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Love thy neighbor: Income distribution and housing preferences

Tin Cheuk Leung [a,*], Kwok Ping Tsang [b]

[a] Department of Economics, Chinese University of Hong Kong, Room 914, Esther Lee Building, Chung Chi Campus, Shatin, Hong Kong
[b] Department of Economics, Virginia Tech, Pamplin Hall (0316), Blacksburg, VA 24061, United States

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ABSTRACT

Do homeowners prefer living in an area with a more equal distribution of income? We answer this question by estimating a semi-parametric hedonic pricing model for about 90,000 housing units transacted in Hong Kong between 2005 and 2006. We first identify a hedonic price function by locally regressing the rental price of the housing unit on its intrinsic and neighborhood characteristics, one of which is the Gini coefficient for household income of the constituency area. We then combine the estimates with a log utility function to obtain the heterogeneous preference parameters. Finally, we estimate the joint distribution of the preference parameters and demographics. We find that most homeowners have a strong distaste for inequality in their neighborhood, and the distaste increases with income and goes down with education level. Counterfactual experiments show that reallocating public rental housing by half can increase the welfare of homeowners by about HK$8,000 on average per year, an amount which is equivalent to increasing the housing unit by 20 square feet or reducing the age of the unit by 5 years.

1. Introduction

"How seldom we weigh our neighbor in the same balance with ourselves"

Of the Imitation of Christ, Thomas à Kempis (1418).

Do homeowners have a preference for living among neighbors with a similar income level? Common sense suggests that homeowners prefer income equality in the neighborhood. There is the alleged snobbery of the rich towards the poor and the reciprocal jealousy of the poor towards the rich. Recent neural science research has also shown that humans have social preferences to reduce inequality in outcome distributions (see Tricomi et al., 2010). According to one sociological research by Gans (1961), "People with higher incomes and more education may feel that they or their children are being harmed by living among less advantaged neighbors. The latter are likely to feel equally negative about the 'airs' being put on by the former. . .". In this paper we give a quantitative answer to the question by studying approximately 90,000 transactions in the Hong Kong housing market in 2005 and 2006.

There is a concern that we may be mixing up the distaste for inequality with other unpleasant outcomes induced by inequality. For example, the poor may find it hard to find a shop that caters for his needs in a rich neighborhood; also, the rich may be concerned about the higher crime rate in a poor neighborhood. Our identifying assumption is that these unpleasant outcomes are likely to affect a *district* larger than a *local neighborhood* (the size of both will be defined later). We are then able to control for district fixed effects in order to identify the distaste for inequality in a local neighborhood.

We first describe the data and explain why two unique features of the Hong Kong housing market are important for our purpose. First, Hong Kong is a densely populated

* Corresponding author.
E-mail addresses: tleung@cuhk.edu.hk (T.C. Leung), byront@vt.edu (K.P. Tsang).

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area that magnifies the impact of neighbors (e.g., frequent face-to-face interactions in the elevator). Second, the public housing policy in Hong Kong has created substantial income inequality within local neighborhoods. Using a 3-step semi-parametric hedonic pricing technique, we obtain the willingness to pay and preference parameters for the characteristics of the housing unit and also the neighborhood characteristics. In particular, we look at the preference for income inequality and see how the preference changes with the demographics. Finally, we conduct a counterfactual experiment by reallocating half of the poorest public housing residents in all constituency areas in Hong Kong, and look at the welfare implications.

To address the concern that the neighborhood income inequality may be correlated with some omitted variable that are correlated with house price, we take advantage of an exogenous policy change. On May 15, 2004, the Hong Kong SAR government made an unexpected announcement to turn a hitherto idle apartment complex into public rental housing. The expectation of an influx of relatively poor neighbors caused a drop in the housing transaction prices in that neighborhood. We compare the housing prices in this neighborhood and several control groups and find that the effect of income inequality induced by this policy change is in line with the estimates in our semi-parametric hedonic regression.

Our paper is related to the large literature of the neighborhood effects on house price, and our paper contributes to the literature by identifying a new neighborhood effect, i.e., income inequality in the local neighborhood. Empirical studies on the neighborhood effect can be roughly divided into several categories. First, Boyle and Kiel (2001) review the evidence on the impact of environmental goods, such as air quality, on consumers' willingness to pay for housing. A recent paper by Rossi-Hansberg et al. (2010) looks at the concentrated residential urban revitalization programs in Richmond, VA. A few disadvantaged neighborhoods (the impact area) are supported by the federal government to renovate, but the neighborhood of the impact area also benefits from the program due to the neighborhood effects. The authors find that there is an increase in the land value of the neighborhood, and the effect decreases with the distance from the impact area. Using the American Housing Survey for 1985 and 1989, Ioannides (2002) finds that whether the neighbors (the 10 nearest housing units) of an individual have house maintenance substantially affects the individual's maintenance decision. That is, living in a dilapidated neighborhood discourages an individual to improve her housing unit, while the individual has a higher incentive to renovate when the neighbors' housing units look much better. There are studies on the impact of school quality on house price. For example, Bayer et al. (2007) find that households are willing to pay less than 1% more in house price when the average performance of the local schools is higher by 5%. Social status of the neighbors also matters. Ioannides and Zabel (2003) find a large elasticity of housing demand with respect to neighbors' permanent income. Our paper is closest to a recent study by Ioannides et al. (2008). The authors find that homeowners prefer to live with neighbors with similar characteristics. Finally, Kiel et al. (2008) show that different levels of neighborhood effects, from a large area to the very local neighborhood, all have an impact on house price. We contribute to the literature by identifying one particular local characteristic (income inequality) of the neighborhood. The large variations of income distribution within each district in Hong Kong allow us to identify such effect, and our results may have useful implications on public housing policy.

2. Why the Hong Kong housing market?

Hong Kong is famous for being a densely populated city. According to the World Population Prospects,[1] the estimated population density in Hong Kong is 6433 people per squared kilometer for the year 2010, in contrast with 33 people in the United States, 225 people in the United Kingdom and 336 people in Japan. Of course, Hong Kong is less populated than major cities in the US like Manhattan, New York (25,850 people).[2] But since Hong Kong is characterized by high-rises and being mountainous, some of the residential areas we study are highly populated. For example, a medium-quality high-rise of 40 floors usually have more than 10 housing units on each floor, and residents are forced into having frequent interactions with neighbors (in the elevator, or even hearing a conversation from next door). As a result, Hong Kong is a more suitable case for identifying a distaste for income inequality than other cities or regions studied in the literature.

As our interest is the preference for income inequality in the neighborhood and the potential benefit of removing inequality, we need to study residential areas with significant variations of income distribution. The public housing policy in Hong Kong has contributed to the substantial income inequality in different areas of Hong Kong.

In 1953, a fire in Shek Kip Mei destroyed thousands of shanty homes. Since then, the government of Hong Kong began to construct homes for the poor. A significant portion of people in Hong Kong are inhabiting in public housing. According to 2006 census, 3.4 million people, out of 6.9 million, lived in public housing provided by the Hong Kong government. This is the greatest government intervention in a city renowned for its free-market principle.

There are three main types of public housing in Hong Kong.[3] The first type is public rental housing estates which are the most numerous type of public housing. As of 2006, 2.1 million people lived in public rental housing estates. Applicants' income and total net assets value cannot exceed certain limits, which vary between families, the elderly and individual applicants. For instance, the monthly income and total net asset limit for a two-person household are HK$11,660 and HK$252,000.

The second type is the Home Ownership Scheme (HOS) estates. These are subsidized-sale public housing estates for low-income residents. As of 2006, 1.2 million people

[1] See http://esa.un.org/unpp/ for details.

[2] See http://www.census.gov/population/www/censusdata/density.html for details.

[3] The following description is based on the information from the Hong Kong Housing Authority and the Housing Department http://www.housingauthority.gov.hk/en.