-May of each year.

A further data issue is that, in tenements particularly, two families might occupy an apartment, one subletting from the other. Such arrangements were not advertised in newspapers. However, in other work I am collecting the census information on who was living in each of our sample buildings in the census years 1880, 1900 and 1910, which should provide some idea about the prevalence of subletting.

A variety of different types of apartments and homes are advertised for rent in the various newspapers. The New York Times does appear to target a wealthier clientele, with a higher proportion of units being located next to Central Park and the more prominent avenues running North-South from the Park to downtown. Large townhouses are advertised alongside smaller apartments or parts of houses to rent. Some advertisements offer commercial premises, or often commercial space with residential rooms attached (201 observations in total, which are omitted from the analysis below). However, the New York World has been argued to target lower class individuals and all publications carried “rooms for let” or “boarders wanted” type of adverts, targeting those who simply need 1 room, furnished or unfurnished, in a large house. In the data collection process, we tried to cover as many different types of advertisements as possible. Examples of the advertisements can be found in the appendix.

Figure 1 maps 8,028 rental observations on the island of Manhattan, pooling data across years and showing that there is coverage across the entire island. Coverage is less complete at the extremities—the downtown area had already become very commercial and the Northern part of the island was not yet as populated (the sample is currently less complete for the later years of the sample period which may account for this). The main area that needs a greater quantity of observations is the Lower East Side, which was a significant population and immigrant center during these years. The distribution across neighborhoods is
shown in Figure 3. I have defined 14 neighborhoods based on a boundary map for New York City showing “Neighborhood Tabulation Areas” created from the 2000 and 2010 censuses. The boundaries used are based on historical neighborhoods and I have aggregated some due to sample size constraints.

Figure 2 shows the distribution of observations by year and newspaper source. Data collection and cleaning is not yet complete, but shows that few years are completely missing. The final sample will contain observations from newspapers with different target audiences for each year. The New York Times clearly had a higher class clientele than the New York Sun and New York World as the units advertised tend to be more expensive (more likely to be houses also) and they tend to be located in fashionable areas close to Central Park and the main avenues.

_Checks on the Data_

Since this paper only uses asking rents, as a robustness check I investigated other sources that listed actual rents paid during the sample period for comparison.

_The Charities Review_, Vol. X, 1900, p. 3, provides some rental data and description of apartments where textile manufacturing is taking place (these are typically in or near the Lower East Side and may be tenement buildings). On East 12th Street they list an apartment of 4 rooms, inhabited by 2 Austrian families for a total of 7 people, renting for $14. On Elizabeth Street 2 Italian families rent 3 rooms for $6, while another 2 Italian families rent 3 rooms for twice that price. In my sample are furnished rooms listed in 1895 on East 12th Street for between $2.50 and $6 per week.

The _Evening World_ newspaper, on September 23, 1908, listed some non-location specific rental and budget information in their editorial section. One letter to the editor mentions that the writer was then paying $30 per month for a 4-room heated flat, while another letter mentions a yearly rent of $312 and another says $288 per year. The dataset based on newspaper advertisements lists 4-room
apartments in 1908 for $19-40 per month in various locations within the city (currently those are only from the New York Times source). These nominal asking rents seem to match up broadly with the actual nominal rents in the Evening World source.

Dora Costa’s dataset on women giving birth in the Lying In Hospital in New York City lists actual monthly rents paid by those households.22 I looked at 28 observations from 1910 and compared them to my sample of asking rents. A number of observations were close enough geographically for direct comparison. For example, 1 unit from my sample was 733ft from 1 of Costa’s observations on West 81st Street—nominal monthly rent from my sample was $12 and $8 for the Costa observation. Another observation was 976ft away on East 11th Street and again the rent listed in my dataset was $12 and in Costa’s $8. These rents are currently being geocoded to facilitate a more comprehensive comparison with the geocoded asking rents dataset.

Local Amenities

Villarreal’s dissertation developed a new spatial framework for the analysis of historical urban conditions in a GIS environment. These new data provide a foundation to accurately reconstruct address-level spatial features from this period using records including, but not limited to, fire insurance maps, tax assessment records, real estate sales records, special reports of epidemics, and transportation and sanitation infrastructure maps. The resulting reconstruction yields an array of spatial amenities similar in breadth and accuracy to those employed in the analysis of contemporary housing markets. Figure 4 maps many of the spatial features that are used in this paper.

22 The dataset was downloaded from Dora L. Costa’s website on 8/6/2015: http://www.econ.ucla.edu/costa/data.html.
Methodology

A hedonic regression approach is used to construct a constant-quality rental index.\textsuperscript{23} The rents were converted to monthly values and the following hedonic regression was run on the pooled sample, using Conley’s standard error correction for spatial correlation across districts in all cases:

\[
\ln r_{it} = \beta X_{it} + \tau A_{it} + \delta_t D_t + \rho P + \gamma S + \varphi M + \eta N + \varepsilon_{it}
\]

where D is a vector of year dummies; P is a vector of period dummies (depicting whether rents were listed as daily, weekly, monthly or yearly); S is a vector of newspaper source dummies; M is a vector of month of advertisement dummies and N is a vector of neighborhood dummies. X is a vector of unit characteristics including board; heating; electricity; number of rooms; number of bathrooms. A is a vector of amenity characteristics, including distance to Central Park, distance to a marsh, although only some of these vary over time (such as the number of public transport access points located within a .5 mile radius).

The dummy for 1910 was omitted and the deltas for each year could then be used to construct a quality-adjusted rental index, where 1910=100, according to the following formula:

\[
100 \times \exp(\delta_t)
\]

Apartment Size:

One major issue to be dealt with was how to measure apartment size, which often was not precisely described in the rental adverts but which has consistently been shown in previous studies to be a key determinant in rental values. A number of approaches have been adopted to deal with this issue. The first, presented below, is to restrict the sample to observations that contain the number of rooms or stories being rented.

\textsuperscript{23} Diewert (2006) concluded that the hedonic regression approach is the best for constructing constant-quality rental price indexes.
As an alternative, data was obtained which shows the building footprint for every building currently present on the island of Manhattan. This was restricted to buildings built in or before 1910 and calculated the residential square footage of that building, estimating average square footage per apartment. This dataset was then used to build a surface map of square feet per apartment across the entire island. The main issues in doing this are that building use may have changed since 1910 and that there has been considerable consolidation of units over the last century, especially in certain parts of the city. Uptown is the main area identified as changing sufficiently so that the size estimates are based on relatively few observations of 1910 residential units, spread far apart. Currently we are exploring ways of improving this measure\textsuperscript{24} and can also complete the robustness check of using only observations with size information among our rental sample.

**Summary statistics**

The dataset was limited to observations on the island of Manhattan that were residential use only, and were recorded in the sample months of March-May and August-October. This sample contains 5996 observations. A further restriction used in certain specifications was that some information on apartment size be included in the advertisement. This more limited sample contains 5130 observations. It includes observations which did not explicitly list the number of rooms but gave the number of stories for rent, which could be used to approximate number of rooms. A further data issue was that a rental price was often listed without specifying whether the price was a daily, weekly, monthly or yearly value. In only 1127 out of 5996 cases was the period explicitly listed—this information was used to assign a period to the other observations.

\textsuperscript{24}Information is being collected from the website zillow.com regarding number of units and stories for our buildings and any information on the configuration of the units. Similar information is being gathered from building permits which often list the configuration of buildings, even if an application was made solely for a minor improvement to the building (these records are from the post-1916 zoning period but some permits are from very close to our sample period, before substantial consolidation of buildings took place). The website streeteasy.com is also being consulted for measures of apartment size.
Table 1 shows summary statistics for both the sample containing 5996 observations and the limited 5130 sample. The sample means are quite similar. This table shows the breakdown of the samples by type of listing, i.e. whether it’s a house or apartment or just advertised “rooms to let” and whether board is included or the unit comes furnished. The average rent for the sample used in the analysis below is $39.46 per month and the average size is 4.5 rooms.

Current Hedonic Regression Results:
The current (very preliminary) results are presented in Table 2. They suggest that apartment size is a significant determinant of log rents—a 1% increase in the number of rooms leads to a .84% increase in rents. So, if the mean size unit (of 4.5 rooms) were to increase by 10% (to roughly 5 rooms) then the rent would increase by 8.4%. Adding rooms is more important in apartments compared to houses, as shown in columns 3 and 4 of Table 2. Units that include board ask for rents that are 46% higher while furnished units rent for a 13% discount. Landlords were apparently willing to rent to men at a 7% discount compared to ladies or couples while modern conveniences such as elevators and being located in a fireproof building require rent premia, as expected.

The time dummies are then used to construct a quality-adjusted rental index, which is depicted in Figure 5. It shows that rents increased significantly during the 1880s before collapsing in the 1890s, in line with the general economic depression of that decade. Overall, from 1880 to 1910 the quality-adjusted rental index increased 39%. As more data is added, we can develop a clearer picture of trends in real rents, analyzing the determinants of the time series which might include population movements including those due to immigration; housing booms and busts and retail price movements.
References


Schulz, Wiebke, Ineke Maas and Marco H.D. van Leeuwen (2013) “Employer’s Choice-- Selection through Job Advertisements in the Nineteenth and Twentieth Centuries”.


Figures and Tables

Figure 1: Rental Observations on Manhattan

Notes: This map shows the 8028 observations in the full sample, including some in the Bronx and Brooklyn which are not used in the statistical analysis.

Figure 2: Rental Observations by Source Newspaper and Year

Notes: This graph uses information from the 5996 observations used in the hedonic regression analysis.
Figure 3: Distribution of Rentals by Neighborhood

Notes: These are modern definitions of neighborhoods and some have been combined to reduce the number of categories to 14 (e.g. Central Harlem North and South were combined).

Figure 4: Spatial Features
Figure 5: Quality-Adjusted Rental Price Index for New York City, 1880-1910

Notes: 1910 is 100. The index is derived using the year dummies from the standard regression for the sample of 5130 observations containing apartment size information described above, following the formula given above. This is the nominal index.
Table 1a: Descriptive Statistics

Full Usable Sample (5996 observations)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>Obs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>1893</td>
<td>8.1</td>
<td>1880</td>
<td>1910</td>
<td>5996</td>
</tr>
<tr>
<td>Rent ($ per month)</td>
<td>45.89</td>
<td>40.75</td>
<td>4.33</td>
<td>400</td>
<td>5996</td>
</tr>
<tr>
<td>Distance to Downtown (miles)</td>
<td>4.64</td>
<td>2.17</td>
<td>.13</td>
<td>10.93</td>
<td>5996</td>
</tr>
<tr>
<td>Distance to Nearest Core (miles)</td>
<td>2.02</td>
<td>1.38</td>
<td>.07</td>
<td>7.36</td>
<td>5996</td>
</tr>
<tr>
<td>Number Subway or Elevated Stations Nearby</td>
<td>11.55</td>
<td>7.4</td>
<td>0</td>
<td>45</td>
<td>5996</td>
</tr>
<tr>
<td>Board</td>
<td>8.5%</td>
<td></td>
<td></td>
<td></td>
<td>508</td>
</tr>
<tr>
<td>Apartment</td>
<td>51%</td>
<td></td>
<td></td>
<td></td>
<td>3055</td>
</tr>
<tr>
<td>House</td>
<td>14.2%</td>
<td></td>
<td></td>
<td></td>
<td>849</td>
</tr>
<tr>
<td>Rooms to Let</td>
<td>27.4%</td>
<td></td>
<td></td>
<td></td>
<td>1643</td>
</tr>
<tr>
<td>Furnished</td>
<td>23.4%</td>
<td></td>
<td></td>
<td></td>
<td>1402</td>
</tr>
<tr>
<td>“All improvements”</td>
<td>24.6%</td>
<td></td>
<td></td>
<td></td>
<td>1477</td>
</tr>
</tbody>
</table>

Notes: Distance to Downtown was calculated using the latitude and longitude for the corner of Wall Street and Broadway. The nearest core is either Downtown, or Grand Central Station. Nearby is defined as within a .5 mile radius. Subway or Elevated Station points means access points to enter either form of transport.
Table 1b: Descriptive Statistics

Sample including Size Information (5130 observations)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
<th>Obs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
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<td>8.1</td>
<td>1880</td>
<td>1910</td>
<td>5130</td>
</tr>
<tr>
<td>Rent ($ per month)</td>
<td>39.46</td>
<td>30.70</td>
<td>4.33</td>
<td>400</td>
<td>5130</td>
</tr>
<tr>
<td>Distance to Downtown (miles)</td>
<td>4.62</td>
<td>2.19</td>
<td>.13</td>
<td>10.93</td>
<td>5130</td>
</tr>
<tr>
<td>Distance to Nearest Core (miles)</td>
<td>2.04</td>
<td>1.37</td>
<td>.07</td>
<td>7.36</td>
<td>5130</td>
</tr>
<tr>
<td>Number Subway or Elevated Stations Nearby</td>
<td>11.43</td>
<td>7.24</td>
<td>0</td>
<td>45</td>
<td>5130</td>
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<tr>
<td>Board</td>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td>508</td>
</tr>
<tr>
<td>Apartment</td>
<td>52%</td>
<td></td>
<td></td>
<td></td>
<td>2670</td>
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<tr>
<td>House</td>
<td>8.6%</td>
<td></td>
<td></td>
<td></td>
<td>441</td>
</tr>
<tr>
<td>Rooms to Let</td>
<td>30.6%</td>
<td></td>
<td></td>
<td></td>
<td>1569</td>
</tr>
<tr>
<td>Furnished</td>
<td>25.3%</td>
<td></td>
<td></td>
<td></td>
<td>1299</td>
</tr>
<tr>
<td>“All improvements”</td>
<td>26.1%</td>
<td></td>
<td></td>
<td></td>
<td>1337</td>
</tr>
<tr>
<td>Number of Rooms</td>
<td>4.5</td>
<td>3.1</td>
<td>1</td>
<td>22</td>
<td>5130</td>
</tr>
</tbody>
</table>

Notes: Distance to Downtown was calculated using the latitude and longitude for the corner of Wall Street and Broadway. The nearest core is either Downtown, or Grand Central Station. Nearby is defined as within a .5 mile radius. Subway or Elevated Station points means access points to enter either form of transport.
Table 2: Preliminary OLS Results

<table>
<thead>
<tr>
<th>Dep Variable</th>
<th>Sample with Apartment Size from Advertisements</th>
<th>Sample of Apartments and Rooms to Let</th>
<th>Sample of Houses Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln(monthly rent)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ln(number rooms)</td>
<td>.84*** (.05)</td>
<td>.86*** (.05)</td>
<td>.67*** (.07)</td>
</tr>
<tr>
<td>ln(number baths)</td>
<td>.39*** (.10)</td>
<td>.38*** (.06)</td>
<td>.16 (.18)</td>
</tr>
<tr>
<td>board included</td>
<td>.46*** (.03)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>furnished</td>
<td>-.13*** (.04)</td>
<td>-.17** (.05)</td>
<td>.34** (.12)</td>
</tr>
<tr>
<td>apartment</td>
<td>.08*** (.02)</td>
<td>.07*** (.02)</td>
<td></td>
</tr>
<tr>
<td>house</td>
<td>.15*** (.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>corner building/unit</td>
<td>.06** (.02)</td>
<td>.04* (.02)</td>
<td>.37* (.21)</td>
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<td>hall room</td>
<td>-.24*** (.05)</td>
<td>-.24*** (.06)</td>
<td></td>
</tr>
<tr>
<td>front room</td>
<td>.06*** (.02)</td>
<td>.08*** (.02)</td>
<td></td>
</tr>
<tr>
<td>elevator</td>
<td>.20*** (.04)</td>
<td>.18*** (.04)</td>
<td></td>
</tr>
<tr>
<td>heating</td>
<td>.04 (.03)</td>
<td>.05 (.03)</td>
<td>.39** (.16)</td>
</tr>
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<td>electricity</td>
<td>.25*** (.08)</td>
<td>.23** (.08)</td>
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<tr>
<td>gentlemen only</td>
<td>-.07** (.03)</td>
<td>-.07* (.04)</td>
<td></td>
</tr>
<tr>
<td>fireproof</td>
<td>.19***</td>
<td>.18**</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Coefficient (SES)</td>
<td>Coefficient (SES)</td>
<td>Coefficient (SES)</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-------------------</td>
<td>-------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>janitor in building</td>
<td>.07*** (.01)</td>
<td>.07*** (.02)</td>
<td></td>
</tr>
<tr>
<td>distance to core</td>
<td>.03 (.05)</td>
<td>.005 (.05)</td>
<td>.24** (.09)</td>
</tr>
<tr>
<td>no. subway or L station stops nearby</td>
<td>.003 (.003)</td>
<td>.002 (.002)</td>
<td>.009 (.005)</td>
</tr>
<tr>
<td>distance to marsh</td>
<td>.18*** (.04)</td>
<td>.20*** (.04)</td>
<td>.20 (.14)</td>
</tr>
<tr>
<td>distance to closest park</td>
<td>-.03 (.06)</td>
<td>-.034 (.06)</td>
<td>-.39*** (.09)</td>
</tr>
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<td>elevation</td>
<td>.003 (.002)</td>
<td>.002 (.002)</td>
<td>-.006 (.01)</td>
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<td>Year Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Period Dummies</td>
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<td>Yes</td>
<td>Yes</td>
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<td>Newspaper Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Month Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Neighborhood Dummies</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>R²</td>
<td>.74</td>
<td>.73</td>
<td>.75</td>
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<tr>
<td>Observations</td>
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<td>4183</td>
<td>441</td>
</tr>
</tbody>
</table>

Notes: Standard errors are clustered at the neighborhood level (I define 14 neighborhoods on the island of Manhattan).
Appendix

Examples of Newspaper Advertisements Utilized in this Project

1. New York Times, March 3rd, 1880

TO LET—THE ENTIRE DWELLING PART OF
No. 76 6th-av., north-east corner of Waverley-place;
good stand for millinery or dress-making; five rooms;
rent, $500; possession May 1.

Also, the store and front basement room No. 129
Waverley-place; $30 per month; no liquor; immediate
possession.

Also, on 10 years' lease, the buildings No. 46 Hudson-
st. and No. 88 Thomas-st.; let forms an L; rent, $2,500.

THORNTON M. RODMAN, Real Estate Agent,
No. 696 Broadway, corner 4th-st.

STORE AND BASEMENT TO LET ON
Broadway, near Bleecker-st. $2,200; bargain; also,
fine corner store, near A. T. Stewart's, very low.

E. A. CRUIKSHANK & CO., No. 68 Broadway.

TO LET—THE STORE AND DWELLING NO. 8
Bowery; excellent business position; rent, $2,250;
possession May 1. THORNTON M. RODMAN, Real
Estate Agent, No. 696 Broadway, corner 4th-st.


Furnished Rooms.
150c. a line 1 time; 3 times 120c. a line a
day; 7 times 10c. a line a day.

West Side.

87TH AV. 61.—Square, front, one flight; electricity; steam heat; gentlemen; permanent;
$5. Campbell.

97TH ST. 28 WEST.—Comfortably furnished
rooms; continuous hot water; all conveniences; light; reasonable.

127TH ST. 126 WEST.—Furnished room; run-
ing water; telephone.

157TH ST. 252 WEST.—Newly furnished rooms;
hot and cold water; telephone; private house.

17TH ST. 44 WEST.—Large, smaller, front,
rear rooms, suitable 1 or 2; $2-$3 up.

18TH ST. 26 WEST.—Newly furnished rooms;
single and double; $2 up; heated; all conven-
tiences. S. Addig & Co.