

EconomEtica

Centro interuniversitario per l'etica economica
e la responsabilità sociale di impresa
promosso dalla Fondazione Italiana Accenture

N.62 February 2017

Riccardo Borgoni, Giacomo Degli Antoni,
Marco Faillo, Alessandra Michelangeli

Preferences for living in
homogenous communities and
cooperation: a new
methodological approach
combining the hedonic price
model and a field experiment

Working papers



**Preferences for living in homogenous communities and cooperation:
a new methodological approach combining
the hedonic price model and a field experiment[§]**

Riccardo Borgoni* Giacomo Degli Antoni* Marco Faillo[♦] Alessandra Michelangeli[§]

February, 2017

Abstract

The literature on the hedonic price approach applied to housing highlights the existence of natives' preferences against living in high-dense immigrant urban areas. At the same time, empirical and experimental evidence show that ethnic fragmentation reduces cooperation at the community level. Mainly because of the difficulty to measure cooperation at the level of neighborhood, the correlation between these two phenomena is still largely unexplored. In this paper, we propose to investigate this issue by combining the hedonic price approach and a framed field experiment that allows us to collect a measure of cooperation at the neighborhood level. We show how this methodology may be implemented by carrying out a pilot study for the city of Milan. The purpose is to pave the way for further research aiming at disentangling between alternative explanations of natives' preferences for living in homogeneous communities.

Key Words: Cooperative behavior; framed field experiment, revealed preferences.

JEL Codes: C93; J15; R10; R21.

[§] Financial support by the Italian Ministry of University and Research is gratefully acknowledged. We also thank the financial support from the Experimental Economics Lab of the University of Milan-Bicocca (EELAB) and EconomEtica, inter-university center for economic ethics and corporate social responsibility. We thank the Osservatorio del Mercato Immobiliare for housing market data, and the Director of Granger Press Ltd., Daniele Belleri, for data on crime. We thank Guido Anselmi, Stefano Barberis, and Domenico Corriero for excellent research assistance. The usual disclaimer applies.

* DEMS - University of Milan-Bicocca, Piazza dell'Ateneo Nuovo 1, 20126 Milan (Italy). E-mail address: riccardo.borgoni@unimib.it

* Department of Law, Politics and International Studies, University of Parma, Via Università 12, 43125 Parma and EconomEtica, inter-university center for economic ethics and corporate social responsibility, Piazza dell'Ateneo Nuovo 1, 20126 Milan (Italy). E-mail address: giacomo.degliantoni@unipr.it

[♦] Department of Economics and Management, University of Trento, Via Inama 5, 38122, E-mail address: marco.faillo@unitn.it

[§] DEMS - University of Milan-Bicocca, Piazza dell'Ateneo Nuovo 1, 20126 Milan (Italy). E-mail address: alessandra.michelangeli@unimib.it

1. Introduction

Several studies have investigated natives' preferences towards interacting with immigrants within metropolitan areas (Cutler et al. 1999; Saiz; 2003, Saiz and Wachter 2011; Accetturo et al. 2014). In the typical model, preferences are captured through residential choices and housing market dynamics. The evidence shows that the presence of immigrants negatively affects natives' perception of local amenities (Saiz and Wachter 2011; Accetturo et al. 2014). The consequent outflow of natives from neighborhoods with higher immigrant shares to native-dense areas of the city increases residential segregation (Cutler et al. 1999), a pernicious social problem difficult to eradicate and with negative consequences on a wide spectrum of social life aspects (e.g. Massey and Denton, 1993; Guinier, 2004; Marques, 2012). From the economic perspective, the consequences of residential segregation are still debated. For example, Edin et al. (2003) find a positive effect of living in ethnic "enclaves" on labor market outcomes for less skilled immigrants. By contrast, Boeri et al. (2012) find segregation to reduce employment prospects of immigrants.

Natives' preferences for living in more homogenous areas are explained by racial or religious preferences; by the natives' perception of low socioeconomic status associated with high-density immigrant areas; or by the difficulty to communicate (e.g Accetturo et al. 2014, Saiz and Wachter, 2011). We are not aware of any previous studies investigating whether preferences of natives for living in ethnic homogeneous areas can be explained in terms of lower levels of cooperation characterizing high-density immigrants areas. This lack of analyses is quite surprising if one considers the evidence showing that ethnic fragmentation: *(i)* reduces trust (Alesina and La Ferrara, 2000, 2002; Putnam, 2007); *(ii)* results in a lower provision of public goods (Alesina et al. 1999; Miguel and Gugerty, 2005; Luttmer, 2001; Vigdor, 2002, 2004); *(iii)* undermines economic and institutional efficiency that are positively affected by

high levels of trust and cooperation (Arrow, 1974; Putnam et al. 1993; Knack and Keefer, 1997; La Porta *et al.*, 1997, 1999). More specifically, Alesina and La Ferrara (2002) argue that ethnic fragmentation reduces generalized trust mainly because people trust individuals more similar to themselves. Putnam (2007), who focuses on the short and medium run, highlights as ethnic diversity reduces both in-group and out-group trust (on the complex interconnection between ethnic difference and particularized and generalized trust, see also Bahry et al. 2005). Further evidence on the previous effects comes from laboratory studies conducted by experimental economists (Finocchiaro Castro, 2008; Carpenter and Cardenas 2011, Bornhorst et al., 2010).

Cooperation may be viewed as the result of a collective action process that leads to a Pareto-superior outcome in situations, also known as social dilemmas, characterized by a conflict between individual material self-interest and the optimal social outcome. In game-theoretical terms, these situations have the same structure of a Prisoner's Dilemma, in which the adoption of the individually optimal strategies (do not cooperate, or free-ride) leads to a socially inefficient outcome. Example of failure of cooperation are tax evasion, overuse of natural resources, pollution, littering, etc. The decision to cooperate in these contexts seems to depend, to a great extent, by expectations about others' behavior (Cialdini et al. 1990; Fischbacher et al, 2001; Bicchieri, 2006; Frey and Torgler, 2007; Fischbacher and Gaechter, 2010). Thus, trust in other's willingness to not behave opportunistically, plays a key role in the decision to cooperate.

In order to investigate if the deterioration of cooperation, which may stem from ethnic heterogeneity, contributes to explain natives' preferences against living in high-dense immigrants areas, measures of cooperation are needed. Moreover, if natives' preferences are studied by adopting the intra-city level of analysis, which allows to take into account the

heterogeneous effects across areas (Accetturo et al., 2014), the variables have to be elaborated at the district level. However, such measures are in general not included in existing national databases. We argue that experimental data collected through field experiments may provide reliable proxies for the level of cooperation characterizing different neighborhoods.

We propose a methodological approach that allows to go into the depth of the relation between natives' preferences against ethnic minorities and cooperation by combining a framed field experiment (List, 2011) and an empirical investigation based on the hedonic or implicit price approach. The former aims at measuring the level of cooperation among people of a same neighborhood. The latter is used to investigate natives' preferences with respect to the presence of immigrants in the neighborhood. As an illustration of a how these two methodologies can be combined, we present a pilot study based on data collected through an experiment involving residents in 32 districts of the municipality of Milan in a standard one-shot Public Good Game. Note that, based on the evidence provided by Accetturo et al. (2014) with respect to 20 Italian large cities, we assume that the dynamic of housing prices across different neighborhoods in relation to the presence of immigrants reveals natives' preferences towards them.

Even if our pilot study does not allow to draw robust conclusive evidence, it is an attempt to fill a gap in the literature by implementing a new methodology to analyze an under-investigated issue with relevant policy implications related to the socioeconomic effect of both cooperation and segregation previously described.

The rest of the paper is organized as follows. In Section 2 we describe the data and non-experimental variables. In Section 3 the experimental design and procedures are presented and the measure of cooperation stemming from the experiment is described. Section 4 discusses the empirical strategy. Section 5 presents the empirical findings, and Section 6 concludes.

2. Data and Variables

The data come from different sources and are combined into a single data set. Housing market data come from the Real Estate Observatory managed by the Italian Ministry of Economy and Finance, and refer to some 4,000 individual housing transactions in Milan between 2004 and 2010. The Real Estate Observatory divides the city of Milan in 55 administrative areas on the basis of housing market behavior: the division is such that prices of houses located in the same neighborhood are supposed to move together. To carry out the field experiment, described in detail in the next section, we grouped the 55 administrative areas in 32 areas (henceforth neighborhood) according to three criteria: the geographic proximity, the average price per square meter, and the number of inhabitants per administrative area (see Figure A1 in Appendix for a map). The reduction of administrative areas from 55 to 32 was imposed by the constraints of the experiment, in terms of available budget and human resources. In addition to housing market values, the data set provides information also on structural characteristics of the properties, such as total floor area, number of bathrooms, floor level, presence of a lift in the building, whether the housing unit has independent heating, built quality, presence of a parking lot. Transaction prices were converted in annual rents by applying a discount rate specific to each neighborhood, as in Andreoli and Michelangeli (2014). The discount rate was determined by dividing the average imputed rent by the average price of housing in the neighborhood, both expressed in constant 2010 Euro.

Data on socio-demographic characteristics of the city are from the municipality and refer to nationality of residents and crime incidence. The presence of foreign-born population is measured by the ratio between foreign-born population and total population at the neighborhood level (source: Census data, 2011). In 2011, foreign residents were 176,282 corresponding to the 14.2 per cent of total population, almost twice the national average of 7.5

per cent. Data on crime are from Granger Press Ltd. and refer to violent crimes reported in national and local newspapers from 2010 to 2012. The related variable is the number of crime per 1,000 inhabitants. We consider robbery, murder, violence against women and children, kidnapping. We are aware these data give only a partial information of the phenomenon, and the variable used to measure it has to be considered as a proxy. However, the problem of obtaining a suitable measure of crime is common to almost all works investigating crime (see, for example, Tita et al. 2006; Buonanno et al. 2012). In Section 4, we will address potential endogeneity problems for our measure of crime and foreign-born population.

In addition to these neighborhood characteristics, we also consider the Euclidean distance of each neighborhood from the city center, in order to handle the problem of spatial sorting on unobservables. This occurs when high-quality housing units are located in the best city neighborhoods and the factors determining the high quality of houses are unobservable (Gyourko et al., 1999.; Brambilla et al. 2013). Summary statistics are shown in Table 1; Table A1 in the Appendix sets out a full list of variables used in our analysis with their definition, source, and reference period.

Variable	Obs	Mean	Std. Dev.	Min	Max
Real housing value (in €, year 2010)	3,940	11,526	12,193	3,600	128,603
Foreign_born population	32	0.1358	0.0420	0.0671	0.2642
Crime	32	0.0952	0.0506	0.0238	0.2590
Distance from the city centre	32	3.7933	2.0266	0.4930	8.9020
<i>Experimental data</i>					
Cooperation (see section 3)	128	5.875	2.255	3.25	8.25
<i>Housing-specific characteristics</i>					
Total floor area	3,940	95.440	48.097	13	490
Number of bathrooms	3,940	1.3162	0.5592	1	6
Below third floor	3,940	0.5000	0.5000	0	1
Lift	3,940	0.8190	0.3850	0	1
Parking area	3,940	0.0091	0.0951	0	1
Low-cost building (ref.)	3,940	0.5314	0.3791	0	1
Standard quality building	3,940	0.4378	0.4961	0	1
Luxury building	3,940	0.0307	0.1725	0	1
Auton. heating sys.	3,940	0.1208	0.3259	0	1
Sold in 2005	3,940	0.1550	0.3620	0	1
Sold in 2006	3,940	0.1398	0.3468	0	1
Sold in 2007	3,940	0.1434	0.3505	0	1
Sold in 2008	3,940	0.1375	0.3444	0	1
Sold in 2009	3,940	0.1428	0.3500	0	1
Sold in 2010	3,940	0.1525	0.3595	0	1

Table 1: Summary statistics of variables

3. Measuring the cooperation at the neighborhood level

The main aim of the experiment is to provide a measure of cooperation referring to the 32 areas of Milan considered in the analysis.

The experiment was based on a standard one-shot Public Goods Game, a tool widely used in experimental economics to measure the individual willingness to cooperate in social dilemmas. Participants were matched in groups of four. Each participant received an endowment of €10 and two envelopes: the group envelope and the personal envelope and she was asked to decide how many euros to put in the group envelope and how many in the personal envelope. The money put in the group envelopes by the members of the group was

added up, multiplied by 1.5 and equally divided among the members. Each member received the following final payment:

$$\pi_i = P_i + \frac{1.5 \sum_i G_i}{4}$$

where P_i is the sum put by i in the personal envelope and G_i is the sum put by i in the group envelope. Participants received also a show-up fee of 8 euros.

Assuming self-interested individuals whose only objective is to maximize their monetary payoff, since the marginal return to the public good is smaller than 1 and greater than $1/N$, the only Nash equilibrium of this game is the one in which every member of the group chooses her dominant strategy and put zero euros in the group envelope, while the social optimum is obtained when all the members of the group put their entire endowment in the group envelope. Thus, the willingness to cooperate can be measured in terms of positive deviation from the dominant strategy.

The main peculiarity of our design consists in having groups composed of people living in the same neighborhood of the city (one of the 32 neighborhoods we considered to perform the analysis at the intra-city level).

All the information was common knowledge, including the fact that participants were matched with people living in their same area

Procedures

The experiment was run by placing stalls in different areas of the city of Milan, in different days, and by enrolling the participants on the spot.

Stalls were distributed in different urban context like malls (number of recruited in malls=9), meetings and parties of cultural associations and other organized groups (n=41), bars and pubs, streets (n=24), universities (n=54)

A poster with the logo of the University of Milano-Bicocca was placed on the stall showing the following text: “Do you live in Milan? Take part in a research on economic decisions. It will take a maximum of ten minutes. You will receive a minimum payment of €8. You will need to use only pencil and paper and no special competencies are required.”

One or two members of the research team were present. Participants accessed the stall one by one. Each participant received €3 cash and sat on a table with the experimenter. She was handed a copy of the instructions that were read aloud by the experimenter. Before taking her decision, she had to answer a set of control questions. In case of problems in answering the questions or doubts about the procedure, the experimenter tried to give assistance and did not proceed before being sure that the participant understood the instructions. The participant made her decision by using cardboards. She was told that each cardboard would be converted in money at the exchange rate of €1 per cardboard. We gave her two envelopes (the personal and the group ones) with the same alphanumeric code. She made the decision privately by dividing the cardboards between the two envelopes and putting them in two different boxes (the personal and the group box). Once she made her choice we asked her to fill in a questionnaire, with 18 socio- demographic and attitudinal questions. The questionnaire contained also monetary incentivized questions about beliefs regarding other participants’ average contribution, distinguishing by participants’ nationality.

The whole procedure took place privately, without any face-to-face interaction between the participants.

The data collection started in September 2014 and ended in June 2015

Matching and payment

At the beginning of the interaction, when subjects accept to take part in the project, they were

informed that they would have received the remaining €5 of the show up fee at the day of the final payment, and within three months. This is because the group members did not make their choice simultaneously. Consequently, the final feedback and payment were postponed at a date in which the group composition and the data collection was completed. Before leaving the stall, the participant received a card with the research team's email address and her alphanumeric identification number. She was invited to contact the team to know the exact date of the payment.

On the established day they were informed about the outcome of the game, and they were paid the remaining part of the show up fee (€5) and their final payoff.

Participants.

128 people (divided into 32 groups, one for each neighborhood of the city) took part in the experiment. 51 per cent of them were female, the average age was of 39.3 years, 92 per cent were born in Italy. These statistics are in line with those concerning the residents in 2015 of the city of Milan as a whole (average age: 45 years; percentage of females: 52.2 per cent - ISTAT). 46 per cent showed up for the final payment. The average contribution put in the group envelope was 5.875 (see Table 1) and the average payoff was equal to €13.52.

4. Empirical strategy

In this section we show our empirical strategy to estimate the effect of immigrants on housing prices and to determine whether and to what extent this effect is mediated by cooperation.

Anticipating our empirical findings, it turns out that the inclusion of the experimental measure for cooperation (the sum included in the group envelope) in the hedonic model does not

eliminate the negative statistically significant effect of the presence of immigrants on housing prices.

We adopt a semi-log functional form for the housing price equation, given by:

$$\ln p_{hnt} = \beta_0 + \mathbf{X}'_{ht}\boldsymbol{\beta}_1 + Imm'_n\beta_2 + Crime_n\beta_3 + d_n\beta_4 + v'_{ht}\beta_5 + \varepsilon_{hnt}, \quad (1)$$

where $\ln p_{hnt}$ is the price of housing unit h in neighborhood n at time t ; \mathbf{X}_{ht} is the $(K \times 1)$ vector of structural characteristics specific to housing unit h ; Imm_n is the percentage of foreign-born population over the total population in neighborhood n ; $Crime_n$ is the number of violent crimes per 1,000 inhabitants in neighborhood n ; d_n is the distance between neighborhood n and the city centre; v_{ht} is a time dummy variable equal to 1 if housing unit h was sold in t , 0 otherwise; ε_{hnt} is the usual error term.

Sociological variables, such as neighborhood ethnic composition and crime, may be endogenous to the contemporaneous value of housing prices because of reverse causation and omitted variables. In fact, immigrants' location decision may be affected by the value of housing (reverse causation). More precisely, immigrants tend to live in those neighborhoods in which home prices are lower than the city area average. In our sample, the foreign-born population ratio is negatively correlated with the housing prices; the correlation coefficient between these two variables is -0.2814. Moreover, other variables besides the foreign-born population ratio and the other covariates included in (1) may affect the market value of houses. If the foreign-born population ratio is correlated with these unobserved factors, the correlation between the foreign-born population ratio and housing prices may just be picking up the correlation between those unobserved factors and housing prices (omitted variables bias). As regard to crime rate, poorer neighborhoods with low property values could attract individuals with a higher propensity to crime or, on the contrary, higher-priced homes could attract criminal expecting to get higher payoffs from delinquent behaviour (reverse causation).

Moreover, unobserved factors correlated to crime could bias the estimated coefficient associated with the crime rate (omitted variables problem). For example, Gibbons (2004) argues that large windows, secluded gardens, or poorly maintained property - all housing-specific characteristics for which we do not have data - may affect both crime and housing prices. We address potential endogeneity problems by considering two types of instruments for foreign-born population and crime. For the former, we follow the approach, developed first by Card (2001) and later by Saiz and Wachter (2011), based on a gravity model in which the percentage of foreign-born population in neighborhood n depends positively of the previous settlements of this population across neighborhoods adjacent to n , and negatively of the distance between neighborhood n and adjacent neighborhoods. In formal terms, it can be expressed as follows:

$$Pull_n = \sum_{q \in Q(n)} \frac{Imm_{q,T-20} \cdot Area_q}{d_{nq}^2}, \quad (2)$$

where q denotes the neighborhood adjacent to n ; $Q(n)$ is the set of neighborhoods adjacent to n ; $Imm_{q,T-20}$ is the percentage of foreign-born population twenty years earlier; $Area_q$ is the area (in square kilometre) of neighborhood q ; d is the Euclidean distance between neighborhood q and neighborhood n .

For the latter, we follow Buonanno and Montolio, (2009) and Buonanno et al. (2009), by considering as instrument the percentage of youth aged between 15 and 24. Several works, such as Freeman (1991), Grogger (1998) and Levitt and Lochner (2001), show that younger people are more prone to engage in criminal activities than the rest of the population.

5. Results

Column 1 of Table 2 shows the regression results of model (1); column 2 shows the results of model (1) including the variable cooperation among the covariates. The model was estimated via three stage least squares (3SLS). We used the Stata command `reg3`, which uses an instrumental-variables approach to produce consistent estimates and generalized least squares (GLS) to account for the correlation structure in the disturbances across the equations.¹ All in all, the explanatory variables used in the model account for about 75 per cent of the variance of the logarithm of price.

¹ It can be thought of as producing estimates from a three-step process. The first step develops instrumental variables for the endogenous variables, i.e. housing price (in log); foreign-born percentage; violent crime. The instrumental variables correspond to the predicted values resulting from the regression of each endogenous variable on all the exogenous variables. The second step provides a consistent estimate for the covariance matrix of the equation disturbances. These estimates are based on the residuals from a 2SLS estimation of each structural equation. The third step performs a GLS-type estimation using the covariance matrix estimated in the second stage and with the instrumental variables in place of the right-hand-side endogenous variables (see Davidson and MacKinnon, 1993; Green, 2012 for further details).

Variable	<i>Model I</i>	<i>Model II</i>
Total floor area	0.0076 (52.09)**	0.0076 (52.18)**
Number of bathrooms	0.1105 (8.78)**	0.1095 (8.70)**
Below third floor	-0.0123 (1.20)	-0.0122 (-1.19)
Lift	0.0415 (2.98)**	0.0390 (2.80)**
Parking area	0.2302 (4.39)**	0.2226 (4.24)**
Standard quality building	0.0751 (6.60)**	0.0737 (6.47)**
Luxury building	0.1201 (3.76)**	0.1136 (3.54)**
Auton. heating sys.	0.0334 (2.10)*	0.0335 (2.11)*
Distance from the city centre	-0.0962 (-37.43)**	-0.0991 (-38.54)**
Foreign-born pop (%)	-0.1138 (-36.38)**	-0.1132 (-36.20)**
Cooperation		0.0135 (3.66)**
Crime	-0.0262 (-15.13)**	-0.0260 (-14.92)**
Sold in 2005	0.0524 (2.79)**	0.0539 (2.87)**
Sold in 2006	0.0825 (4.27)**	0.0832 (4.31)**
Sold in 2007	0.0570 (2.97)**	0.0576 (3.00)**
Sold in 2008	0.0542 (2.77)**	0.0540 (2.76)**
Sold in 2009	0.0168 (0.87)**	0.0171 (0.89)**
Sold in 2010	-0.0128 (-0.67)**	-0.0118 (-0.62)**
Constant	8.469 (332.50)**	8.4018 (251.62)**
R-sq.	0.7457	0.7489
nb. obs.	3,940	3,940

Dependent variable: log housing prices *Significance at the 0.05 level; **Significance at the 0.01 level.

Table 2: regression results

All the neighborhood-level variables are statistically significant at the 0.01 level. Housing values are lower in neighborhoods with higher crime rates and shares of foreigners, while they are positively related to cooperation. Moreover, the inclusion of the variable Cooperation does not rule out the significant effect of the presence of immigrants on the price of houses.

The size and the level of significance of the variable on foreign-born population are virtually unchanged when Cooperation is included in the estimates (column 1 and 2, respectively).

Housing prices are on average higher in the city centre and decrease as the distance from the centre increases. This result is consistent with the results of previous studies providing empirical evidence for a monocentric shape of the residential housing market in Milan (Michelangeli and Zanardi, 2009; Brambilla et al., 2013), and describing the historical and political roots of the monocentric structure of Milan (Gonzales et al., 2009).

Seven out of eight housing-specific characteristics turn out to be statistically significant and with the expected sign.

Table 3 shows the hedonic prices for the neighborhood-level amenities,² and referring to the two specifications reported in Table 1. In order to compare the relative size of the effects of different amenities, hedonic prices are computed considering a marginal variation in the corresponding amenity equal to 1 standard deviation, keeping all the other covariates at the average sample quantities.

Variable	<i>Model I</i>	<i>Model II</i>
Foreign-born	-80.60	-80.46
Cooperation	•	310
Crime	-22.40	-22.29

Table 3: implicit prices of minority groups, cooperation and crime

Cooperation shows the highest price, followed by foreign-born population and crime in absolute value. An increase of foreign-born population and crime by one standard deviation must be compensated by €80 and €22, respectively. On the contrary, people on average is willing to pay €310 for an increase in cooperation by one standard deviation. Then an increase of the latter more than offset an increase of the former variables.

² Hedonic prices of housing-specific characteristics are available upon request.

6. Concluding Remarks

The empirical analyses based on the hedonic price approach gives support to the existence of natives' preferences against living in areas characterized by high presence of immigrants. However, the motivational drivers behind these preferences have not been clearly identified yet. Since the experimental and empirical evidence shows a negative impact of ethnic fragmentation on cooperation at the community level, one may wonder if the latter effect explains the preferences of natives for living in homogeneous neighborhoods.

We have proposed a new approach based on the combination of the hedonic prices analysis and a framed field study aimed at identifying a possible role of the erosion of cooperation in the explanation of natives' preferences against living in high-dense immigrants neighborhoods. We have illustrated how these two methodologies can be combined by carrying out a pilot study based on data collected through a one-shot Public Good Game involving residents in 32 districts of the municipality of Milan.

We provided preliminary evidence leading to two main results. First, the presence of immigrants reduces housing prices, thus revealing a preference for living in homogeneous communities. Second, the effect of the presence of immigrants on housing prices seems not to be explained by an actual erosion of cooperation in the neighborhoods characterized by a higher presence of immigrants. When we include our experimental measure of cooperation in the hedonic model based on housing prices, the size and the level of significance of the variable on the percentage of immigrants are virtually unchanged.

While the first result is based on a large dataset and confirms, at the level of neighborhoods belonging to the metropolitan area of Milan, the negative effect of immigrants on housing prices, the other result stems from the inclusion in the hedonic model of an experimental variable based on a limited number of observations and need to be validated by further

researches.

We argue that the new methodological approach used in this contribution, which combines the hedonic price approach with a framed field experiment, may be replicated to analyze more into the depth the explanations behind natives' preferences for living in homogenous communities. Experiments may be expressly designed in order to collect at the level of urban areas further measures of cooperation and of other aspects, such as trust and reciprocity, or those mentioned in the introduction as possible reasons behind natives' residential choices, such as racial factors.

References

- Accetturo, A., F. Manaresi, S. Mocetti and E. Olivieri (2014) Don't stand so close to me: The urban impact of immigration. *Regional Science and Urban Economics* 45(C), 45-56.
- Alesina, A., R. Baqir and W. Easterly (1999) Public Goods and Ethnic Divisions. *The Quarterly Journal of Economics* 114(4), 1243–1284.
- Alesina, A. and E. La Ferrara (2000) Participation in heterogeneous communities. *The quarterly journal of economics* 115(3), 847-904.
- Alesina, A. and E. La Ferrara (2002) Who trusts others?. *Journal of public economics* 85(2), 207-234.
- Andreoli, F. and A. Michelangeli (2014) Welfare Measures to Assess Urban Quality of Life. Working Paper n. 278, University of Milano-Bicocca, Department of Economics.
- Arrow, K.E. (1974) *The limits of organization*. Norton, New York.
- Bahry, D. M. Kosolapov, P. Kozyreva and R.K. Wilson (2005) Ethnicity and trust: Evidence from Russia. *American Political Science Review* 99(04), 521-532.
- Bicchieri, C. (2006) *The Grammar of Society: The Nature and Dynamics of Social Norms*. Cambridge University Press.
- Boeri, T., M. De Philippis, E. Patacchini and M. Pellizzari (2012) Moving to segregation: Evidence from 8 Italian cities. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2157976 (accessed 9 February 2017).
- Bornhorst, F., A. Ichino, O. Kirchkamp, K. Schlag and E. Winter (2010) Similarities and differences when building trust: the role of cultures. *Experimental Economics* 13(3), 260-283.
- Brambilla, M.G., A. Michelangeli and E. Peluso (2013) Equity in the City: On Measuring Urban (In)Quality of Life. *Urban Studies* 50, 3205-3224.
- Buonanno P. and D. Montolio (2009) Juvenile crime in Spain. *Applied Economic Letters* 16, 495–500.
- Buonanno, P., D. Montolio and P. Vanin (2009) Does Social Capital Reduce Crime? *Journal of Law and Economics* 52, 145-170.
- Buonanno P., D. Montolio and J.M. Raya-Vilchez (2012) Housing prices and crime perception. *Empirical Economics* 1, 305–321.
- Carpenter, J. and J.C. Cardenas (2011) An inter-cultural examination of cooperation in the commons. *Journal of Conflict Resolution* 55(4), 632-651.
- Cialdini, R., C. Kallgren and L. Reno (1990) A Focus Theory of Normative Conduct: A Theoretical Refinement and Reevaluation of the Role of Norms in Human Behavior. *Advances in Experimental Social Psychology* 23, 201-234.
- Cutler, D.M., E.L. Glaeser and J.L. Vigdor (1999) The Rise and Decline of the American Ghetto. *Journal of Political Economy* 107(3), 455-506.
- Davidson, R., and J.G. MacKinnon (1993) *Estimation and Inference in Econometrics*. New York, Oxford University Press.
- Edin, P-A., P. Fredriksson O. and Åslund (2003) Ethnic Enclaves and the Economic Success of Immigrants — Evidence from a Natural Experiment. *The Quarterly Journal of Economics* 118(1), 329-357.
- Finocchiaro Castro, M. (2008) Where are you from? Cultural differences in public good experiments. *Journal of Socio-Economics* 37, 2319-2329.
- Fischbacher, U. and S. Gaechter (2010) Social preferences, beliefs, and the dynamics of free riding in public goods experiments. *American Economic Review* 100, 541-556.
- Fischbacher, U, S. Gächter and E. Fehr (2001) Are people conditionally cooperative? evidence from a public goods experiment. *Economics Letters* 71(3), 397-404,

- Freeman R.B. (1991) Crime and the Employment of Disadvantaged Youths. Working Paper No. 3085, National Bureau of Economic Research, Cambridge, Mass.
- Frey, B.S., and B. Torgler (2007) Tax morale and conditional cooperation. *Journal of Comparative Economics* 35, 136–159.
- Gibbons, S. (2004). The costs of urban property crime. *Economic Journal*, 114, F441-F463.
- Greene, W.H. (2012) *Econometric Analysis*. 7th ed. Upper Saddle River, NJ: Prentice Hall.
- Grogger, J.T. (1998) Market Wages and Youth Crime. *Journal of Labor Economics* 16, 756-791.
- Guinier, L. (2004) From racial liberalism to racial literacy: Brown v. Board of Education and the interest-divergence dilemma. *The Journal of American History* 91(1), 92-118.
- Gonzales, S. (2009) (Dis)connecting Milan(ese): deterritorialised urbanism and disempowering politics in globalizing cities. *Environment and Planning A* 41, 31–47.
- Gyourko, J., M. Kahn and J. Tracy (1999) Quality of life and environmental comparisons. In P. C. Cheshire and E. S. Mills (eds) *Handbook of Regional and Urban Economics*, vol. 3, 1413–1454. Amsterdam, Elsevier.
- Knack, S. and P. Keefer (1997) Does Social capital have an economic payoff? A cross country investigation. *The Quarterly Journal of Economics* CXII, 1251-1287.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny (1997) Trust in Large Organizations. *AEA papers and proceedings* 82(2) 333-338.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. Vishny (1999) The quality of government. *Journal of Law, Economics, and organization* 15(1), 222-279.
- Levitt, S.D. and L. Lochner (2001) The determinants of juvenile crime. In: *Risky behavior among youths: an economic analysis*, University of Chicago Press, 327–374.
- List, J. (2011) Why Economists Should Conduct Field Experiments and 14 Tips for Pulling One Off. *Journal of Economic Perspectives* 25(3), 3-16.
- Luttmer, E. (2001) Group loyalty and the taste for redistribution. *Journal of Political Economy* 109, 500–528.
- Marques, E. (2012) Social networks, segregation and poverty in São Paulo. *International Journal of Urban and Regional Research* 36(5), 958-979.
- Massey D.S. and N.A. Denton (1993) *American Apartheid: Segregation and the Making of the Underclass*. Cambridge, MA, Harvard University Press.
- Michelangeli, A. and A. Zanardi (2009) Hedonic-based price indexes for the housing market in Italian cities: theory and estimation. *Politica Economica* 2, 109–146.
- Miguel, E. and M.K. Gugerty (2005) Ethnic diversity, social sanctions, and public goods in Kenya. *Journal of Public Economics* 89(11–12), 2325–2368.
- Putnam, R.D. (2007) E pluribus unum: Diversity and community in the twenty-first century the 2006 Johan Skytte Prize Lecture. *Scandinavian political studies* 30(2), 137-174.
- Putnam, R.D., R. Leonardi and R.Y. Nanetti (1993) *Making democracy work: Civic traditions in modern Italy*. Princeton university press.
- Saiz, A. (2003) Room in the kitchen for the melting pot: Immigration and rental prices. *Review of Economics and Statistics* 85(3), 502-521.
- Saiz, A. and S. Wachter (2011) Immigration and the Neighborhood. *American Economic Journal: Economic Policy* 3, 169-188.
- Tita, G.E., T.L. Petras and R.T. Greenbaum (2006) Crime and Residential Choice: A Neighborhood Level Analysis of the Impact of Crime on Housing Prices. *Journal of Quantitative Criminology* 22, 299-317.
- Vigdor, J. (2002) Interpreting ethnic fragmentation effects. *Economics Letters* 75, 271-276.
- Vigdor, J. (2004) Community composition and collective action: analyzing initial mail response to the 2000 census. *Review of Economics and Statistics* 86(1), 303-312.

Appendix



Figure A1: 32 neighborhoods of Milan

Variable	Definition	Source; reference period
ln(P)	Real housing value (in logs; year 2010)	OMI; 2004-2010
Foreign-born population	Percentage of foreign residents	Census data; 2011
Crime	Number of violent crimes (robbery, murder, violence against women and children, kidnapping) per 1,000 inhabitants	Granger Press Ltd; 2010-2012
Distance from the city centre	Distance from the city centre	Authors' computation
Cooperation	Amount of money included in the group envelope	Experimental measure
<i>Housing specific characteristics</i>		
Total floor area	Total floor surface area	
Number of bathrooms	Number of bathrooms	
Below third floor	1 if the housing unit is on the 2nd floor or lower	
Lift	1 if the unit is in a building with at least one elevator	
Parking area	1 if the unit has at least one parking space	
Low-cost building	1 if the unit is in a low-cost building (ref.)	
Standard quality building	1 if the unit is in a medium-cost building	
Luxury building	1 if the unit is in a luxury building	OMI, 2004-2010
Auton. heating sys.	1 if the unit has gas autonomous heating	
Sold in 2005	1 if the unit was sold in 2005	
Sold in 2006	1 if the unit was sold in 2006	
Sold in 2007	1 if the unit was sold in 2007	
Sold in 2008	1 if the unit was sold in 2008	
Sold in 2009	1 if the unit was sold in 2009	
Sold in 2010	1 if the unit was sold in 2010	

Table A1: Description and sources of variables