

Natives; Immigrants and Social Cohesion:

Intra-city analysis combining the hedonic approach and a framed field experiment[§]

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Abstract

The literature on the hedonic price approach applied to housing highlights the existence of natives' preferences against living in urban areas with high foreign-born population. At the same time, empirical and experimental evidence show that ethnic fragmentation reduces social cohesion in society. Mainly because of the difficulty to measure social cohesion at the neighbourhood level, the correlation between these two phenomena is still largely unexplored. In this paper, we investigate natives' preferences for immigrants following an original approach that combines the hedonic price approach and a framed field experiment. The latter allows us to collect a measure of cooperation at the neighborhood level. We apply this methodology to the city of Milan. Our findings show that natives prefer to live in non-dense immigrants neighborhoods. However, this preference is not attributable to an erosion of social cohesion in those areas.

Key Words: Social cohesion; framed field experiment; hedonic approach.

JEL Codes: C93; J15; R10; R21.

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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 that shape housing market dynamics. The pattern of housing prices determined by the presence of immigrants in the neighborhood reveals native's preferences towards them. While many variables positively affect residential decision, such as the proximity to green areas or good schools for children, the evidence shows that the presence of immigrants negatively affects natives' perception of neighborhoods and local amenities. This is particularly the case for the United States (Clapp et al. 2008; Saiz and Wachter 2011) and other developed countries (see, for example, Li 2014 for Canada; Accetturo et al. 2014 for Italy; Sà for UK). Preferences towards immigrants may favor an outflow of natives from neighborhoods with higher immigrant shares to native-dense areas of the city and consequently increase 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.

Native-born preferences for avoiding immigrant areas may be due to preferences for living with other natives or to preferences for living with individuals of higher socioeconomic status. Saiz and Wachter (2011), for example, argue that immigrant neighborhoods may become less attractive not because they are populated by the foreign born *per se*, but because they are more

likely to contain populations with perceived low socioeconomic status.

In this paper, we explore another possible explanation of natives' preferences for living in native-dense areas. We ask whether these preferences are attributable to the erosion of social cohesion in high-dense immigrants neighborhoods. This question arises from a number of studies, surveyed in Section 2, showing that ethnic minorities may have a negative impact on some relevant dimensions of social cohesion of society. When considering the notion of social cohesion we follow what proposed by Kearns and Forrest (2000): "The kernel of the concept is that a cohesive society 'hangs together'; all the component parts somehow fit in and contribute to society's collective project and well-being; and conflict between societal goals and groups, and disruptive behaviours, are largely absent or minimal" (Kearns and Forrest, 2000, p.996).

To provide an answer to our research question, we propose an empirical methodology relying on the hedonic or implicit price approach applied to the housing market. The novelty of the paper is that in the housing price equation we include two measures of the degree of social cohesion at the neighborhood level as covariates. The first measure is obtained from a framed field experiment (List, 2011) involving residents city neighborhoods in a standard one-shot Public Good Game. The latter allows to determine the individual willingness to cooperate in social dilemmas (Dayton-Johnson, 2003). The second measure is the number of cultural associations in city neighborhoods, which are supposed to be able to "instill in their members habits of cooperation, solidarity, and public-spiritedness" (Putnam, Leonardi and Nanetti 1993, pp. 89-90).¹ Indeed, members of cultural associations show higher level of generalized trust than non-members (Degli Antoni and Grimalda, 2016). Stolle and Rochon (1998) find that

¹ These possible effects of voluntary associations on subjects' pro-sociality have received great attention within the literature on social capital, with particular reference with the distinction between olson-type and putnam-type associations (see Olson, 1965,1982; Putnam, Leonardi and Nanetti 1993, Knack and Keefer, 1997) and between bridging and bonding social capital (Narayan, 1999). For a definition of social capital and a taxonomy of the different dimensions that characterize the concepts, see Uphoff (1999) and Paldam (2000).

members of cultural associations present significantly higher score than non-members in an index based on survey questions on whether people are trustworthy and helpful.

The experimental measure of cooperation and the number of cultural associations may be considered as indicators of social cohesion following the approach by Kearns and Forrest (2000), since they are related to social networks and social capital. The latter are two dimensions of social cohesion (Kearns and Forrest, 2000).² Social networks together with networks of civic engagement (associational activity in neighbourhood and community organisations), are constitutive of and producers of social capital.

Given the nature of variables, the core-concept of the paper is social cohesion, which is a concept wider than cooperation since it includes both cooperation and social capital.

A cohesive society is one in which dilemmas and problems can be easily solved by collective action—and this is more so in the case where existing relationships and networks sustain the expectations, norms and trust which facilitate such solutions.” (Kearns and Forrest, 2000, p.1000).

Our findings for the Italian city of Milan show that natives prefer to live in non-dense immigrant neighborhoods. However, this preference is not attributable to an actual reduction of the degree of social cohesion in those areas. Indeed, the inclusion of our measures of social cohesion in the hedonic regression model does not affect the impact of immigrants on houses’ prices. This means that natives’ preferences against ethnic minorities are not mediated by the effect of immigrants on social cohesion in the neighborhood.

The rest of the paper is organized as follows. In Section 2 we briefly review the related literature. In Section 3 we describe the data and the variables. Section 4 discusses the empirical

² The other dimensions are: Common Values and a Civic Culture, Social Order and Social Control, Social Solidarity and Reductions in Wealth Disparities, Place Attachment and Identity.

strategy. Section 5 presents the empirical findings, and Section 6 concludes.

2. Housing price, immigrants and social cohesion: a view from the literature

This paper combines two strands of literature, which have been developed independently in the last few decades. The first strand is about the negative effect of immigrants on housing prices within a city. The causation relationship between housing prices and immigrants is not direct but it is mediated by different causal channels.³ Besides the explanations mentioned in the Introduction, previous studies provide other potential explanations for this outcome. Immigration may negatively affect the quality of the housing stock that in turn decreases the value of housing (Saiz 2007); may increase the risk of crime (Yinger 2016) or affect the quality of local public goods, such as schools (Bayer et al. 2007). The consequence is always a decrease in housing prices. This strand of literature also shows how immigrants affect houses prices and viceversa mainly because of reverse causation and omitted variables. In Section 4 we show how our empirical strategy deals with these two problems.

The second strand of literature looks at the relationship between ethnic fragmentation and determinants of the degree of social cohesion of a society like trust and willingness to cooperate (Forrest and Kears, 2001, Dayton-Johnson, 2003). Alesina and La Ferrara (2002) argue that ethnic fragmentation reduces generalized trust mainly because people trust individuals more similar to themselves. Putnam (2007) highlights that ethnic diversity reduces both in-group and out-group trust (on the complex interconnection between ethnic difference and particularized

³ Saiz and Watcher (2011) show in Figure 2 the causal channels that we discuss in this section.

and generalized trust, see also Bahry et al. 2005). Further support to this evidence comes from laboratory studies on cooperation, involving participants belonging to different nationalities, and reporting a decrease in cooperation in cultural heterogeneous groups and ethnic discrimination in trust and altruism (Fershtman and Gneezy, 2001; Fershtman et al., 2005; Finocchiaro Castro, 2008; Carpenter and Cardenas 2011,). In these type of studies, cooperation is 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.

3. Data and Variables

In this section, we present the data and variables used in the empirical model presented in Section 4. The data come from different sources and are combined into a single data set. Summary statistics are shown in Table 1; Table A1 in Appendix 1 sets out a full list of variables used in our analysis with their definition, source, and reference period.

3.1 Data on housing market

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 framed field experiment, described in detail in the next section (section 3.2) and in the Appendix 2, 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 1 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.

3.2 Data on social cohesion.

The first measure of social cohesion is obtained by an experiment carried out in 32 Milan neighborhoods. The experiment is based on a standard one-shot Public Goods Game, which is 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:

$$8 + \frac{1.5 G_i}{N}$$

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 number of euros put in the group envelope, i.e. 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

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.

The procedures concerning the experiment are described in details in Appendix 2.

In addition to this variable, we consider also the number of cultural association per 10,000 inhabitants in the neighborhood. As mentioned in Introduction, cultural associations are a proxy of various dimensions of social cohesion within a neighborhood.

3.3 Data on nationality of residents

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 equal to 7.5 per cent.

3.4 Data on crime

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).

3.5 Data on other houses' and neighborhoods' characteristics

In addition to these socio-demographic characteristics, we also consider the Euclidean distance of each housing unit from the nearest metro station and from the nearest public green area. More

precisely, the latter variable is the distance between the housing unit and the nearest green area multiplied by the size of park (in hectares).

Finally, we consider the 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).

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
Nb. of cultural associations	32	0.7780	1.6916	0	11.7296
Distance from the metro station	32	0.7519	0.5793	0.0011	3.4426
Distance from green areas	32	549.2703	355.0806	9.3046	2817.529
Distance from the city centre	32	3.7933	2.0266	0.4930	8.9020
<i>Experimental data</i>					
Cooperation	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

4. Empirical strategy

In this section, we present 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.

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

$$p_{hnt} = \alpha_0 + \alpha_1 \ln(x_{hnt}) + \alpha_2 F_{nt} + \alpha_3 C_{nt} + \alpha_4 D_{nt} + \alpha_5 Y_{nt} + \epsilon_{hnt} \quad (1)$$

where p_{hnt} is the price of housing unit h in neighborhood n at time t ; x_{hnt} is the vector of structural characteristics specific to housing unit h ; F_{nt} is the percentage of foreign-born population over the total population in neighborhood n ; C_{nt} is the number of violent crimes per 1,000 inhabitants in neighborhood n ; D_{nt} is the distance between neighborhood n and the city centre; Y_{nt} is a time dummy variable equal to 1 if housing unit h was sold in 2010 otherwise; ϵ_{hnt} is the usual error term.

Sociological variables, such as immigrants 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 Watcher (2011), based on a gravity model in which the percentage of foreign-born population in neighborhood i depends positively of the previous settlements of this population across neighborhoods adjacent to i , and negatively of the distance between neighborhood i and adjacent neighborhoods. In formal terms, it can be expressed as follows:

$$F_{i,t} = \alpha + \beta \sum_{j \in N_i} F_{j,t-20} + \gamma \frac{A_j}{D_{ij}} + \epsilon_{i,t} \tag{2}$$

where i denotes the neighborhood adjacent to j ; N_i is the set of neighborhoods adjacent to i ; $F_{j,t-20}$ is the percentage of foreign-born population twenty years earlier; A_j is the area (in square kilometre) of neighborhood j ; D_{ij} is the Euclidean distance between neighborhood i and neighborhood j .

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); columns 2 and 3 shows the results of model (1) including the variable on cooperation and on cultural associations among the covariates; respectively. The model was estimated via three stage least squares (3SLS). We used the Stata command `reg3`, which applies 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.⁴ All in all, the explanatory variables used in the model account for about 75 per cent of the variance of the logarithm of price.

⁴ 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>	<i>Model III</i>
Total floor area	0.0076 (52.00)**	0.0076 (52.16)**	0.0076 (53.50)**
Number of bathrooms	0.1085 (8.55)**	0.1064 (8.46)**	0.0993 (8.25)**
Below third floor	-0.0113 (-1.30)	-0.0107 (-1.29)	-0.0143 (-1.46)
Lift	0.0415 (2.91)**	0.0365 (2.62)**	0.0390 (2.92)**
Parking area	0.2332 (4.43)**	0.2223 (4.23)**	0.2407 (4.79)**
Standard quality building	0.0731 (6.52)**	0.0715 (6.39)**	0.0736 (6.87)**
Luxury building	0.1291 (4.05)**	0.1194 (3.74)**	0.0809 (2.65)**
Auton. heating sys.	0.0337 (2.35)*	0.0377 (2.39)*	0.0351 (2.32)*
Metro	-0.0412 (-4.42)**	-0.0508 (-5.38)**	-0.023 (-2.57)**
Green areas	-0.0206 (-1.52)	-0.0232 (-1.70)	-0.0245 (-1.96)*
Distance from the city centre	-0.0962 (-37.43)**	-0.0994 (-33.56)**	-0.0761 (-25.30)**
Foreign-born pop (%)	-0.1136 (-36.33)**	-0.1128 (-36.09)**	-0.1133 (-36.09)**
Cooperation		0.0183 (4.88)**	
Nb of cultural associations			0.0076 (22.29)**
Crime	-0.0261 (-15.09)**	-0.0259 (-14.84)**	-0.0237 (-14.84)**
Sold in 2005	0.0514 (2.74)**	0.0539 (2.86)**	0.0419 (2.96)**
Sold in 2006	0.0815 (4.21)**	0.0821 (4.32)**	0.0721 (4.10)**
Sold in 2007	0.0570 (2.97)**	0.0536 (3.01)**	0.0589 (4.01)**
Sold in 2008	0.0542 (2.77)**	0.0520 (2.56)**	0.0570 (2.36)**
Sold in 2009	0.0138 (0.87)	0.0171 (0.89)**	0.0169 (0.79)**
Sold in 2010	-0.0158 (-0.67)**	-0.0111 (-0.72)**	-0.0131 (-0.02)**
Constant	8.5345 (370.97)**	8.4185 (271.72)**	8.4298 (362.14)**
Adj. R-sq.	0.7617	0.7686	0.7884
nb. obs.	3,940	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 and to the number of cultural associations in the neighborhood. 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 coefficient associated with the percentage of foreign-born population are virtually unchanged when the variable on cooperation (column 1 and 2, respectively) or the number of cultural associations in the neighborhood (column 1 and 3, respectively) are included in the specification.

Housing prices decrease as the distance from metro stations and green areas increases. 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 key-variables of the analysis,⁵ and referring to the three 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>	<i>Model III</i>
Foreign-born	-79.46	-79.12	-79.61
Cooperation	•	297,23	297,44
Nb of cultural associations			173

⁵ Hedonic prices of housing-specific characteristics are available upon request.

Crime	-22.64	-22.13	-22.69
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Table 3: implicit prices of minority groups, social cohesion and crime

Cooperation shows the highest price, followed by the number of cultural associations, foreign-born population and crime in absolute value. An increase of foreign-born population and crime by one standard deviation must be compensated by about €80 and €22, respectively. On the contrary, people on average is willing to pay about €295 for an increase in cooperation by one standard deviation and about 173€ for an increase in the number of cultural associations by one standard deviation. Then an increase of the latter more than offset an increase of the former variables.

6. Concluding Remarks

This paper is an original attempt to bridge the gap between the urban economics and the social cohesion literature. Starting from the premise that immigrants influence resident location decisions of natives and that ethnic fragmentation may have a negative impact on some important dimensions of social cohesion of society (see Section 2), we have proposed a new empirical approach to determine whether natives' preferences against immigrants are attributable to a reduction of social cohesion in high-dense immigrants neighborhoods. Our approach is based on the hedonic price analysis in which we consider two different proxies of social cohesion. A measure of cooperation based on a framed field experiment and the number of cultural associations in the neighborhood.

Our findings for the city of Milan confirm the existence of natives' preferences against immigrants. However, the effect of the presence of immigrants on housing prices is not explained by an actual erosion of social cohesion in the neighborhoods characterized by a higher

presence of immigrants. Indeed, when we include alternative measures of social cohesion in the hedonic price equation, the size and the level of significance of the coefficient associated with the percentage of immigrants are virtually unchanged.

In future research, it would be interesting to identify whether and how specific features of ethnic minorities, such as language diversity, religion affiliation, places of birth or origin, explain the negative attitudes of natives towards immigrants. It would be also important to determine the role of historical and social background specific to each country or region in affecting the relationship between the presence of immigrants and natives' preferences.

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Appendix 1



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
Cultural associations	Nb. of cultural associations per 10,000 inhabitants	Authors' computation
Metro	Euclidean distance from the nearest metro station	Authors' computation
Green areas	Euclidean distance from the nearest green area multiplied by the size (ha) of the public park	Authors' computation
Distance from the city centre	Euclidean distance from the city centre (km)	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

Appendix 2

Experimental procedures

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.

INSTRUCTIONS

Dear participant,

We will read the following instructions together, please, pay attention during the reading. If something is not clear please ask me questions.

You have already received 3 euro for the participation in the research project. Moreover, from next week, you will have the opportunity to receive other **5 euro** and a **further sum of money** according to the procedure described below. This further sum of money will depend both on a decision that you will take and a decision taken by other persons you will be paired with.

To summarize:

Today:	3 euro
From next week:	5 euro and a further sum of money depending on the decisions that will be presented below.

In particular, we are asking you to participate in an activity and later fill in a questionnaire.

CHOICES WILL REMAIN COMPLETELY ANONYMOUS

As will be clear by reading the instructions below, to compute the amount of money that you could earn, we ask you the report:

The area of Milan where you live: _____

How long have you lived in this area (number of years): _____

Both the activity and the questionnaire have exclusively scientific purposes. They are part of a research project conducted by the University of Milano Bicocca.

Thank you for your collaboration

The decision that you are going to take involves **a group made of 4 people**.

THE PARTICIPANTS IN THE DECISION

The group is made of you and other 3 persons who live in your same area

The other persons are not here now. The group will be formed after the decision you are going to take. Your decision will be associated with those taken by other people randomly chosen among participants who live in your area. These people may have already taken the decision in the past few days, may take the decision today or in the next days.

Neither you nor the other participants will be able to know the identity of the other people in your group.

CHARACTERISTICS OF THE DECISION

- ✓ Researchers make available 10 euro to each of the 4 persons of the group.
- ✓ You have to decide how many of these 10 euro (between 0 and 10) to put in the envelope “Personal” and how many in the envelope “Group”. The other members of your group have to do the same.
- ✓ Money put in the envelope “Group” by each member of the group will be multiplied by 1.5 and equally divided among all members of the group.
- ✓ The final payment of each member of the group will be equal to the amount put by herself in the envelope “Personal” plus her share of the total amount of money for the group (figure 1).
- ✓ Let us consider a few examples (see figures).

Example 1.

- The first member of the group decides to put in the envelope “Personal” 2€ and in the envelope “Group” 8€.
- The second member of the group decides to put in the envelope “Personal” 3€ and in the envelope “Group” 7€.
- The third member of the group decides to put in the envelope “Personal” 4€ and in the envelope “Group” 6€.
- The fourth member of the group decides to put in the envelope “Personal” 3€ and in the envelope “Group” 7€.
- The amount collected for the group is: $8+7+6+7 = 28€$. These 28€ are multiplied by 1.5. We obtain a “Sum for the group” equal to 42€. Each member of the group will receive: $42/4= 10.5€$.
- So in the end, for this decision, the first member of the group will receive $2+10.5=12.5€$, the second member of the group $3+10.5=13.5€$, the third member of the group $4+10.5=14.5€$, the fourth member of the group $3+10.5=13.5€$.

Example 2.

- The first member of the group decides to put in the envelope “Personal” 9€ and in the envelope

“Group” 1€.

- The second member of the group decides to put in the envelope “Personal” 2€ and in the envelope “Group” 8€.
- The third member of the group decides to put in the envelope “Personal” 10€ and in the envelope “Group” 0€.
- The fourth member of the group decides to put in the envelope “Personal” 7€ and in the envelope “Group” 3€.
- The amount collected for the group is: $1+8+0+3 = 12€$. These 12€ are multiplied by 1.5. We obtain a “Sum for the group” equal to 18€. Each member of the group will receive: $18/4 = 4.5€$.
- So in the end, for this decision, the first member of the group will receive $9+4.5=13.5€$, the second member of the group $2+4.5=6.5€$, the third member of the group $10+4.5=14.5€$, the fourth member of the group $7+4.5=11.5€$.

The same information given to you will be given to the other persons of your group.

Before taking the decision, we would like to ask you to answer the following three questions in order to solve any doubts

1) What happens every time 1 euro is put in the envelope “Group”?

- Nothing
- Is divided by 2
- Is multiplied by 1.5

2) What happens to the amount of money put in the envelope “Personal”?

- Is mine without being changed
- Is mine after being divided by 2
- Is mine after being multiplied by 1.5

3) Each member of the group receives an equal share of the “Sum for the group”

- True
- False

Now, let’s go to the decision.

Please, choose how many of the 10 euro at your disposal you decide to put in the envelope “Personal” (between 0€ and 10€) and how many in the envelope “Group” (between 0€ and 10€).

You will take your decision by using cards each one representing 1€. Cards will be converted in money when you will be paid.

BEFORE GOING ON WITH THE DECISION, WE WOULD LIKE TO RECALL YOU THAT:

- Each group is made of you and other 3 persons who live in your same area

- The amount of money at disposal of each participant is equal to 10 euro
- The amount put in the envelope “Personal” becomes yours
- The amount put in the envelope “Group” is added to the other amounts put in the envelopes “Group” by the other members of the group, multiplied by 1.5 and divided in four equal shares.

5. Marital status

- Single
- Married
- Cohabitant
- Widow/er
- Separated if separated how many years ago did the separation happen: _____
- Divorced if divorced how many years ago did the divorce happen: _____
- How many people live with you: _____
- Number of children: _____

6. You are:

- Catholic
- Protestant
- Muslim
- Buddhist
- Atheist
- Agnostic
- Some other religion (specify) _____

7. Educational qualifications:

- No title
- Primary School
- Junior high School (from age 11 to 14)
- Secondary-School certificate (3 Years)
- Secondary-School certificate (5 Years)
- Bachelor's degree
- Master's degree
- PhD

8. Please indicate your level of agreement or disagreement with the following statement using a 10 level scale:

Completely disagree Completely agree

↓ ↓

Generally speaking, people can be trusted 1 2 3 4 5 6 7 8 9 10

9. How well would you say that you are doing financially these days?

- You would say that:
- You live in a comfortable way
- You live in an acceptable way
- You are in difficulty
- You can barely get by

10 If you won this lottery, you would like to receive: 100€ in 3 months 145€ in 6 months
