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Peer effects in the demand for housing quality ☆

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ABSTRACT

Using detailed data on friendship networks within neighborhoods, we investigate the importance of social interactions in one's own residential neighborhood in the demand for housing quality. We find evidence consistent with the presence of peer effects, especially for households living in urban areas. Our findings are in line with the prediction of a model where conformity preferences underlie economic outcomes that involve interactions with peers.

1. Introduction

There is an increasing recognition in economics that social interactions play a major role in explaining a range of individual behaviors, as well as the individual's valuation of both the decision and the resulting outcome.[1] Peer effects have been indicated as important determinants of behavior in a variety of contexts. Examples include education, crime, labor market, fertility, obesity, productivity, participation in welfare programs, risky behavior, to mention a few (for surveys, see Glaeser and Scheinkman, 2001; Moffitt, 2001; Durlauf, 2004; Ioannides and Loury, 2004; Jackson, 2008; Ioannides, 2012). In many social phenomena peer effects stems from preferences for conformity. Conformism is the idea that the easiest and hence best life is attained by doing one's very best to blend in with one's surroundings, and to do nothing eccentric or out of the ordinary in any way. In an economy with conformity preferences peer effects are viewed as a social norm and individuals pay a cost from deviating from this norm. Different aspects of conformism and social norms have been explored from a theoretical point of view. To name a few, (i) peer pressures and partnerships (Kandel and Lazear, 1992) where peer pressure arises when individuals deviate from a well-established group norm, e.g. individuals are penalized for working less than the group norm, (ii) religion (Iannaccone, 1992; Berman, 2000) since praying is much more satisfying the more participants there are, (iii) social status and social distance (Akerlof, 1980, 1997; Bernheim, 1994, among others) where deviations from the social norm (average action) imply a loss of reputation and status, and (iv) crime (Glaeser et al., 1996; Patacchini and Zenou, 2012) where individual wants to minimize the social distance between her crime level and that of her reference group.

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[1] The integration of models of social interactions within economic theory is an active and interesting area of research. See the recent *Handbook of Social Economics* (Benhabib et al., 2011).

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In this paper we study whether conformist behavior affects the individual demand for housing quality. The literature on social interactions in the housing market is extremely limited (see Ioannides, 2012 for a critical survey)[2] and presents two important challenges: (i) to disentangle peer effects from neighborhood effects and (ii) to explain *how* peers influence each other, i.e. the mechanism generating such social interactions.

The study of peer effects in housing decisions is paramount for policy purposes. One of the reason suggesting government intervention in the housing market is inefficiency in housing consumption. Housing renovations improve not only one's own property but also neighbors' property values. However, this externality is not internalized in the individual's calculation of whether or not to undertake an improvement. As a results, the marginal social benefits of the improvement exceed the private marginal costs, and the property owner is likely to invest less than a socially efficient amount. Under this perspective, the existence of peer effects could overcome the underprovision of local public goods (Rosen, 1985).

Our analysis uses detailed data on friendship networks to measure peer groups more precisely than previous studies and elaborates on a conformism model, presented by Patacchini and Zenou (2012), to guide the interpretation of the results.[3] More precisely, borrowing from Patacchini and Zenou (2012), we first present a social network model of peer effects that show how conformism affects the demand for housing quality. We then take the model to the data by using the U.S. National Longitudinal Survey of Adolescent Health (AddHealth). This data contains unique information on friendship relationships among a representative sample of students from U.S. high school teenagers together with residential neighborhood identifiers. The survey design also includes a questionnaire administered to the interviewers which collects information on the type and quality of the respondent's residential building and area of residence. These questions are thus informative of each student's household decisions about house maintenance, repair and renovation. Under the assumption that the children's social contacts in the neighborhood are a good approximation of their parents' social contacts, these data are thus able to shed some light on the importance of social interactions in the demand for housing quality.

Empirical tests of models of social interactions are quite problematic. The issues that render the identification and measurement of peer effects quite difficult are well known: (i) reflection, which is a particular case of simultaneity (Manski, 1993) and (ii) endogeneity, which may arise for both peer self-selection and unobserved common (group) correlated effects.

In this paper, we exploit the architecture of social networks to overcome this set of problems and to achieve the identification of endogenous peer effects. More specifically, in social networks, each agent has a different peer-group, i.e. different friends with whom each teenager directly interacts. This feature of social networks guarantees the presence of excluded friends from the reference group (peer-group) of each agent, which are, however, included in the reference group of his/her best (direct) friends. This identification strategy is similar in spirit to the one used in the standard simultaneous equation model, where at least one exogenous variable needs to be excluded from each equation. In addition, because we observe precise patterns of social interactions, we can include network fixed effects in the empirical specification of the model. By doing so, we are thus able to disentangle peer effects from the presence of network unobserved factors affecting both individual and peer behaviors. Such factors might be important omitted variables driving the sorting of agents into networks. The application of this strategy in our context is based on the key premise that the children's social contacts in the neighborhood are a good approximation of their parents' social contacts. Indeed, the decisions about home repairs, maintenance and upkeep are taken by the parents. Evidence in support of the validity of this strategy is provided.

Our findings reveals statistically significant peer effects in the individual demand for housing quality. The analysis of peer effects is, however, a complex issue and our analysis has some limitations. First, our model is only one of the possible mechanisms generating such externalities. It is not, however, rejected by our data and it serves to highlight the importance of non-market interactions in explaining individual demand for housing quality. Second, in the absence of experimental data, one can never be sure to have captured all the behavioral intricacies that lead individuals to associate with others. In addition, our data provides an imprecise measure of the demand for housing quality. Finally, our friendship networks may be measured with error – we assume that the children's social contacts in the neighborhood are a good approximation of their parents' social contacts. Nevertheless, by using both within- and between-network variation and by taking advantage of the unusually large information on teenagers' behavior provided by our dataset, our analysis is a valid attempt to overcome the empirical difficulties.

The rest of the paper unfolds as follows. In the next section, we present the theoretical framework that helps us to understand how social contacts can influence individual demand for housing quality. Section 3 describes the data and the empirical strategy. We present our empirical results in Section 4, whereas Section 5 contains some robustness checks. Finally, Section 6 concludes.

2. Theoretical framework

Following Patacchini and Zenou (2012), we present a social network model of peer effects with conformity preferences for the demand of housing quality.

There are $N = \{1, \ldots, n\}$ individuals in the economy distributed among K networks. Let n_k be the number of individuals in the kth network, so that $N = \sum_{k=1}^{K} n_k$.

2.1. The network

The adjacency matrix $\mathbf{G} = [g_{ij}]$ of a network k keeps track of the direct connections in this network. Here, two players i and j are directly connected (i.e. best friends) in k if and only if $g_{ij,k} = 1$, and $g_{ij,k} = 0$, otherwise. Given that friendship is a reciprocal relationship, we set $g_{ij,k} = g_{ji,k}$.[4] We also set $g_{ii,k} = 0$. The set of individual i's best friends (direct connections) is: $N_i(k) = \{j \neq i | g_{ij,k} = 1\}$, which is of size $g_{i,k}$ (i.e. $g_{i,k} = \sum_{j=1}^{n} g_{ij,k}$ is the number of direct links of individual i). This means in particular that, if i and j are best friends, then in general $N_i(k) \neq N_j(k)$ unless the graph/network is complete (i.e. each individual is friend with everybody in the network). This also implies that groups of friends may overlap if individuals have common best friends. To summarize, the *reference group* of

[2] Most notably, Ioannides and Zabel (2003) consider the housing demand for a group of neighbors as a system of simultaneous equations. Ioannides and Zabel (2008) develop a model of housing demand with neighborhood effects and of neighborhood choice as a joint decision. Rossi-Hansberg et al. (2010) provide evidence that in neighborhoods targeted by the a revitalization program, sites that did not directly benefit from capital improvements nevertheless experienced considerable increases in land value relative to similar sites in a control neighborhood.

[3] The constraints imposed by the available disaggregated data force many studies to analyze peer effects at a quite aggregate and arbitrary level, such as at the neighborhood level (see, e.g., Durlauf, 2004; Ioannides and Topa, 2010; Ioannides, 2011).

[4] This is not an important assumption since all our theoretical results hold even when $g_{ij,k} \neq g_{ji,k}$. We discuss this issue in Section 5.