

**Title:** Condominium Conversions in San Francisco: GIS Analysis of Determinants

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**Abstract:** California has one of the most expensive housing markets in the nation. The lack of affordable housing production contributes to steadily increasing home prices and rents. The 1980s condominium conversion trend has resurfaced as a way for developers to cash in on demand for ownership condominiums from entry-level buyers, investors, and baby boomers. This paper uses GIS to examine determinants of condominium conversions, including owner-occupied house prices, rents, and the characteristics of the housing stock. Data from the San Francisco Department of Public Works and U.S. Census block group data are employed to test the condominium conversion model. The model also predicts the reservation rent—the point at which an investor is indifferent between renting out the unit or selling it. Lessons for public policy about condominium conversions are developed.

## **I. Introduction**

In this paper we examine the determinants of condominium conversions in San Francisco. This paper builds on our earlier paper on condominium conversions.<sup>1</sup> In this paper, we focus on the spatial trend in condominium conversions over a longer period to time – from 2000 to 2003. We assess whether the factors we identified in our earlier paper – price-to-rent ratio, median income, and ethnic variables – have the same or different impacts over this longer period of time. To keep the discussion self-contained, we briefly outline the theory and institutional background presented in that earlier paper.

We outline an economic model of condominium conversions that includes both supply-side and demand-side elements. We examine the robustness and predictions of the model by implementing it using GIS. This paper focuses on the trend over time in condominium conversions and the explanation for this trend in terms of the underlying economics of condominium conversions.

There is a tremendous demand for affordable ownership and rental housing in California. However, affordable housing production is inadequate. According to *Locked*

*Out 2004: California's Affordable Housing Crisis*, the lack of production, particularly the lack of rental housing production, contributes to steadily increasing home prices and rents. Inadequate housing production coupled with increased demand due to population growth and immigration has resulted in California having the most expensive housing of any state in the nation.<sup>2</sup> Due to the affordability crunch and changing demographics many homebuyers are purchasing smaller homes such as condominiums or other attached homes.<sup>3</sup> The market has responded to the demand for ownership condominiums in part through condominium conversion, defined generally as the conversion of rental apartments to ownership condominiums.

Condominium conversions change the balance between rental and ownership housing. Therefore, they present local government with complex challenges. On one hand, condominium conversions provide a response to the strong demand for ownership housing opportunities for a growing segment of society, and they also benefit the municipality in which they occur. Condominium conversions improve the housing stock through upgrades before sales and conversions increase property values from sale of the units.<sup>4</sup> They may also carry other social benefits such as contributing to more stable neighborhoods where children do better in school and are less likely to get involved with crime.<sup>5</sup>

However, condominium conversions reduce the apartment rental inventory, thereby increasing rents. Thus, conversions limit housing options for low-income people. Additionally, there are costs, tangible and intangible, associated with tenant displacement. Tangible costs include tenant relocation assistance. Intangible costs include disruption to the life of the tenant from a forced move.

San Francisco has grappled with these challenges since 1979 when it began regulating condominium conversions.<sup>6</sup> Many believe that increasing access to homeownership for existing renters is an important public policy goal for San Francisco,<sup>7</sup> since The City has one of the most expensive housing markets in the nation for both ownership and rental housing.<sup>8</sup> Due to the limited supply of developable land in San Francisco, condominium conversion is viewed as an easier way to expand homeownership opportunities than new construction.<sup>9</sup>

San Francisco is an overwhelmingly rental-oriented city. The map in Appendix 1 (Figure A1.1) of San Francisco census tracts indicates the proportion of rental housing units to owner-occupied housing units (for the year 2000).

San Francisco formally defines condominium conversion to mean “.... a subdivision which changes the type of ownership of real property to that defined as a Condominium project, Community Apartment project or Stock Cooperative and in which two or more condominiums, community apartments or units in a stock cooperative are newly created wholly or in substantial part within an existing structure or structures, regardless of the present or prior use of such structures and of whether substantial improvements have been made to such structures.”<sup>10</sup> San Francisco’s official policy towards condominium conversions as expressed in The City’s General Plan Housing Element Policy 2.3 states that conversions should not disrupt the balance between rental and ownership units. Displaced tenants or tenants likely to be displaced should be protected to the maximum extent possible. These policies are implemented by closely evaluating conversions and limiting the number of conversions annually.<sup>11</sup> The City’s condominium conversion process has evolved over the past 27 years into a thorough and sophisticated process.

Beginning in 1979, the County of San Francisco Board of Supervisors began regulating condominium conversions by amending the subdivision code to allow the conversion of existing rental units into condominiums if 40 percent of tenants indicated intent to purchase their unit.<sup>12</sup> There were some provisions for the preservation of low- and moderate-income housing; however there was no limit on the size of the building or the number of units that could convert.<sup>13</sup> A subsequent study of the effects of the regulations found that many tenants had been paid to sign the intent to purchase their units and that many units had been bought by investors. In addition, many converted condominium units were vacant. Due to the problems with enforcing the tenant protection provisions of the regulations and the high vacancy rate of converted units, in 1982 the Board of Supervisors placed a moratorium on condominium conversions to address the problems with the existing regulations.<sup>14</sup> Soon thereafter the Board adopted an updated condominium ordinance incorporating two key features, 1) large complexes built for rental housing and occupied by tenants could not convert, and 2) condominium conversions were limited to owner-occupied buildings of six units or less and to only 200 applications (i.e., buildings) per year.<sup>15</sup>

A lottery system has been designed to allocate approvals for condominium conversion in San Francisco. Lottery tickets are sold annually for a fee of \$150.00 per building with only one lottery ticket for each building for first year applicants. Only owners with a letter of authorization, signed affidavits from all building owners, and a grant deed are allowed to purchase tickets. Additionally, participants must certify that no eviction of a senior, disabled person, or catastrophically ill tenant has occurred.<sup>16</sup> On lottery day (usually in February), the first 200 units drawn are eligible to apply for

conversion that year. The additional participants are wait-listed. Losing properties may reapply and buy additional tickets for each year proof is provided of being wait-listed.<sup>17</sup> To get a sense of the strong demand for condominium conversions, in 2006, over 400 properties were wait-listed containing over 800 units.<sup>18</sup> Because of the peculiarities of the San Francisco ordinance governing condominium conversions, no extant model exactly fits the situation, but elements of previously published models are incorporated in ours.

## **II. Literature Review**

There is a vast literature on the demand for housing and the supply of housing. Our review focuses only on those contributions that are most significant in understanding the demand for and supply of condominium conversions.

First, we will examine some determinants of demand for owner-occupied housing. From the point of view of traditional economic theory, income, the price of owner-occupied housing, and the price of rental housing (a substitute for owner-occupied housing) are the most significant demand-side variables. However, racial and ethnic composition has been identified in the literature as important in determining homeownership rates. Studies have shown that, holding other factors constant, households of Chinese ancestry have higher homeownership rates, and households of African American ancestry have lower homeownership rates than the average.<sup>19</sup>

The supply side factors that affect housing include construction costs, availability of residentially zoned land, public policy regarding conversions, and the restricted supply of entry level homes. High construction costs lower the level of new construction, thereby constraining the housing stock of an area.<sup>20</sup> The availability of residentially zoned land influences the supply of housing. Growth management ordinances, development impact

fees, and preferences of local government for fiscally lucrative commercial development act to limit the housing opportunities within a jurisdiction.<sup>21</sup> These regulations significantly reduce the supply of rental housing.<sup>22</sup> This results in pressure to provide owner-occupied housing through condominium conversions. Local public policy in the form of condominium conversion ordinances influences the rate of conversion activity.<sup>23</sup>

### **III. Model**

The economic model of condominium conversions is based on the expected advantage of the individualized ownership compared with either renting or tenancy-in-common. As a general proposition, ownership has benefits and costs compared to renting. Depending on these benefits and costs a rational individual chooses the tenancy form that is best. Because the benefits and costs can differ by individuals rational decision makers can make different decisions about renting or owning. For example, some people are handy with tools, so the costs of being an owner-occupier may be less for such an individual than for someone who is not handy.

Individualized ownership provides several advantages: the property right has a survivorship, but perhaps more importantly, the property right provides the possibility of more control over the space occupied. Both these considerations mean that the asset value of individualized ownership is greater than the asset value of tenancy-in-common.<sup>24</sup> We can refer to the difference between these values as the “individualized property right premium.”

If the individualized property right premium is sufficiently large, then all tenants-in-common will favor changing the ownership structure to individualized ownership. The individualized property right premium must be greater than the costs of conversion.

These costs of conversion may include modifications to the structure to make individualized units possible (e.g., separate metering of gas and electricity). However, in the San Francisco case, it is likely that the costs of conversion are more closely tied to two circumstances:

- a.) City-imposed fees for conversions;
- b.) Costs associated with code compliance for properties that are accepted for conversion

The size of the individualized property right premium depends on several factors:

- a.) the age of the prospective owner; the older the owner, the shorter is the time horizon, and, thus, the greater is the focus on disposal of assets;
- b.) individual preferences concerning disposal of assets to beneficiaries;
- c.) the value of the real property relative to total assets; the greater is the value of real property to total assets, the more valuable will be the possibility of directing the asset to survivors;

The comparison of individualized ownership vs. renting is more fully developed in the literature. The focus is on a comparison of the user cost of housing for each tenure type. Renting is a stream of payments over the term of the rent tenure. From the landlord's point of view this stream of payments is an asset. From the renter's point of view, the stream of payments is a liability. Ownership likewise involves a stream of payments from the owner's perspective – usually in the form of mortgage payments. These payments go toward an asset that has one crucial distinguishing characteristic compared to the stream of rental payments: the right to sell the property.

Comparison of these streams of payments is complicated by tax considerations. Mortgage interest payments on the primary owner-occupied residence are tax-deductible. Likewise, costs incurred in maintaining a rental property are tax deductible, and rental property owners may receive investment tax credits. These tax considerations mean that the streams of payments of rents and mortgages must account for the tax considerations for the demand-side of the owner-occupied market (mortgage interest deductibility) and for the supply-side of the rental property market (tax treatment of costs and investment credits).

Roughly speaking, the choice model of renter vs. owner involves a comparison of the discounted present value of the stream of payments associated with each tenure type. The household will choose the tenure type that corresponds to the lowest user cost of housing. However, straightforward comparison of the discounted present values of the streams of payments does not account for some important considerations. Most significant are imperfections in capital markets: people cannot borrow unlimited sums of money; they cannot even borrow sums of money they might credibly repay. Due to the problems of moral hazard and adverse selection, limitations are placed on borrowing in the form of downpayments, income qualification, credit histories, etc.

Households will gravitate toward the rental tenure type if:

- a.) they have lower income;
- b.) they have poorer credit histories;
- c.) the household size is smaller (no or few children);
- d.) the household is younger – mobility is more important;



e.) the household belongs to a particular ethnic group; some ethnic groups emphasize the cultural value of ownership more than others.

The San Francisco lottery means that all these considerations must be viewed through the lens of uncertainty. The *expected value* of the streams of payments (accounting for tax and other considerations) is the significant factor. Furthermore, there is a *transactions cost* associated with the filing of paperwork and the need to meet all the bureaucratic requirements for applying for conversion.

The long run equilibrium condition states the relationship that must obtain between the price on the ownership market and the price on the rental market. Rental housing and owner-occupied housing are substitutes in consumption (that is, they are substitutes from the point of view of demanders). Rental housing and owner-occupied housing are also substitutes in investment (that is, they are substitutes from the point of view of suppliers). The long run equilibrium condition means that the price of the asset must equal the discounted present value of the stream of payments derived from that asset. If the asset returns a fixed amount  $R$  and lasts forever, this relationship will be<sup>25</sup>

$$(1) \quad P = R/r.$$

If the asset has a finite life or if the stream of returns varies over time, the long run relationship between prices and rents will be more complicated. An important additional complication concerns expectations about future prices and future rents. Housing markets in particular may be subject to price bubbles. This means that there may be substantial

deviation from the long run equilibrium relationship between prices and rents.<sup>26</sup>

Nonetheless, a relationship like (1) is an important benchmark.

The short run equilibrium condition determines the price of owner-occupied housing and the rent based on equating the quantities demanded on each of these markets with the quantities supplied in the short run. The difference between the short run equilibrium and the long run equilibrium concerns the adjustment of supply. In the long run, quantities supplied on the owner-occupied market and quantities supplied on the rental market reflect adjustments made by investors so that returns to each type of investment are equalized. In the short run, such equalization of returns may not occur.

Indeed, the fact that investors cannot adjust the investment type at will (because there is a San Francisco ordinance that prohibits such changes) suggests that the long run equilibrium condition will not be achieved. That there are applications for conversion that are not granted suggests that in many cases the price-rent configuration would make conversion advantageous. If there is no expectation of price appreciation then the ratio of owner-occupied price to rent must be greater in the short run equilibrium than in the long run equilibrium (as discussed in detail in our previous paper).

In the short run, the price of owner-occupied housing is determined by the supply of owner-occupied units, and by factors affecting the demand for owner-occupied units – in particular income. We assume that owner-occupiers to have higher income than renters (which is substantiated by the data). If the owner-occupied market and the rental market are in short run equilibrium, but not in long run equilibrium, and if the adjustment would be toward more owner-occupied housing, then the ratio  $(P^*r)/R$  implied by expression (1) would be greater than if long run equilibrium was obtained.

#### **IV. Data**

Data used in this analysis are drawn from three sources, 1) United States Census Bureau 2) San Francisco Enterprise GIS website, and 3) San Francisco Department of Public Works. The data provide detailed information about the characteristics of the population and housing stock as well as the amount and location of condominium conversions applications (both successful and unsuccessful). The majority of the data was obtained for the year 2000 for all block groups in San Francisco County unless otherwise noted.

Census 2000 Summary File 3 (SF3) was used to obtain detailed housing data. The data contains information about housing stock characteristics such as number of units within each structure as well as value and gross rent. Since San Francisco only permits conversions of buildings with six units or less, buildings with 2 to 6 units are targeted in our analysis.

The San Francisco Enterprise GIS website was used for downloading GIS layers for use in project maps. GIS layers obtained include The City's geographic features such as streets, water bodies, and public buildings. Characteristics of the population such as race and income were also downloaded as layers and mapped.

The San Francisco Department of Public Works provided extensive information about the number and location of condominium conversion applications throughout The City. Data was provided for the years 1999 to 2006 for all active and recorded condominium conversions.

Demand side variables used in this analysis include median income, percent Asian, and percent African American as well as the price-to-rent ratio. The interest rate used in

calculations was obtained from the Federal Home Loan Bank Board. Supply side variables used in the analysis include the percent of housing units that are rental, the percentage of housing units between 2-6 and the amount of recorded condominium conversions.

Median household income within the block group and the percentage Asian or African American are included as demand side variables used to predict the likelihood that inhabitants of various block groups will be attracted to owner-occupied housing, and hence, be more likely to attempt condominium conversion. According to the cited literature, the higher the median household income and the higher the percentage Asian, the more likely is the household to attempt condominium conversion. The lower the median household income and the higher the percentage African American, the lower is the likelihood of the household to attempt condominium conversion. Income status and racial propensities for homeownership is supported by the literature.

The price to rent ratio is expressed as:  $[(P*r)/12]/R$  where  $P$  = value of owner occupied house;  $R$  = rent;  $r$  = interest rate. Price and rent data was obtained from the US Census 2000 SF3. The mortgage interest rate for December 1999 was obtained from the Federal Home Loan Bank Board. The higher the price to rent ratio, the more favorable of an option is homeownership, thus contributing to the demand for condominium conversions.

The percentage of rental housing units that are in critical range (2-6 unit buildings) in each block group is used to determine the amount of buildings that will meet the City's initial requirements for condominium conversion. As previously discussed, the City only

allows building of six units or less to convert. Actual condominium conversion applications, both proposed and completed conversions, are used to calibrate the model.

## **V. Empirical Methods**

We created GIS layers for price-to-rent ratio, median income, percent Asian, and percent African American by block groups for the County of San Francisco. We geocoded the addresses of all condominium conversions for the years 2000 through 2003. We created map overlays of the condominium conversions with layers representing the four main variables of interest (price-to-rent ratio, median income, percent Asian, and percent African American).

## **VI. Results**

The results displayed by the GIS maps are consistent with the main predictions of the condominium conversion model. The ethnic variables considered (especially percent Asian) do not appear to be strongly associated with condominium conversions. We discuss possible explanations for this below. Four layers including the variables price-to-rent ratio, median income, percentage Asian, and percentage African American were mapped against a layer for actual condominium conversions that took place in each of the years 2000 through 2003, resulting in four maps per variable. We present a complete set of maps updating our earlier paper only for price-to-rent ratio and median income. These are the variables that were strongly related to condominium conversions in our earlier study, and these are the variables whose effect through time we wish to trace.

Maps indicating the effect of percent Asian and percent African American are presented only for the latest year. Both variables are weakly correlated with condominium conversions, which confirms the observations in our earlier study.

Although our results are strongly suggestive, a few caveats are in order. The most significant limitation of the analysis is that it involves aggregated data (at the block group level), not transactions data. This means that we ascribe to transactions (condominium conversions) features of the aggregated variable. Furthermore, we do not have information on the actual characteristics of the condominium conversions. Therefore, we cannot say the degree to which these units differ from the typical housing unit in the same block group.

### **Price-to-rent ratio**

Figures 1A through 1B below shows the price-to-rent ratio overlaid with condominium conversions for the years 2002 through 2003. These figures (and Tables 1 and 2 for the years 2000 and 2001) show that condominium conversions are concentrated in areas with a higher price-to-rent ratio, which is consistent with the theory we presented.

That condominium conversions are concentrated in areas where the price-to-rent ratio is higher is indicated by the following data.

**Frequency Distribution Condo  
Conversions per Blockgroup in  
2000**

Classes	Frequency
0.00	2
0.01 - 1.00	2
1.01 - 1.50	5
1.51 - 2.00	36
2.01 - 2.50	35
2.51 - 3.00	23
3.01 - 3.50	16
3.51 - 4.00	11
4.01 - 4.50	6
4.51 - 5.00	0
5.01 and over	0
Total	136

**Table 1.**

**Frequency Distribution Condo  
Conversions per Blockgroup in  
2001**

Classes	Frequency
0.00	2
0.01 - 1.00	3
1.01 - 1.50	13
1.51 - 2.00	27
2.01 - 2.50	45
2.51 - 3.00	30
3.01 - 3.50	20
3.51 - 4.00	9
4.01 - 4.50	3
4.51 - 5.00	2
5.01 and over	1
Total	155

**Table 2.**

This concentration of conversions in areas with a higher price-to-rent ratio is consistent with observations for the following two years, 2002 and 2003, as indicated by the following figures.

## San Francisco - Blockgroups

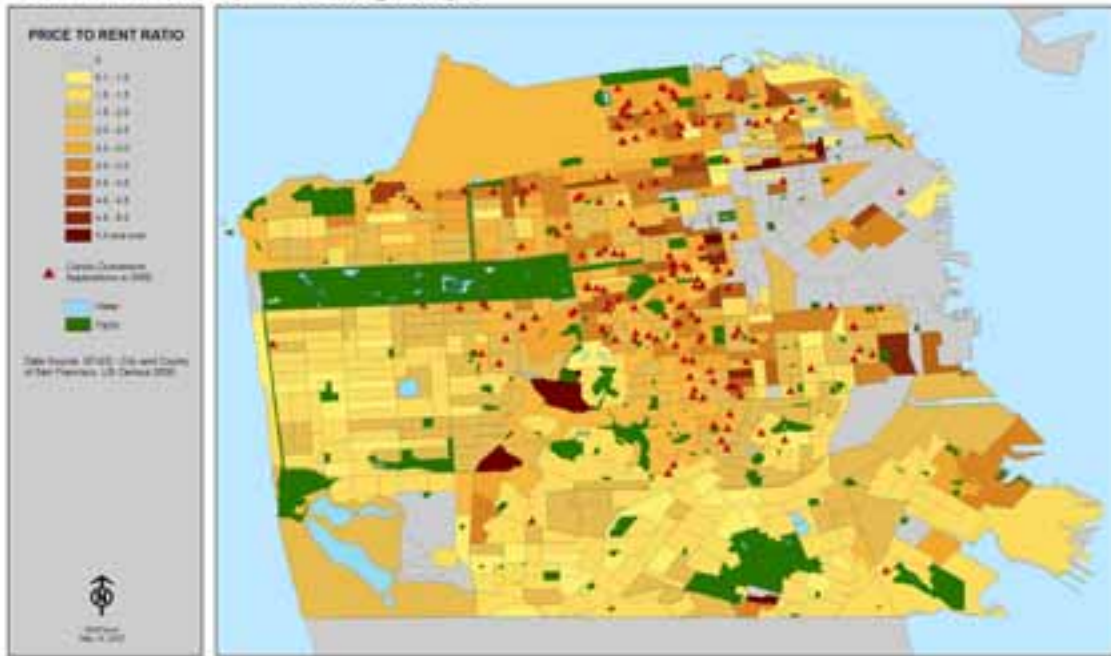


Figure 1A. Price-to-rent ratio and Condominium Conversions, 2002

## San Francisco - Blockgroups

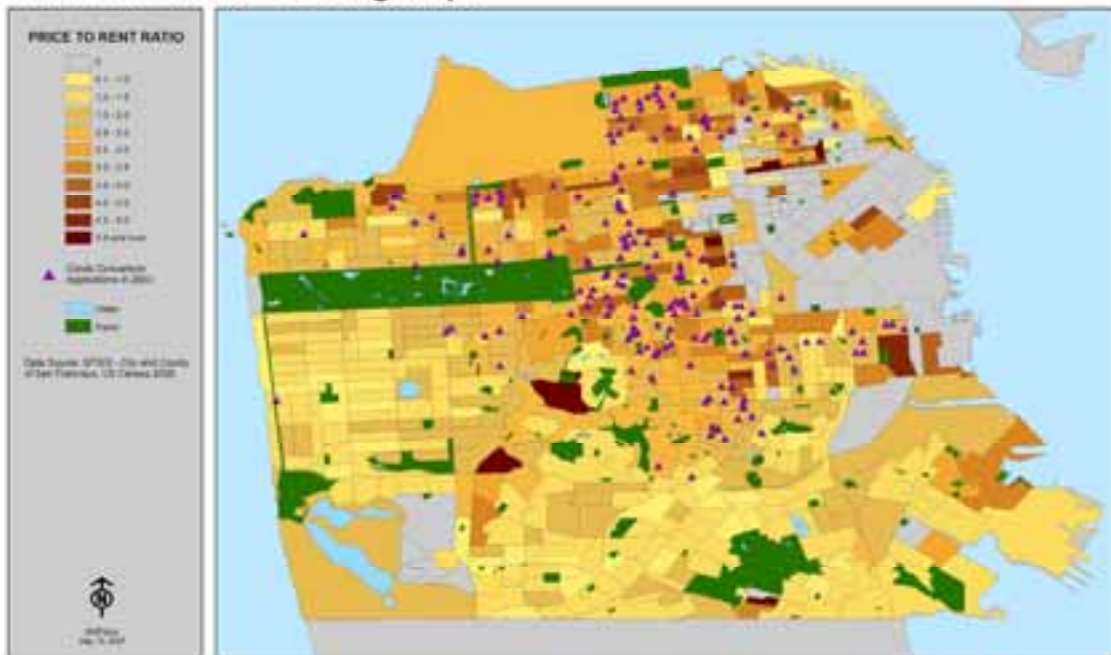


Figure 1B. Price-to-rent ratio and Condominium Conversions, 2003



The number of conversion applications has increased over the entire period, but their concentration in particular census block groups has not changed much. Recalling the map of the distribution of the rental housing stock in San Francisco (Appendix 1) it is clear that the conversions are concentrated in areas where the proportion of owner-occupiers is small.

### **Median Income**

Broadly speaking, the median income map showed that in areas with higher income, more condominium conversions took place. Figures 2A through 2B show median income overlaid with condominium conversions for the years 2002 through 2003. Condominium conversions are concentrated in areas with a higher median income, which is consistent with our assumption that the advantages to owner-occupier status is increasing in income. (In economic parlance, owner-occupier status is a “normal” good – the consumption of which increases with income.)

Although the majority of condominium conversions occur in block groups where the median income is high, a significant number occur in areas of mid-level median income. However, these areas of mid-level median income border areas of high median income. So, the occurrence of condominium conversions in these areas may be related to “gentrification,” which is more likely to occur in border neighborhoods. The assumption we use concerning the connection between income and the desire to convert is supported, but not as strongly as the connection between the price-to-rent ratio and conversions. This is indicated by the following data

**Frequency Distribution Condo  
Conversions per Blockgroup in  
2000**

<b>Classes</b>	<b>Frequency</b>
0 - 29,999	1
30 - 49,999	11
50 - 69,999	78
70 - 89,999	29
90 - 109,999	8
110,000 and over	9
Total	136

**Table 3.**

**Frequency Distribution Condo  
Conversions per Blockgroup in  
2001**

<b>Classes</b>	<b>Frequency</b>
0 - 29,999	0
30 - 49,999	21
50 - 69,999	67
70 - 89,999	45
90 - 109,999	11
110,000 and over	11
Total	155

**Table 4.**

This concentration of conversions in areas with a higher price-to-rent ratio is consistent with observations for the following two years, 2002 and 2003, as indicated by the following figures.

## San Francisco - Blockgroups

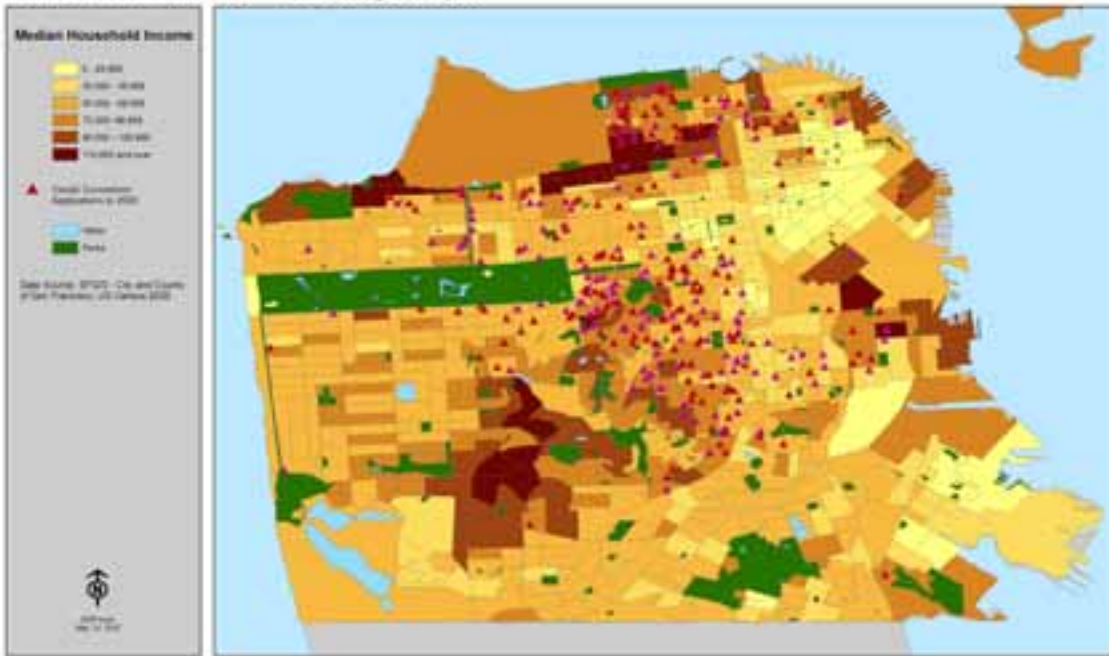


Figure 2A. Median Income and Condominium Conversions, 2002

## San Francisco - Blockgroups

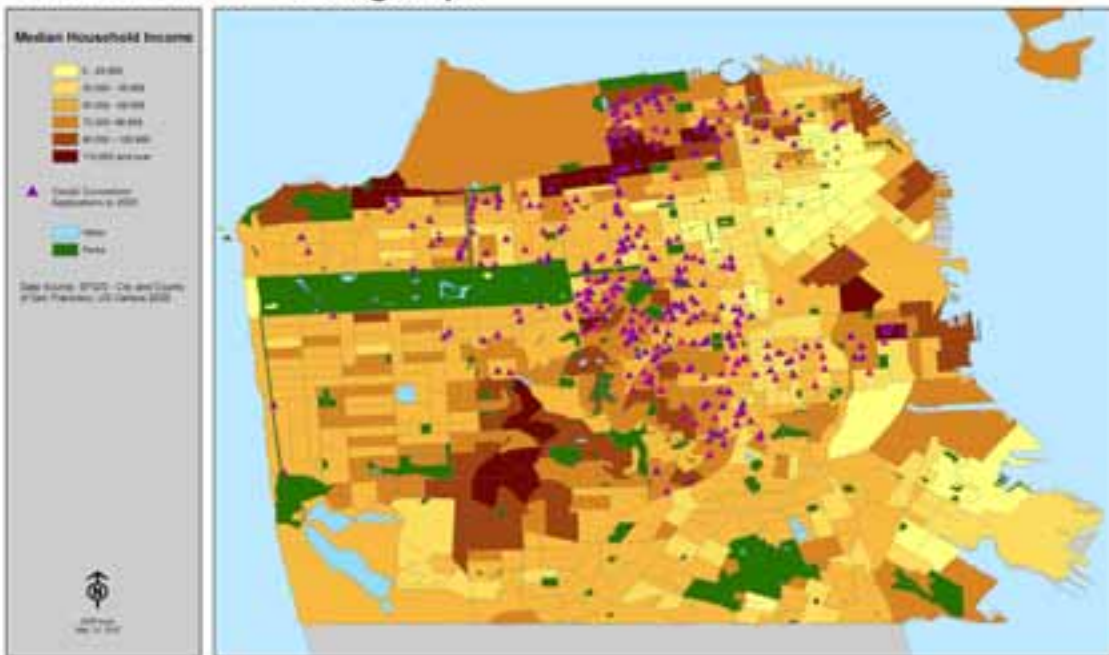


Figure 2B. Median Income and Condominium Conversions, 2003

### **Ethnic Variables**

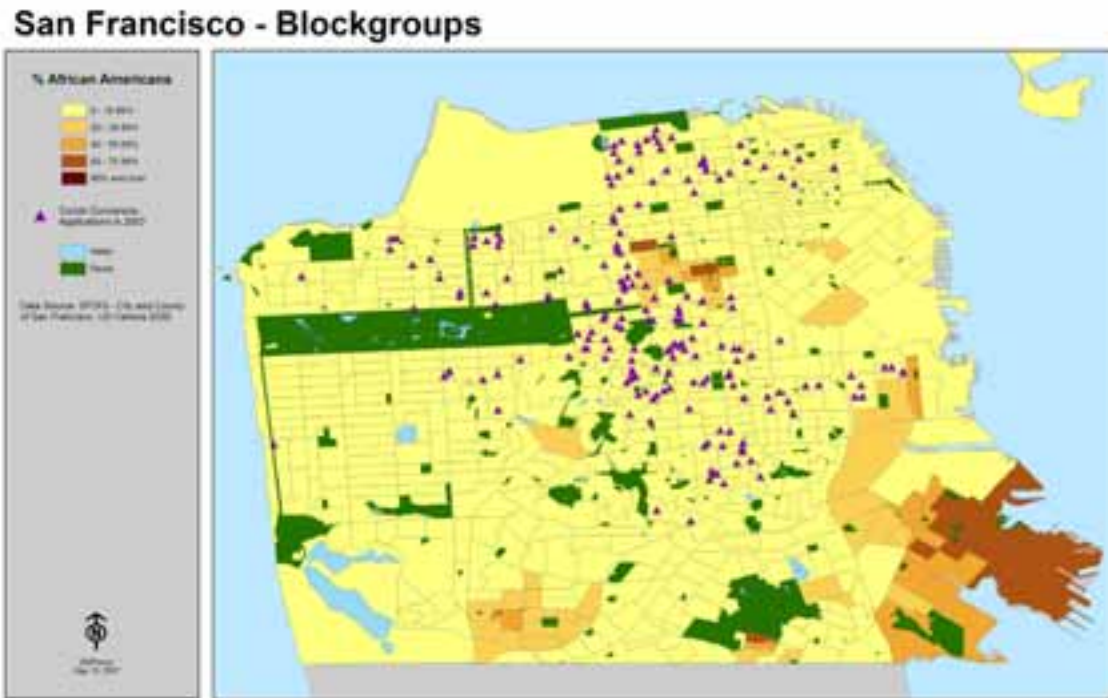
We examined the relationship between ethnic variables suggested by the literature on homeownership and condominium conversions. Specifically, we examined the relationship between the percentage Asian and the percentage African American and condominium conversions. We reported in our previous paper that the connection between condominium conversions and either Asian or African American background was weak. Examining the trend over a longer period of time does not alter that conclusion. Figure 3 shows percent Asian overlaid with condominium conversions for the year 2003. This figure shows that condominium conversions are not especially concentrated in areas with a higher percentage of Asian. One possible explanation for this is that the studies that form the basis for higher homeownership rates among Asians may be based on cases where Asians are a minority, and often at the higher end of the income scale. The large and diverse Asian community in San Francisco means that a broader range of income groups are included among Asians.

### San Francisco - Blockgroups



**Figure 3. Percent Asian and Condominium Conversions, 2003**

Figure 4 shows percent African American overlaid with condominium conversions for the year 2003. This figure shows that no condominium conversions occurred in areas that are substantially African American.



**Figure 4. Percent African American and Condominium Conversions, 2003**

## VII. Summary and Conclusions

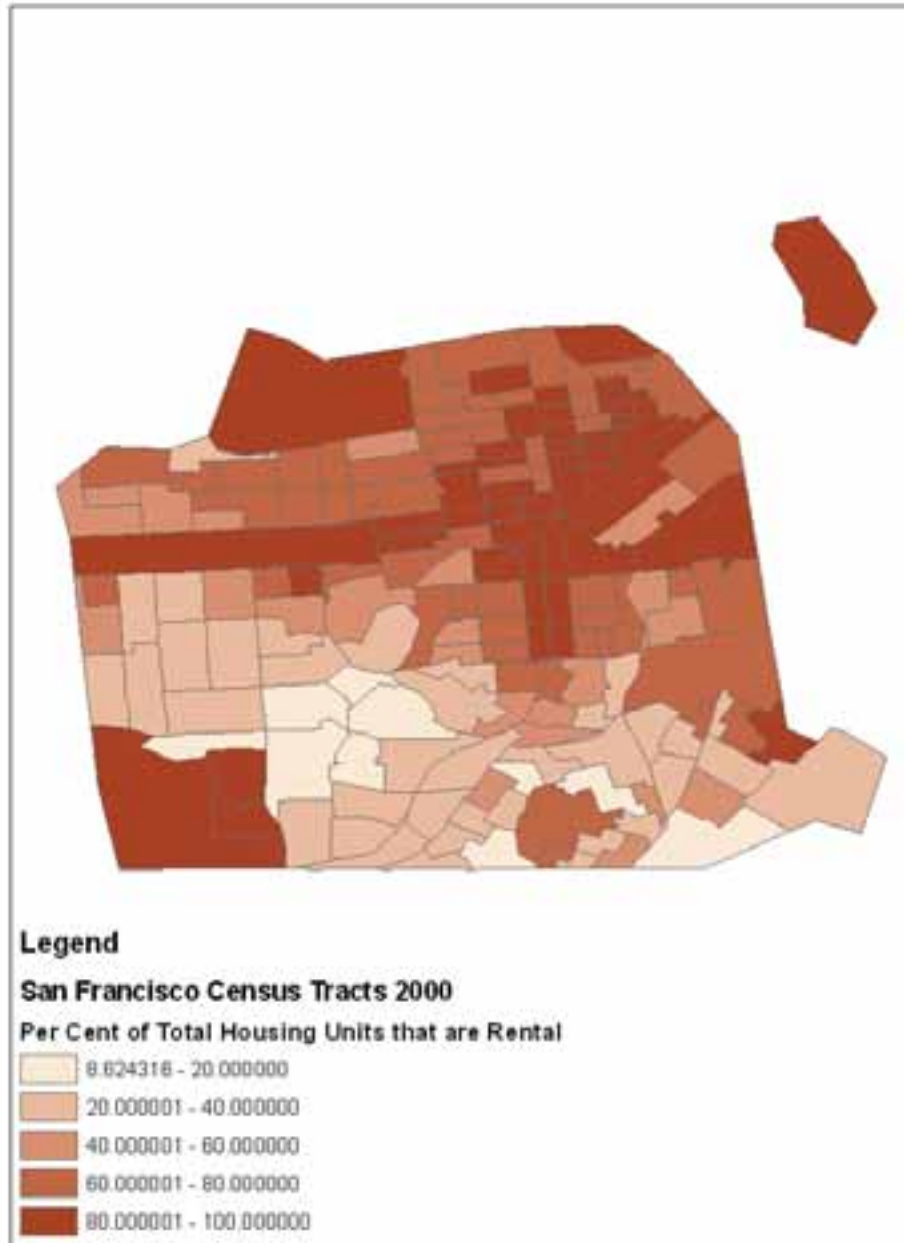
This paper has examined condominium conversions in San Francisco over a four year time period. An economic model testing the utility of various tenure forms was developed and calibrated using GIS. The results indicate that model of tenure choice indicating the significance of the price-to-rent ratio and median income as determinants of condo conversions is robust over a significant period of time. Likewise, the preliminary indications from our earlier paper that ethnic variables (specifically Asian or African American background) are not significant determinants of condo conversions are supported using data from the longer time period. GIS is shown to be a powerful tool for analyzing and illustrating the results of the research to inform policy decisions.

**Acknowledgements:** The authors wish to thank Cheryl Herrera, San Francisco

Department of Public Works, for data about condominium conversions in San Francisco, and Pete Reehling for helpful comments. Any remaining errors are our responsibility.

# Appendix 1. Figure A1.1

Snapshot of San Francisco Rental vs. Owner-Occupied Housing Stock





## Appendix 1 – continued

### Descriptive Statistics of San Francisco Census Tracts by Percent Rental Units

<i>Percent Rental Housing Units</i>	
Mean	62.08220334
Standard Error	1.905663892
Median	68.06861216
Mode	100
Standard Deviation	25.28148843
Sample Variance	639.1536573
Kurtosis	1.032267499
Skewness	0.367664263
Range	91.37568363
Minimum	8.624316365
Maximum	100
Sum	10926.46779
Count	176

**Table A1**

## Appendix 2

### Descriptive Statistics of the Data

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*Price to rent ratio (non-zero block groups)*

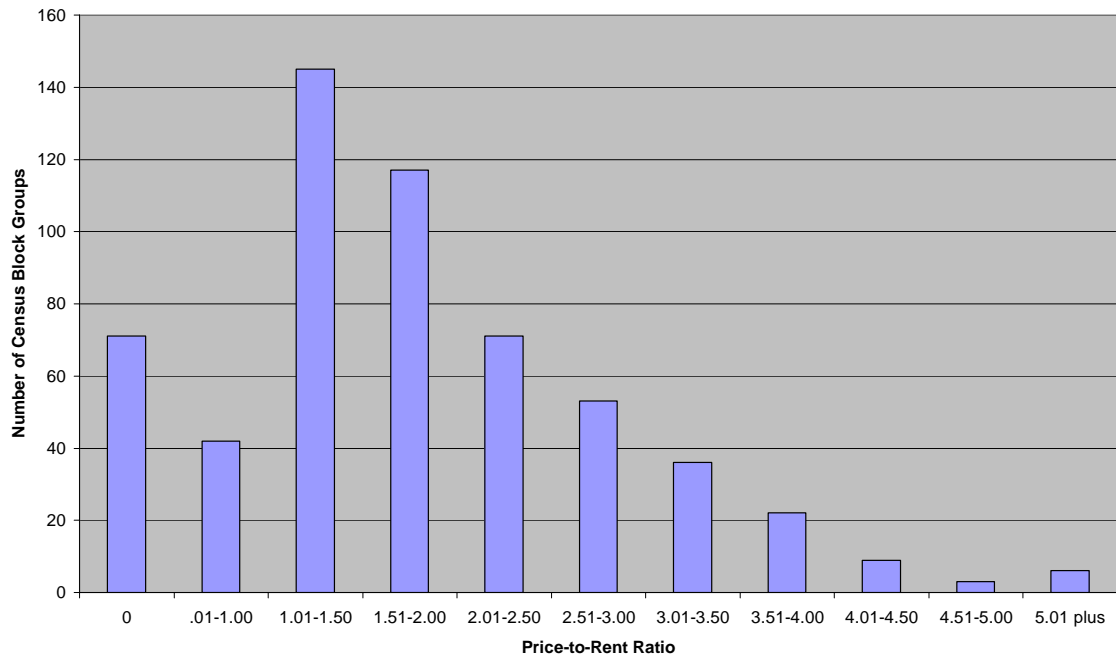
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Mean	2.005583
Standard Error	0.0484
Median	1.736713
Mode	2.020658
Standard Deviation	1.08658
Sample Variance	1.180657
Kurtosis	13.97734
Skewness	2.571468
Range	10.10089
Minimum	0.083837
Maximum	10.18473
Sum	1010.814
Count	504

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**Table A2.1**

**Census Block Groups in Price-to-Rent Ratio Categories  
(Total Number of Block Groups = 575)**

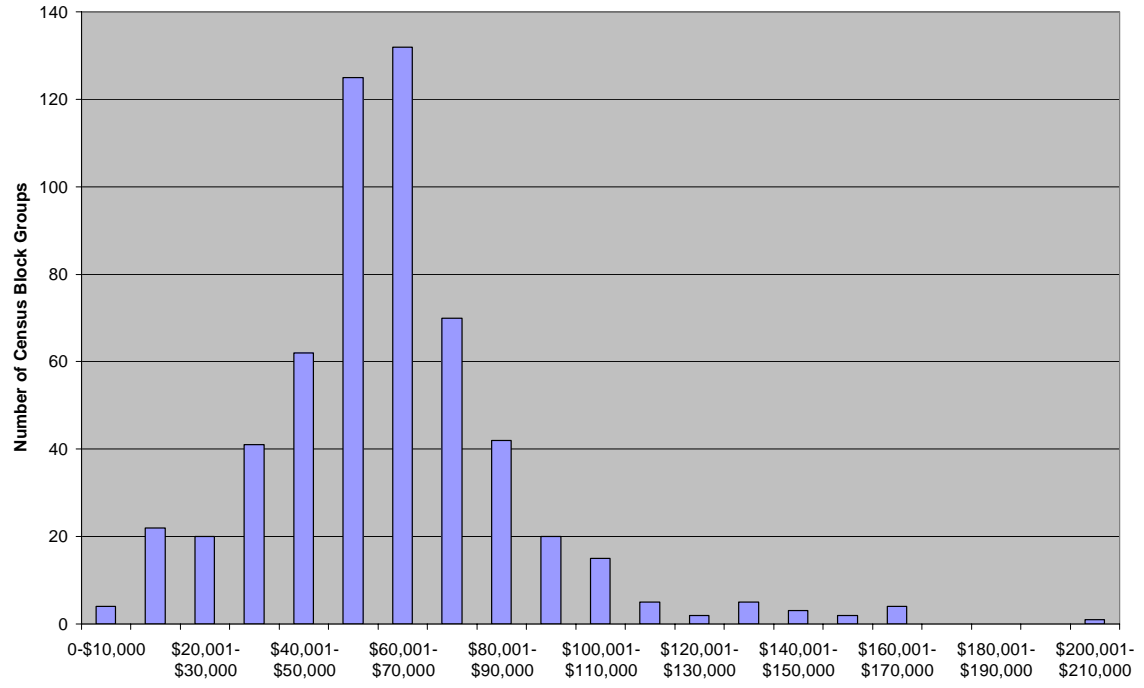


**Figure A2.1**

<i>Median Household Income 1999</i>	
Mean	62239.6
Standard Error	1067.332
Median	60781
Mode	73571
Standard Deviation	25593.72
Sample Variance	6.55E+08
Kurtosis	3.729942
Skewness	1.103879
Range	200001
Minimum	0
Maximum	200001
Sum	35787769
Count	575

**Table A2.2**

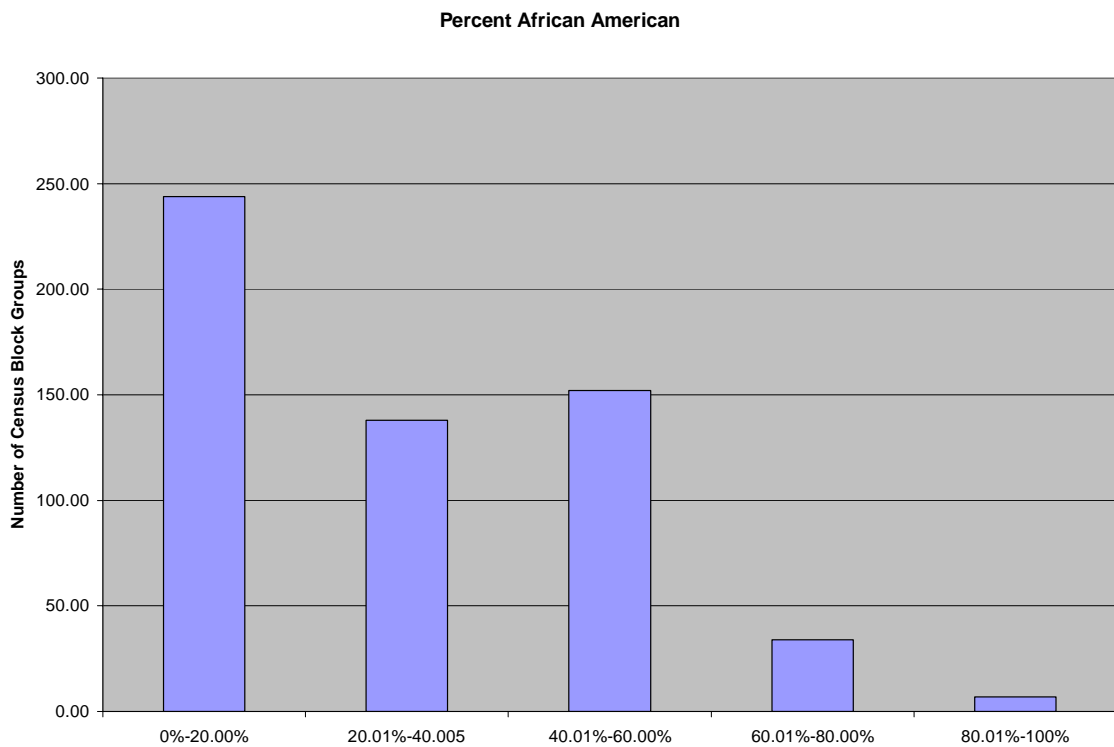
**Median Household Income in Census Block Groups**



**Figure A2.2**

<i>Percent African American</i>	
Mean	7.141577457
Standard Error	0.532248366
Median	2.331390508
Mode	0
Standard Deviation	12.76286745
Sample Variance	162.8907855
Kurtosis	9.20041513
Skewness	2.950479779
Range	73.59754396
Minimum	0
Maximum	73.59754396
Sum	4106.407038
Count	575

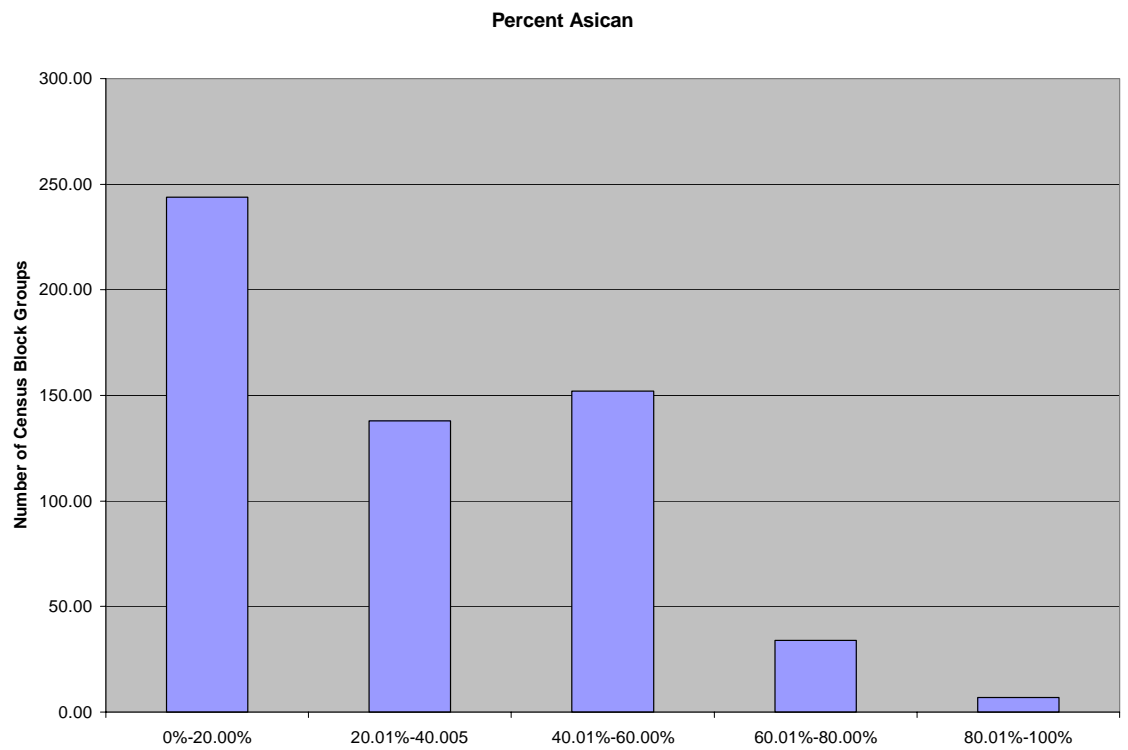
**Table A2.3**



**Figure A2.3**

<i>Percent Asian</i>	
Mean	29.40827
Standard Error	0.859924
Median	25.85366
Mode	0
Standard Deviation	20.62026
Sample Variance	425.1951
Kurtosis	-0.61112
Skewness	0.527423
Range	99.59535
Minimum	0
Maximum	99.59535
Sum	16909.75
Count	575

**Table A2.4**



**Figure A2.4**

## References

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<sup>1</sup> A more fully elaborated model is contained in our earlier paper, "Condominium Conversions and GIS: A Policy/Planning Support System," ESRI User Conference 2006 (p1905).

<sup>2</sup> Hans Johnson and Amanda Bailey. "California's Newest Homeowners." Public Policy Institute of California, *California Counts*. 7 (August 2005): 3.

<sup>3</sup> *Ibid.*, 14.

<sup>4</sup> George Sternlieb and James Hughes. "Condominium Conversion Profiles: Governmental Policy." *American Real Estate and Urban Economics Association* 3, 3 (1975): 76.

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<sup>7</sup> *Ibid.*, 1.

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<sup>12</sup> Gellen, 3.

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

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<sup>19</sup> Painter, Gary, Stuart, Gabriel, Dowell, Myers. 2000. Race, Immigrant Status, and Housing Tenure Choice. *Journal of Urban Economics*. 49: 155.

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<sup>21</sup> Ibid.

<sup>22</sup> Ibid.

<sup>23</sup> John Dinkelspiel, Joel Uchenick, and Herbert Selesnick. *Condominiums: The Effects of Conversion on a Community*. (Massachusetts: Auburn House Publishing Co., 1981), 124.

<sup>24</sup> Under tenancy-in-common, the right to occupy the space reverts to the common owners; under individualized ownership the right to occupy the space reverts to the survivor, or can be assigned by a will. Assuming that individuals care about the disposition of their property after their deaths, this means that the maximum price they would be willing to pay for an asset that can be passed on is greater than the maximum price they would be willing to pay for an asset with the identical characteristics that cannot be passed on.

<sup>25</sup> See DiPasquale and Wheaton (1996, p. 58).

<sup>26</sup> Shiller, Robert J., *Irrational Exuberance*, Princeton: Princeton University Press, 2000.