"There Goes the Neighborhood:"

How and Why Bohemians, Artists and Gays Affect Regional Housing Values

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Abstract

It is now a conventional wisdom that artistic, bohemian, and gay populations increase housing values in the neighborhoods and communities they inhabit. But these groups are small, and the evidence of their effect on housing prices is anecdotal. We argue that artists, bohemians and gays through two kinds of mechanisms: *aesthetic- amenity premium* and a *tolerance* or *open culture premium.* To examine this, we introduce a combined measure of bohemian and gay populations – the Bohemian-Gay Index. We conduct statistical analysis to test the efficacy and performance of this measure against other variables that are expected to affect housing values: income, wages, technology, and human capital. The findings indicate that the Bohemian-Gay Index has substantial effects on housing values across all permutations of the model and across all region sizes. It remains positive and significant alongside variables for regional income, wages, technology and human capital. The Bohemian-Gay Index also has a substantial direct effect on other key variables, particularly income, and because of that has an additional indirect effect on housing values.

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Introduction

"Want to know where a great place to invest in real estate will be five or 10 years from now? Look at where artists are living now," so wrote a 2007 *Business Week* story provocatively titled, "Bohemian Today, High-Rent Tomorrow." A wide body of studies has shown that artist and gay populations act as urban pioneers and that their location choices can have substantial upward effects on housing prices (Castells 1983; Ley 1994; Zukin 1995; Smith 1996). But artistic and gay populations are relatively small and the evidence of their direct effect on housing prices is limited and anecdotal. There are roughly 330,000 working artists in the United States and approximately 1.3 million total "bohemians" if we count everyone who works in arts, design, entertainment and media occupations, amounting to approximately 1.3 percent of the US workforce in 2000. There are 8.8 million self-identified gay and lesbian gay people in the United States, roughly 4 percent of the adult population (Gates and Ost 2004). Still, the basic idea that gay and bohemian populations effect on housing prices surely makes for good headlines. And the notion has become an accepted conventional wisdom among many urbanists and real estate developers. But, a basic question remains: Can groups that are this small really have a significant effect of housing prices? This is the core question for our research.

Housing prices, according to economic theory, are set at the intersection of supply and demand. Acting on the demand side are wages and income, while the availability of housing units conditions the supply side. Where new home building can occur relatively easily, supply increases to meet demand and prices stay more or less stable. Alternatively, when incomes rise in highly desirable areas or those with complex or constraining zoning, appreciation will be more rapid (Glaeser et al 2005, 2006). The rise of so-called "super-star cities" has been noted, where appreciation far outpaces the national average because these are desirable places where supply limited (Gyourko et al 2006). In certain markets, then housing commands a premium.

We argue that artistic and gay populations affect housing values through two classes of mechanisms. An important study by Glaeser et al (2001) finds that urban rents have risen faster than urban wages. They thus conclude that demand for location

is driven by something other than the wage level - an urban amenity premium. They introduce a simple formula for this: Urban Productivity Premium + Urban Amenity Premium = Urban Rent Premium. We extend this idea of an urban amenity premium, arguing that bohemians and gays affect housing values on the supply side through an *aesthetic-amenity premium*. Artists and bohemians are direct producers of amenities; their location will thus directly reflect higher levels of amenity. Furthermore, their location also reflects them. As selective buyers with an eye for amenity, authenticity and aesthetics, locations where artists, bohemians and gays concentrate are likely to be highly sought after for their cultural amenities, desirable neighborhood character, and aesthetic quality of the housing stock.

Second, we argue that bohemian, artistic and gay populations reflect a second premium – a *tolerance* or *open culture premium.* Markusen and Schrock (2006) describe an "artistic dividend" through which arts and cultural activities increase the vibrancy and diversity of metropolitan areas, influencing other industries and generating growth. Florida (2002a, b, c) introduced a measure of the producers of artistic and cultural amenities - the "Bohemian Index"- and found it to be associated with concentrations of talent and innovation. Florida and Gates (2001) found a positive association between concentrations of gay households and regional development. This tolerance or open culture premium acts on the demand side by reducing barriers to entry for human capital; increasing the efficiencies of human capital externalities and knowledge spillovers; promoting self-expression and new idea generation; and facilitating entrepreneurial mobilization of resources, thus acting on regional income and real estate prices.

Our argument can be summarized in a simple equation: Regional Income + Regional Amenity Premium + Regional Openness Premium = Regional Housing Values. We introduce a combined measure of bohemian and gay populations – the Bohemian-Gay Index as a proxy measure for regional amenity and regional openness. We then operationalize our model and use a variety of statistical techniques analysis to test the efficacy and performance of Bohemian-Gay Index against other variables that are expected to affect housing values: income, wages, technology, and human capital. Some might argue that bohemian and gay populations are not causal but instead are themselves a function of higher income, higher human capital locations.

Taking this into account, we separate the direct and indirect effects, in a structural equation model and path analysis, to further examine these variables in a regional system. The analyses are cross-sectional, and based on data for 331 US metropolitan regions for the year 2000.

The key findings confirm the general theory and hypotheses. The Bohemian-Gay Index has substantial effects on housing values across all permutations of the model and across all region sizes. It remains positive and significant alongside variables for regional income, wages, technology and human capital. In addition to its direct effect on housing values, the Bohemian-Gay Index also has a substantial direct effect on other key variables, particularly income, and because of that has an additional indirect effect in housing values as well. We thus reject the hypothesis that Bohemian-Gay Index only reflects higher incomes or higher human capital. The consistency of the findings clearly establishes that it works independently alongside those factors to condition housing values.

Concepts and Theory

The literature covering the determinants of housing values is vast. Housing prices, according to economic theory, are set at the intersection of supply and demand. Acting on the demand side are wages and income, while the availability of housing units conditions the supply side. Where new home building can occur relatively easily, supply increases to meet demand and prices stay more or less stable. Alternatively, when incomes rise in highly desirable areas or those with complex or constraining zoning, appreciation will be more rapid (Glaeser et al 2005, 2006).

Recent research has noted the rise of so-called "super-star cities" where appreciation far outpaces the national average (Gyourko et al 2006). This research charts the growing divergence in housing prices between the highest-priced city-regions compared to those near the median. It finds that this divergence is the result of limited land in specific metropolitan areas and the increase in high-income households overall, which increases demand for these limited locations where supply is constrained. Regional housing prices thus can and frequently do reflect a premium.

The literature has argued that there are several factors that affect this premium. Some act on the supply side, others acting on the demand side.

Alonso (1964), Mills (1967) and Muth (1969) developed seminal microeconomic models for housing prices and household location patterns based on bid rents and housing choice. Fujita (1989) later used a bid rent model to explain land use and city structure in terms of a gradient pattern - households located closest to the urban cener are likely to be small, reflecting their willingness to pay more to be close to the center and its amenities, while larger household are likely to locate further outside the core. Hedonic pricing theory also helps to explain the association between housing characteristics, (e.g. the size of the lot, the number of rooms, year of construction, and neighborhood qualities), and market value.

Roback (1982) expanded the traditional neoclassical model, where migration occurs in response to wage levels, economic opportunity, and land rent to include quality-of-life amenities An empirical study (Glaeser et al 2001) finds that high amenity cities have grown faster than low amenity cities. Consumer and personal service industries such as restaurants, theatres, and museums tend to be localized and thus demand geographic closeness between producer and consumer. This study finds that urban rents have risen faster than urban wages, and thus concludes that demand for location is driven by something other than the wage level - an urban amenity premium which translates into higher housing values. They introduce a simple formula for this: Urban Productivity Premium + Urban Amenity Premium = Urban Rent Premium.

Several other studies (Lloyd and Clark 2001; Clark et al, 2002, Clark 2003, Florida 2002a, b, c) document the role of amenities and lifestyle – in the form of entertainment, nightlife, culture, and so on – in attracting educated populations, who can pay more for housing. Florida (2002c) introduced a measure of observed locational preferences of the producers of artistic and cultural amenities, the "Bohemian Index," and found it to be associated with concentrations of human capital and innovation. Shapiro's (2006) detailed study of regional productivity growth found that "roughly 60 percent of the employment growth effect of college graduates is due to enhanced productivity growth, the rest being caused by growth in quality of life".

Shapiro's study finds that metropolitan areas with greater numbers of skilled workers experienced faster increases in wages, rental prices and housing prices.

Building upon (Glaeser et al 2001) and related studies as per above, we extend the concept of an urban amenity premium, arguing that bohemians and gays affect housing values on the supply side through an *aesthetic-amenity premium*. Artists and bohemians are direct producers of amenities; their location will thus directly reflect higher levels of amenity. Furthermore, the location decisions of artists and gays also reflect community amenities. As selective buyers with an eye for amenity, authenticity and aesthetics, locations where artists, bohemians and gays concentrate will command a premium price for their cultural amenities, desirable neighborhood character, and aesthetic quality of the housing stock. Thus following Glaeser et al (2001), we argue that: Regional Income + Regional Amenity Premium = Regional Housing Value.

Second, other studies find that industrial structure affects housing values, by acting on the demand side. A recent study explores the role of regional industry structure, focusing especially the role of high-tech, "new economy" sectors on housing values (Landis et al 2002). The research finds that new economy regions, such as Silicon Valley, Washington DC, and Manhattan experienced surging home prices in the 1990s. It also finds that homeownership rates were lower and crowding was greater in these markets; even though wages were rising, home ownership was harder to attain. We test directly for the effects of high-technology industry concentration on housing prices.

A third factor relates to demographic shifts. There is a long literature on neighborhood transition and its effects on housing values. More recent research notes the inter-regional migration and concentration of highly skilled and education populations. Building the seminal insights of Jacobs' (1961, 1968) on cities, Lucas (1988) argues that the clustering of human capital or what he refers to as human capital externalities is the basic mechanism of economic growth. Central locations localize human capital and information, create knowledge spillovers, and become engines of economic growth. In doing so, they reduce the cost of knowledge transfer, so ideas move more quickly, in turn giving rise to new knowledge more quickly and

spur economic growth. Research has empirically verified the role of human capital in regional growth (Rauch 1993; Simon and Nardinelli 1996; Simon (1998). It would be expected then that such human capital concentration would lead to increased demand for housing and thus increased prices. Glaeser (2000) finds that firms follow human capital to some degree, locating in areas of high human capital concentration to gain competitive advantages, rather than letting suppliers' and customers' geography alone dictate their location.

Recent research finds that human capital is becoming more concentrated (Florida 2002b; Berry and Glaeser 2005), which acts on housing values by increasing demand in local markets. Berry and Glaeser (2005) investigation into the divergence of human capital levels across cities finds that the dispersion of human capital has gone from relatively evenly dispersed among US metropolitan areas to increasingly divergent. Glaeser and Saiz (2003) indicate that skilled cities grow, relative to less skilled cities, through increases in productivity. There are reasons to believe that such divergence will continue, affecting not only regional growth levels, but also housing values (Shapiro 2005; Gyourko et al 2006). We test directly for human capital effects by including variables for both human capital and the creative class in our model.

The fourth factor involves the role of artistic, bohemians and gay populations on housing values. It has become a conventional wisdom to think of artists, designers, and gay people as "urban pioneers" who drive up real estate values in the neighborhoods where they are attracted. There is a substantial, mainly descriptive literature on gentrification (Castells 1983; Ley 1994; Zukin 1995; Smith 1996). These studies which are mainly historical and case study in nature cite the role of artists and gay populations in improving neighborhood conditions leading to an increase in real estate values and housing prices.

A recent stream of research examines the effects of artistic and gay populations on regional development (Florida, 2002a, 2005; Florida and Gates 2001). Markusen and Schrock (2006) describe an "artistic dividend" through which arts and cultural activities increase the vibrancy and diversity life in metropolitan areas and influence other industries. Their investigation into the multiple industries across which artists work is congruent with Glaeser's and others findings regarding the

effects of knowledge spillovers on urban innovation and productivity. This basic idea is that artistic and culturally creative individuals can act as conduit for knowledge transfer across firms and industries, creating a multiplier effect of sorts. Currid (2006, 2007) describes the role of creative industries and occupations as a driving factor in the development of New York City, finding that networks of artistic and creative individuals are key conduits for such spillovers that result in new ideas, commercial innovation, and income growth.

Florida (2002c) introduced a measure of the producers of artistic and cultural amenities - the "Bohemian Index"- and found it to be associated with concentrations of talent and innovation. Noland (2005) found that tolerant attitudes toward gay and lesbians are associated with both positive attitudes toward global economic activity and international financial outcomes. Florida and Gates (2001) found a positive association between concentrations of gay households and regional development. For these reasons, we can expect that artistic and gay populations will affect housing values through their association with broader demographic shifts, especially human capital concentration, and also through their direct effects on innovation and regional development.

Here, we argue that bohemian, artistic and gay populations reflect a second premium – a *tolerance* or *open culture premium.* This tolerance or open culture premium acts on the demand side by making local resources more productive and efficient operating through four key mechanisms. First, locations of bohemian and gay populations reflect low barriers to entry for human capital. Such locations will have advantages in attracting a broad range of talent across racial, ethnic and other lines, increasing the efficiency of human capital accumulation. Page (2007) provides additional theory and evidence that such diversity is associated with higher rates of innovation and economic growth.

Second, larger bohemian and gay populations signal underlying mechanisms that increase the efficiency of knowledge spillovers and human capital externalities that Lucas (1988) identifies as the primary engine of economic growth. Recent studies (Markusen and Schrock 2006; Currid 2006, 2007) note the role of artistic networks as conduits for the spread of new ideas and knowledge transfer across firms and

industries. Greater concentrations of artists and gays thus reflect regional mechanisms that accelerate human capital externalities and knowledge spillovers.

Third, artistic and gay populations reflect regional values that are open-minded, meritocratic, tolerant of risk, and oriented to self-expression. Inglehart et al (2003, 2005) has noted the correlation between self-expression values and GDP growth at the national level, while psychological studies (Amabile, 1996, Stenberg, 1999, Fredrickson, 2001) have found that self-expression is positively associated with innovative and entrepreneurial activity. Lucas (1988) explicitly highlights the similarities in values and orientation as "creative" actors between technological and entrepreneurial labor and artistic and cultural populations, noting that: *"*Much of life is "creative" in much the same way that is "art" and "science."…To an outsider it even looks the same. A collection of people doing pretty much the same thing, each emphasizing his own originality and uniqueness."

Fourth, locations with larger artistic and gay populations signal underlying mechanisms which increase the productivity of entrepreneurial activity. Because of their status as historically marginalized groups, traditional economic institutions have been less open and receptive to bohemian and gay populations thus requiring them to mobilize resources independently and to form new organizations and firms. We thus suggest that regions where these groups have migrated and taken root reflect underlying mechanisms which are more attuned to mobilization of such resources, entrepreneurship and new firm formation. These four factors, when taken together, improve the efficiency and productivity of regional human capital, innovation and entrepreneurship, increasing local income and wealth and acting through those channels to increase housing prices.

Taking these two classes of factors together, our argument can be summarized in a simple equation: Regional Income + Regional Amenity Premium + Regional Openness Premium = Regional Housing Value. To examine this, we introduce a combined measure of bohemian and gay populations – the Bohemian-Gay Index and enter it into our theory and model alongside income, human capital, technology, and other factors that are said to affect housing values.

Model

A schematic picture of our general model of regional housing values is outlined in Fig.1. The model considers housing prices in terms of a system of relationships. It thus allows us to test the direct and indirect effects of variables for income, human capital, technology, and openness-amenity (the Bohemian-Gay Index) on one another and on housing prices. The arrows identify the hypothesized structure of relationships among the key variables. A schematic outline of the general model is provided in Fig.1.

(Figure 1 about here)

Variables and Data

We now describe the variables and data sources used in the empirical model. The variables cover 331 geographical units, and are for the year 2000. Descriptive statistics for all measures and variables are provided in Table 1.

(Table 1 about here)

Median Housing Value: This variable is the MSA median housing value. In other words, if the MSA is contained in one state, it is equal to the median. But, if the MSA crosses state borders, it is based on separate medians for each state in the MSA and calculated to a weighted average of the medians using the number of owner occupied houses valued. This is for year 2000 from Census.

Income: This measure is based on reported income. Income is defined as proceeds from wages and salaries plus self-employment income; interest, dividends, rents, royalties, estates, trusts; social security or railroad retirement income, Supplemental Security Income (SSI), public assistance, welfare payments, retirement, survivor, or disability pensions, and all other income . It is measured on a per capita basis and is from the 2000 US Census.

Wages: This measure is the sum of the wages and salaries. It is defined as total money earnings received for work performed as an employee in the region. This measure includes wages, salary, armed forces pay, commissions, tips, piece-rate payments, and

cash bonuses earned before taxes. It is measured on a per capita basis and is from the 2000 US BLS.

Technology: The technology variable is based on the Tech-Pole Index from 2000 published by the Milken Institute. This index ranks metropolitan areas based on: (1) high-tech industrial output as a percentage of total US high-tech industrial output; and (2) the percentage of the region's own total economic output that comes from high-tech industries compared to the nationwide percentage.

Human Capital: This variable is the conventional measure based on educational attainment, measured as the percentage of the regional labor force with a bachelor's degree and above. It is from the 2000 US Census.

Creative Class: Following Florida (2002a), we define the creative occupations or the "creative class," defined as those in which individuals "engage in complex problem solving that involves a great deal of independent judgment and requires high levels of education or human capital." Specifically, it includes the following major occupational groups: computer and math occupations; architecture and engineering; life, physical, and social science; education, training, and library positions; arts and design work; and entertainment, sports, and media occupations. – as well as other professional and knowledge work occupations such as including management occupations, business and financial operations, legal positions, healthcare practitioners, technical occupations, and high-end sales and sales management. It is measured as share of the regional labor force aged 25-64. All data is from the US Bureau of Labor Statistics for the year 2000.

Bohemian-Gay Index: This variable is based on the over- and under-representation of two groups; (1) gay and lesbian households and (2) individuals employed in the arts, design and related occupations (see Florida et al (2001, 2002a, b, c, 2005). It combines the separate location quotients for these two groups into the Bohemian-Gay Index. The data are from the US Census for the year 2000

Methods

We use path analysis and structural equations to examine the relationships between variables in the model. In order to analyze the dynamics between this set of variables, structural equation modeling is used. Structural equation models (SEM) may be thought of as an extension of regression analysis and factor analysis, expressing the interrelationship between variables through a set of linear relationships, based upon their variances and co-variances. In other words, structural equation replaces a (usually large) set of observable variables with a small set of unobservable factor constructs, thus minimizing the problem of multi-collinearity (further technical description in Jöreskog, 1973). The parameters of the equations are estimated by the maximum likelihood method.

It is important to stress that the graphic picture of the structural model (Fig.1) expresses direct and indirect correlations, not actual causalities. Rather, the estimated parameters (path coefficients) provide information of the relation between the set of variables. Moreover, the relative importance of the parameters is expressed by the standardized path coefficients, which allow for interpretation of the direct as well as the indirect effects.

From the relationships depicted in the model (Fig.1) we estimate three equations:

$$lnTalent = \beta_{11} lnBohemianGay + e_1 \quad (1)$$

$$lnIncome = \beta_{21} lnBohemianGay + \beta_{22} lnTalent + e_2 \quad (2)$$

$$lnHousing = \beta_{31} lnBohemianGay + \beta_{33} lnIncome + e_3 \quad (3)$$

We also ran a revised version of path models (Fig 2), letting the talent variables – human capital and the creative class – have a direct as well as an indirect effect on housing.

(Figure 2 about here)

Findings

We begin by providing simple correlation coefficients between housing values and key measures for income, human capital, the creative class, and the Bohemian-Gay Index. We then present the findings of OLS models. A following section summarizes the key findings from structural equation models and path analysis.

Table 2 provides a correlation matrix for all key variables. The highest correlation is not surprisingly between income and housing (0.747). But the correlation coefficient for the Bohemian-Gay Index and housing is only slightly less, 0.731. It is also considerably larger than that for wages and housing (0.494). Looking at the various talent measures, the coefficient between human capital and housing (0.643) is about the same as for Bohemian-Gay Index, while the coefficients for the creative class (0.291) is about half that for the Bohemian-Gay Index. Furthermore, the Bohemian-Gay Index is also closely correlated with income (0.648), human capital (0.737), the creative class (0.470) and technology (0.601).

(Table 2 about here)

Fig 2 provides continues this line of analysis, providing scatter-graphs for housing and income, wages, human capital, and the Bohemian-Gay Index. Not surprisingly, the slope is steepest for the scatter-graph of income and housing, with few outliers and observations clustered close to the line. But the line for the Bohemian-Gay Index is very similar. The slope is steep with observations clustered close to the line and outliers pulling slightly away to the left.

(Figure 3 about here)

OLS Results

We ran OLS regressions to further probe the effects of income, human capital, and the Bohemian-Gay Index on housing values. Table 3 presents the results for income and wage regressions.

The Bohemian-Gay Index is significant when used in combination with wages, income and both. The adjusted R2s for the equations that include it are significantly higher than the ones where it is not included. Adding the Bohemian-Gay Index to the income equation increases the adjusted R2 from 0.556 (Eq 2) to 0.611 (Eq 5). Adding it to the wage model, increases the adjusted R2 from 0.242 (Eq 1) to 0.542 (Eq 4). When the Bohemian-Gay Index is included in the final version of the model (Eq 6) alongside both income and wages, the adjusted R2 increases to 0.675 and the coefficient remains positive and significant. Furthermore, the Beta coefficients for the Bohemian-Gay Index and income are similar, and the t values are as well. While some might argue that artistic and gay populations are a reflection of higher incomes, the Bohemian-Gay Index remains positive and significant alongside the income variable and adds additional explanatory power to it. Also, when we test for the multi-collinearity between income and the Bohemian-Gay Index in Equation 5 the VIF value is 1.724, which leads us to conclude that they do not contain the same information. Consequently we are led to conclude that the Bohemian-Gay Index is not a reflection of higher incomes, but works independently alongside it on housing values.

(Table 3 about here)

Table 4 presents the results for the human capital regressions. Here again the Bohemian-Gay Index performs well, adding considerable explanatory power. Adding the Bohemian-Gay Index to the human capital equation (Eq 4) increases the adjusted R2 from 0.412 (Eq 1) to 0.555 (Eq 4), and its coefficient is positive and significant. Adding it to the creative class model, increases the adjusted R2 from 0.082 (Eq 1) to 0.527 (Eq 5). Here, the Bohemian-Gay Index provides virtually all the explanatory power. When the Bohemian-Gay Index is included in the final version of the model (Eq 6) alongside both human capital and the creative class the adjusted R2 increases to 0.582, and the coefficient remains positive and significant. Clearly the findings here indicate that the Bohemian-Gay Index operates independently, and in combination, with human capital to condition housing values. We also run a multi-collinearity test including both human capital and the Bohemian-Gay index (Eq 4) which resulted in a VIF of 2.189 - an acceptable level.

(Table 4 about here)

Findings from Structural Equation Models and Path Analysis

We now turn the results from the structural equation models and path analysis. These models include variables for income, wages and technology; human capital and the creative class; and the Bohemian-Gay Index. These models allow us to isolate the effects of each of these variables on each other and on housing variables in a system of relationships.

Table 5 summarizes the SEM results. The Bohemian-Gay Index is consistently strong, both in its direct effects on housing and in its indirect effects working through income and wages regardless of which measure of human capital is used.

(Table 5 about here)

Fig. 4 presents the results for the first set of path models. These test the relationships among variables for housing, income, human capital and the Bohemian-Gay Index.

The Bohemian-Gay Index performed well in all versions of this model, with coefficients between it and housing (0.43), similar to that between housing and income (0.47). However, the Bohemian-Gay Index has an additional effect on human capital (0.74) and income (0.29), giving it an additional indirect effect on housing via income. We also ran a revised of this model where we let the human capital and creative class variables have direct effects on housing as well as on income. The Bohemian-Gay Index again performed well in these models, while the coefficients between housing and human capital and the creative class were small, negative or insignificant. These findings further confirm the importance of the Bohemian-Gay Index in acting directly on housing values and indirectly through its effects on both human capital and income.

(Figure 4 about here)

The next series of path models substitute wages for income (see Fig. 5). Wages are a core measure of regional productivity and account for roughly 70 percent of income (see Florida, Mellander, Stolarick 2007). Fig 5 provides the results for these paths.

The Bohemian-Gay Index performed even better in these models. The coefficients between it and housing were consistently the highest (0.66), outperforming the wage effect on housing (0.13). The Bohemian-Gay Index also has a significant effect on human capital (0.74) and income (0.17), having an additional indirect on housing through its effects on income. We ran model in a revised version, letting human capital and the creative class variables have a direct effect on housing. Other than the Bohemian-Gay Index, only the coefficient for human capital was positive and significant (0.20), considerably smaller than for the Bohemian-Gay Index (0.44).

(Figure 5 about here)

We ran a third version of the paths substituting an aspect of industrial structure – high technology industry – for income. Recall the Landis et al (2002) find that new economy industry concentration affects housing prices. Fig. 6 presents the results for this set of models.

The Bohemian-Gay Index again performed well. The coefficient between it and housing is 0.63, quite a bit larger than the coefficient of 0.16 between technology and housing. The Bohemian-Gay Index also has a significant effect on human capital (0.74) and technology (0.41), meaning it also indirectly effect on housing values through its effect on technology. We also ran the revised version of the basic path model letting the talent variables have a direct effect on housing. Other then the Bohemian-Gay Index, only human capital had an effect - the coefficient between it and housing is 0.20 - compared to 0.55 for the Bohemian-Gay Index.

(Figure 6 about here)

Region Size Effects

It might be argued that the effects of the Bohemian-Gay Index vary by size of region, with large regions having an advantage in attracting gays and bohemians or in the latter case providing the resources which produce them. To look more closely at the effects of region size, we ran the basic SEM model for four regional size groupings: regions over 1 million population, between 500,000 and 1 million; between 250,000 and 500,000; and less than 250,000. Table 6 summarizes the results.

Here again the findings confirm the role of the Bohemian-Gay Index. The coefficients for it and housing are positive and significant across all regional size groups, no matter if it is combined with income, wage or technology. The Bohemian-Gay Index is positive and significant in all but one of the models where it is combined with human capital and the creative class – the model with the creative class in medium sized regions.

We also note that income has a substantial effect on housing values. Income explains more of housing values than wages across all region sizes. Wages are significant only in the largest regions. Technology is significantly related to housing in the largest and smallest regions but not in between.

While income is slightly more important on housing directly, the Bohemian-Gay Index affects all three variables – housing values, incomes and human capital. Indeed, the Bohemian-Gay Index has a significant direct effect on income across all size groups.

These findings confirm the role of the Bohemian-Gay Index. It has a sizeable effect on housing values regardless of region size as well as what other variables are included in the models. In addition to its direct effect on housing values, it also has a significant direct effect on other important key variables, including the most powerful one, income, and operates through it to have an additional effect on housing. For these reasons, we can conclude that the results for this variable are not being produced by higher incomes or higher human capital, but that it works independently alongside as well as through those variables to condition housing values.

(Table 6 about here)

Conclusions

This paper has examined the effects of artistic, bohemian and gay populations on housing values across US metropolitan regions. It is now a conventional wisdom to say gay and bohemian populations increase housing values. But these groups are small, and the evidence of their effect comes from descriptive studies of s small number of urban boutique neighborhoods. We advanced a novel theory for the effects of bohemian and gay populations on housing values.

We argued that artistic and gay populations effect housing values through two classes of mechanisms: an *aesthetic or amenity premium* which acts on the supply side as per Glaeser et al (2001) and a *tolerance* or *open culture premium* which acts on the demand side by reducing barriers to entry for human capital; increasing the efficiencies of human capital externalities and knowledge spillovers; promoting self-expression and new idea generation; and facilitating entrepreneurial mobilization of resources, thus acting on regional income and real estate prices.

We represented our theory in a simple equation: Regional Income + Regional Amenity Premium + Regional Openness Premium = Regional Housing Values. To probe for this, we introduced a combined measure of bohemian and gay populations – the Bohemian-Gay Index. We conducted a variety of statistical analysis to test the efficacy and performance of this measure against other variables that are expected to affect housing values: income, wages, technology, and human capital.

The key findings confirm the general theory and hypotheses. The Bohemian-Gay Index has substantial effects on housing values across all permutations of the model, regardless of what other variables and included and across all region sizes. It remains positive and significant alongside variables for regional income, wages, technology and human capital. In addition to its direct effect on housing values, the Bohemian-Gay Index also has a substantial direct effect on other key variables, particularly income, and because of that has an additional indirect effect on housing values as well. The findings clearly indicate that its effects operate independently of

those factors as well as in combination with them to affect housing values. Our results convince us that the regional concentration of artists, gays and bohemians really does matter especially for housing prices - the best indicator we can think of for the effective demand for location – even if it does so in different ways than most people think.

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Figures:

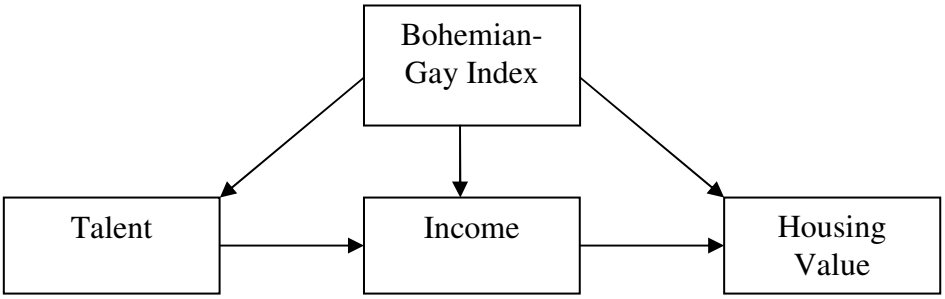


Fig. 1: Basic Path Model

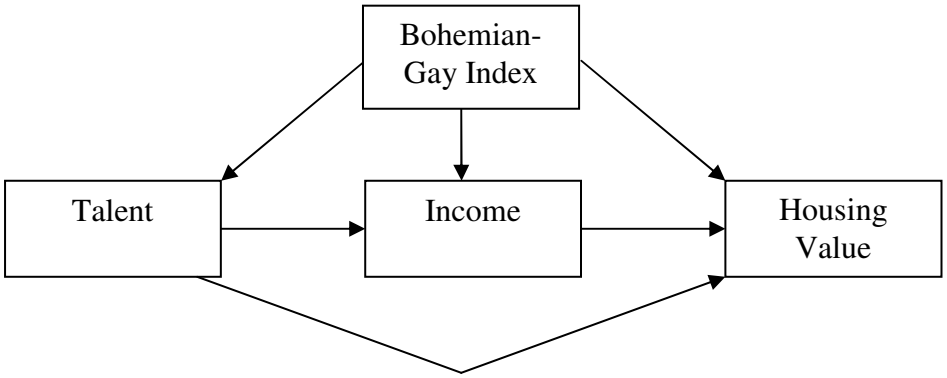


Fig. 2: Revised Path Model

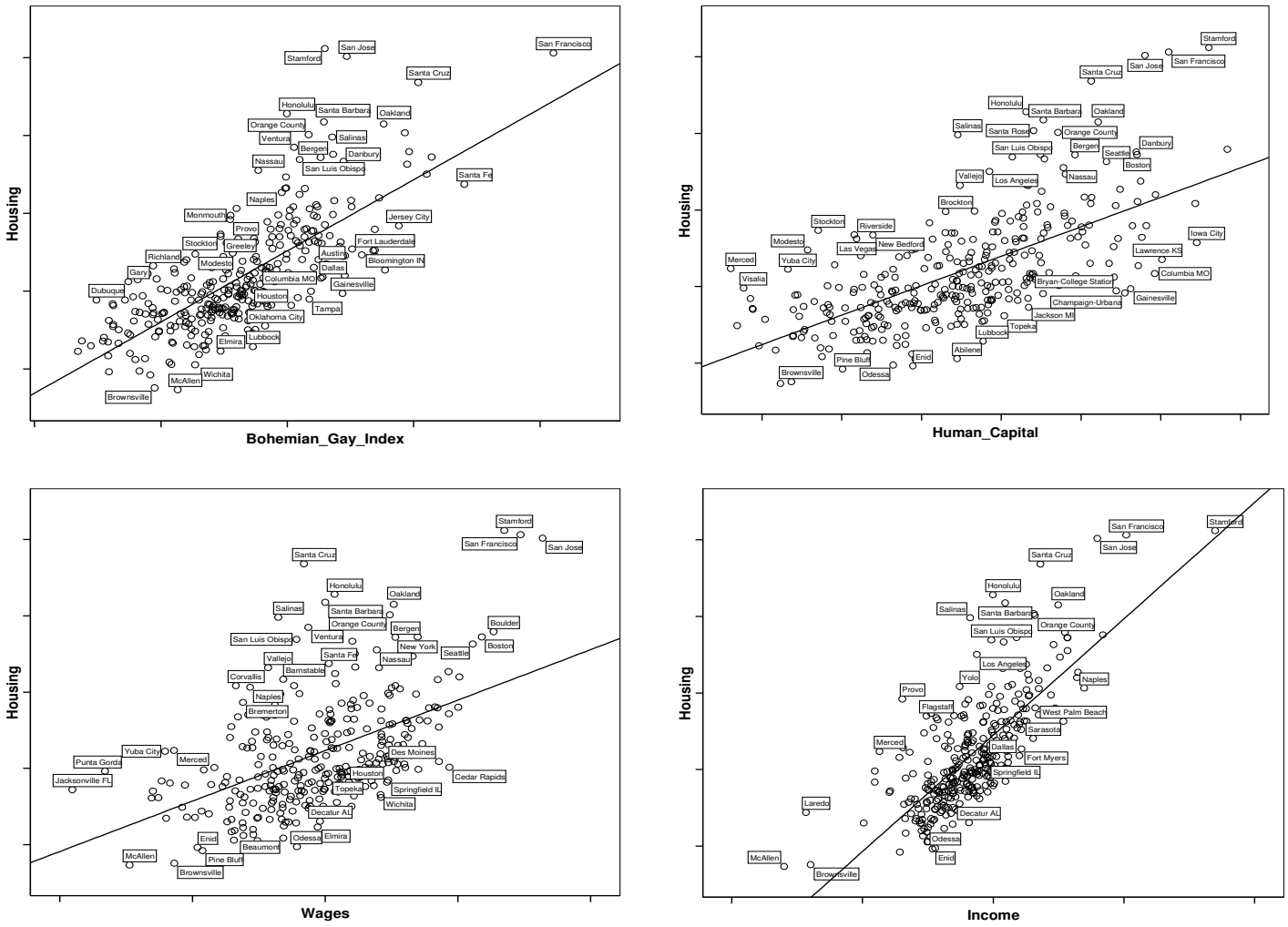
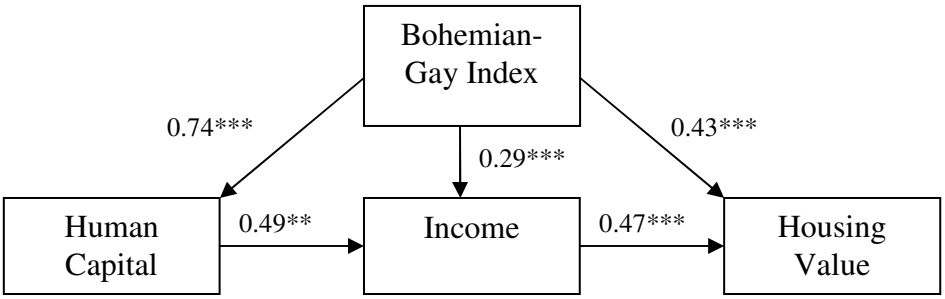


Fig 3: Scatter-graphs

Human capital



Creative Class

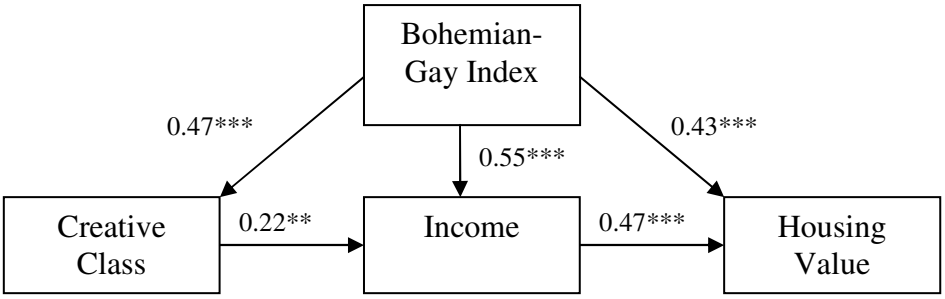
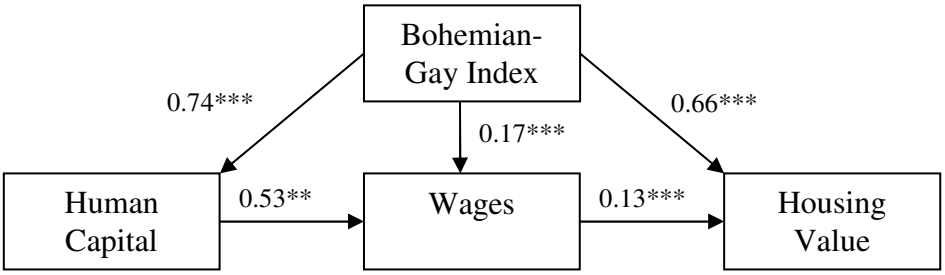


Fig. 4: Path models for housing, income and the Bohemian-Gay Index

Human capital



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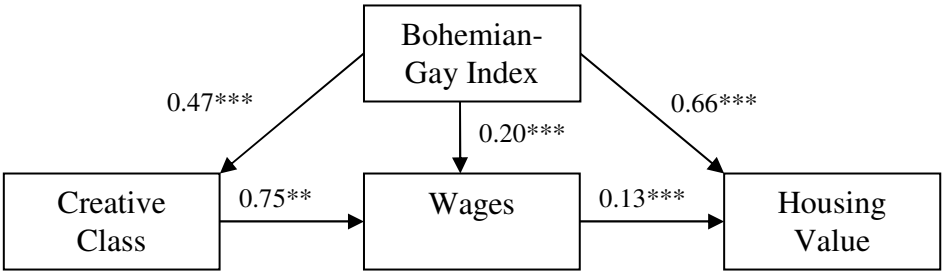
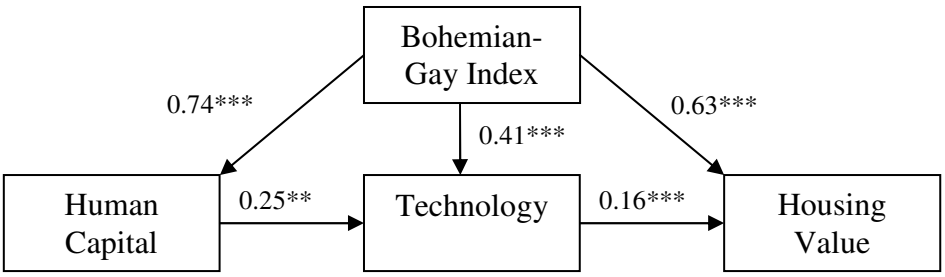


Fig. 5: Path models for housing, wages and the Bohemian-Gay Index

Human capital



Creative Class

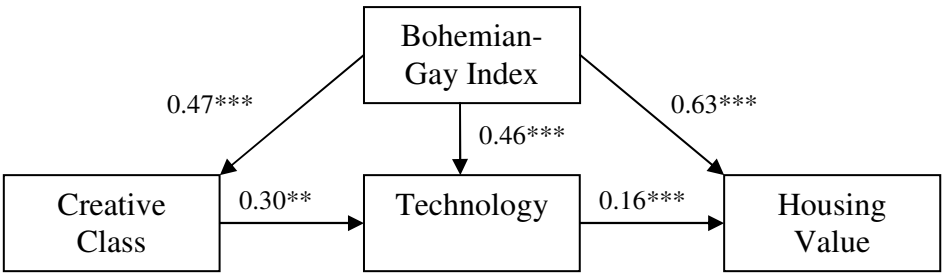


Fig. 6: Path models for housing, technology and the Bohemian-Gay Index

Tables:

Table 1: Descriptive Statistics

	Obs	*Mean*	*Standard Deviation*	*Minimum*	*Maximum*
Human Capital	326	23.72	7.43	11.05	52.38
Creative Class	299	20.30	5.88	8.55	42.73
Bohemian-Gay Index	326	0.876	0.281	0.44	2.87
Technology	328	0.701	2.253	0.00	29.96
Wages	331	13.428	3.700	5.153	30.311
Income	326	20.607	3.972	9.899	51.462
Housing	326	117.524	56.570	52.400	469.500

Table 2: Correlation Matrix for Key Variables

	Human Capital	**Creative Class**	**Bohemian-Gay Index**	**Technology**	**Wages**	**Income**	**Housing**
Human Capital	1						
Creative Class	.727(**)	1					
Bohemian-Gay	.737(**)	.470(**)	1				
Technology	.558(**)	.516(**)	.601(**)	1			
Wages	.653(**)	.840(**)	.557(**)	.610(**)	1		
Income	.701(**)	.474(**)	.648(**)	.578(**)	.723(**)	1	
Housing	.643(**)	.291(**)	.731(**)	.544(**)	.494(**)	.747(**)	1

** Correlation is significant at the 0.01 level (2-tailed).

Table 3: Regression results for income and wages

Variable	Eq 1	Eq 2	Eq 3	Eq 4	Eq 5	Eq 6
Wages	0.661***		-0.130*	0.168***		-0.243***
	(10.226)		(-1.816)	(2.777)		(-3.901)
Income		1.519***	1.662***		0.958***	1.188***
		(20.206)	(15.315)		(11.095)	(11.528)
Bohemian-Gay Index				0.827***	0.533***	0.568***
				(14.627)	(10.044)	(10.773)
Obs	326	326	326	326	326	326
R2 Adj	0.242	0.556	0.559	0.542	0.661	0.675

Table 4: Regression results for human capital and the creative class

Variable	Eq 1	Eq 2	Eq 3	Eq 4	Eq 5	Eq 6
Human Capital	0.769***		1.098*	0.273***		0.557***
	(15.118)		(14.316)	(4.177)		(6.333)
Creative Class		0.382***	-0.470***		-0.065	-0.377***
		(5.239)	(-5.744)		(-1.434)	(-5.213)
Bohemian-Gay Index				0.704***	0.956***	0.669***
				(10.281)	(16.760)	(9.535)
Obs	326	299	326	326	299	299
R2 Adj	0.412	0.082	0.459	0.555	0.527	0.582

Table 5: Overall SEM results

Wages	**Human Capital**			**Creative Class**		
	Human Capital	***Wages***	***Housing***	***Creative Class***	***Wages***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay	0.771***	0.155***	0.827***	0.470***	0.187***	0.827***
Talent		0.474***			0.710***	
Wages			0.168***			0.168***
Observations	331	331	331	331	331	331
R2	0.543	0.439	0.545	0.224	0.751	0.545
Income	**Human Capital**			**Creative Class**		
	Human Capital	***Income***	***Housing***	***Creative Class***	***Income***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay	0.771***	0.177***	0.533***	0.455***	0.335***	0.533***
Talent		0.287***			0.139***	
Income			0.958***			0.958***
Observations	331	331	331	331	331	331
R2	0.543	0.529	0.663	0.221	0.457	0.663
Technology	**Human Capital**			**Creative Class**		
	Human Capital	***Technology***	***Housing***	***Creative Class***	***Technology***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay	0.771***	3.372***	0.790***	0.457***	4.110***	0.791***
Talent		2.178***			2.823***	
Technology			0.023**			0.023***
Observations	331	331	331	331	331	331
R2	0.543	0.391	0.552	0.222	0.434	0.552

Table 6: SEM results by region size

Over 1 million population						
	Human Capital			**Creative Class**		
	Talent	***Income***	***Housing***	***Talent***	***Income***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay	0.455***	0.023	0.644***	0.350***	0.207***	0.644***
Talent		0.596***			0.249***	
Income			1.489***			1.489***
Observations	61	61	61	61	61	61
R2	0.265	0.705	0.687	0.132	0.331	0.687
R2	0.265	0.623	0.511	0.132	0.774	0.511
500,000 to 1 million population						
	Human Capital			**Creative Class**		
	Talent	***Income***	***Housing***	***Talent***	***Income***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay	0.705***	-0.074	0.518***	0.117	0.325***	0.518***
Talent		0.613***			0.281***	
Income			0.876***			0.876***
Observations	42	42	42	42	42	42
R2	0.390	0.611	0.481	0.013	0.309	0.481
250,000 – 500,000 population						
	Human Capital			**Creative Class**		
	Talent	***Income***	***Housing***	***Talent***	***Income***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay	0.992***	0.170	0.914***	0.580***	0.515***	0.914***
Talent		0.370***			0.037	
Income			0.836***			0.836***
Observations	79	79	79	79	79	79
R2	0.614	0.531	0.716	0.193	0.413	0.716
Less than 250,000 population						
	Human Capital			**Creative Class**		
	Talent	***Income***	***Housing***	***Talent***	***Income***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay	0.835***	0.165***	0.469***	0.380***	0.240***	0.469***
Talent		0.139***			0.107***	
Income			0.711***			0.711***
Observations	144	144	144	144	144	144
R2	0.531	0.400	0.565	0.159	0.386	0.565

Appendix

Table 1: SEM results for wages and technology by region size

More than 1 million population						
Human Capital						
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Variables	***Talent***	***Wages***	***Housing***	***Talent***	***Technology***	***Housing***
Bohemian-Gay	0.455***	0.060	0.833***	0.455***	0.929	0.861***
Talent		0.738***			4.777***	
Wages/Technology			0.629***			0.071***
Observations	61	61	61	61	61	61
R2	0.265	0.623	0.511	0.265	0.438	0.504
Creative Class						
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Variables	***Talent***	***Wages***	***Housing***	***Talent***	***Technology***	***Housing***
Bohemian—Gay Index	0.350***	0.141**	0.833***	0.350***	2.113**	0.861***
Talent		0.727***			2.823***	
Income/Wages/Technology			0.629***			0.071***
Observations	61	61	61	61	61	61
	0.132	0.774	0.511	0.132	0.309	0.504
500,000 to 1 million population						
Human Capital						
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Variables	***Talent***	***Wages***	***Housing***	***Talent***	***Technology***	***Housing***
Bohemian-Gay Index	0.705***	-0.323**	0.795***	0.705***	-0.138	0.784***
Talent		0.847***			4.313***	
Wages/Technology			0.132			0.016
Observations	42	42	42	61	61	61
R2	0.390	0.595	0.304	0.390	0.385	0.303
Creative Class						
	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Variables	***Talent***	***Wages***	***Housing***	***Talent***	***Technology***	***Housing***
Bohemian-Gay Index	0.132	0.171*	0.795***	0.150	2.368**	0.784***
Talent		0.783***			3.558***	
Wages/Technology			0.132			0.016
Observations	42	42	42	42	42	42
R2	0.016	0.679	0.304	0.021	0.371	0.303
250,000 – 500,000 population						
Human Capital						
	Talent	***Wages***	***Housing***	***Talent***	***Technology***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay Index	0.992***	0.011	1.349***	0.992***	1.227	1.283***
Talent		0.620***			3.309***	
Wages/Technology			0.022			0.018
Observations	79	79	79	79	79	79
R2	0.614	0.499	0.620	0.614	0.369	0.625
Creative Class						
	Talent	***Wages***	***Housing***	***Talent***	***Technology***	***Housing***

Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay Index	0.584***	0.266***	1.349***	0.580***	2.962***	1.283***
Talent		0.617***			2.666***	
Wages/Technology			0.022			0.018
Observations	79	79	79	79	79	79
R2	0.196	0.733	0.620	0.194	0.412	0.625
Less than 250,000 population						
Human Capital						
	Talent	***Wages***	***Housing***	***Talent***	***Technology***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay Index	0.835***	0.025	0.658***	0.835***	2.451****	0.615***
Talent		0.341***			1.123	
Wages/Technology			0.034			0.016**
Observations	144	144	144	144	144	144
R2	0.531	0.238	0.485	0.531	0.183	0.499
Creative Class						
	Talent	***Wages***	***Housing***	***Talent***	***Technology***	***Housing***
Variables	Eq 1	Eq 2	Eq 3	Eq 1	Eq 2	Eq 3
Bohemian-Gay Index	0.388***	0.046	0.658***	0.379***	2.823***	0.616***
Talent		0.682***			1.449*	
Wages/Technology			0.034			0.016**
Observations	144	144	144	144	144	144
R2	0.154	0.684	0.485	0.158	0.194	0.499