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April 27, 2016

Teachers Teaching Teachers: The Role of Networks in Financial Decisions

Nearly every homeowner goes through the process of refinancing a mortgage at least once, and usually several times. The process itself can be rather daunting, especially for someone experiencing it for the first time. Determining the optimal time to refinance, the best lender to refinance with, and the best mortgage product to refinance into are all fairly complicated decisions, even for a research economist like me who studies housing and mortgage markets for a living.

Fortunately, in my case, I was able to draw on the experiences of an older relative who had refinanced numerous times and was willing to provide advice and, more importantly, a referral to a fantastic mortgage broker. The importance of social networks and peer effects in the refinancing decision is something that many housing economists have long believed in, largely based on anecdotal evidence. Now, a new study has come out that confirms this belief using a unique data set of school teachers and a novel empirical design that cleanly identifies the influence of peer effects on refinancing decisions. The paper, titled "[Teachers Teaching Teachers: The Role of Networks on Financial Decisions](#)," is written by Gonzalo Maturana (Emory) and Jordan Nickerson (Boston College). It was presented at a housing finance conference that our very own [Center for Real Estate Analytics](#) held in New Orleans back in December (a copy of the agenda and links to the presentations are available [here](#)). In addition, I recently discussed the paper at the Midwest Finance Association meetings held in Buckhead last month (a copy of my discussion slides can be found [here](#)).

One of the main innovations in the paper is the data set that the authors compile. They start with administrative data on public school teachers in Texas. These data contain detailed demographic information, employment information (the school district and school where each teacher works and the exact employment dates), and, most importantly, information on each teacher's daily class schedule.

For example, the authors know the exact time of the classes that each teacher is scheduled to teach as well as the exact timing of all teachers' break periods. The teachers' data are then matched to a public voting records database in order to obtain the exact street addresses of the teachers' places of residence. Finally, armed with the street addresses, the authors are able to merge the data with public property records. The property records come from county deed registries in Texas and contain detailed information on property transactions (addresses, names of the buyers and sellers, and property characteristics obtained by tax assessors) as well as information on every mortgage that is originated in the state (the type of mortgage—purchase or refinance, the loan amount, the interest rate type—fixed or adjustable, and the identity of the lender). Thus, the authors are left with a data set that contains detailed information on the refinancing decisions of Texas public school teachers (the timing of the refinances, characteristics of the loans, and the identities of the lenders), and detailed information on the employment history and status of the teachers including the exact campus where each teacher works, and the exact daily schedule that each teacher follows.

Armed with this unique data set, the authors implement a strategy to test whether one teacher's decision to refinance influences other teachers' refinancing decisions who are part of that teacher's same "peer group." The term "peer group" typically refers to the group of people that an individual interacts with on a frequent basis and thus, whose economic or financial decisions are most likely to influence those of the individual. There are two major challenges that this study along with every other empirical study on social interactions and peer effects must confront with respect to peer groups. The first challenge is determining exactly what constitutes a given individual's "peer group" in a particular context, and then identifying those groups in the data. The second challenge is finding peer groups that an individual is *randomly* assigned to rather than groups that an individual explicitly chooses to join. This latter challenge is especially crucial, but very difficult to overcome in a non-experimental setting, as

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individuals typically choose which groups to associate with and the factors that determine those choices are often unobservable to the researcher and hence, can lead to severe omitted variable bias that conflates inference.

In Texas, teachers apply for jobs in a specific school district, but then are more-or-less randomly assigned to specific schools within the district. Therefore, one teacher peer group that the authors consider in the paper is the set of teachers who work in the same school. This peer group is rather large, however, so it is unclear how much interaction actually occurs between teachers in the same school. To address this issue, the authors use their detailed information on teacher schedules and identify groups of teachers in the same school that have significant overlap in their respective break schedules (at least 40 minutes of overlap in off-periods each day). The idea is that if two teachers are on break together fairly often, then it is more likely that they will directly interact with each other and discuss aspects of their lives including their financial decision making. This is a particularly compelling strategy because teachers often spend their break periods in the faculty lounge, near other teachers on break, which maximizes the potential of significant social interaction.

Using this detailed information on teacher schedules and the data on mortgage refinancing from the property records, the authors define their main variable of interest to be the number of teachers with significant overlap in break periods (at least 40 minutes per day) who have refinanced their mortgage debt within the previous three-month period. They then estimate a regression to determine whether an individual teacher's choice to refinance is influenced by the number of teachers in her peer group who had previously refinanced their mortgages. The results show that this indeed the case. Specifically, a one standard deviation increase in the percentage of a teacher's peer group who refinanced their loans with the previous three months is found to increase the likelihood that an individual teacher in the peer group refinances his or her loan by around 6.5 basis points. While 6.5 basis points does not sound like a large amount, it corresponds to almost 10 percent of the unconditional monthly hazard of refinancing in the data (which is approximately 56 basis points), so the effect is nontrivial.

In addition to testing whether increased refinancing by a teacher's peers influences that teacher's own decision to refinance, the study looks at whether there is a tendency for teachers within the same peer group to use the same lender. This is a natural extension since it would seem likely that during the course of discussing their refinancing experience with each other, teachers would share the identity of and their personal experience with the lender. We also know anecdotally that referrals are a large source of business for mortgage brokers. Sure enough, the authors find that teachers within the same peer group use the same lender to refinance at a significantly higher rate than would be the case if simple random chance were driving lender decisions. On average, teachers within the same peer group use the same lender approximately 8.2 percent of the time. Assuming a world in which there were no peer effects in refinancing behavior, and lenders were chosen randomly, teachers within the same peer group would be expected to use the same lender roughly 3 percent of the time. This difference is highly statistically significant, suggesting that teachers within the same peer group share their lender experiences and refer those lenders with whom they have had good encounters.

Broadly speaking, the results in the paper appear to confirm our belief that people tend to seek and receive advice on major financial decisions from individuals within their social network. In particular, determining the optimal time to refinance a mortgage and the best lender to perform the refinance with are complicated decisions with potentially large consequences, as mortgage debt accounts for the majority of total outstanding debt for many U.S. households.

While I find the results of the paper fairly convincing and believe the authors have implemented a very careful analysis, there is an important and open question of external validity. That is, should we generalize these results to other types of individuals besides just public schoolteachers in Texas, who, it turns out, are predominantly female and highly educated (approximately three-fourths of the sample has at least a bachelor's degree)? This is always an issue with studies that do not use a representative sample of the population, but in this case, there are huge advantages that the data set provides in facilitating the analysis of peer effects on refinancing behavior, which I think dominate the drawbacks of not having a representative sample.

By Kris Gerardi, financial economist and associate policy adviser at the Federal Reserve Bank of Atlanta.

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