**Model Description**

The researchers developed a diffusion model that aims to capture the diffusion process of participation in a microfinance program at the household level.

The structure of the diffusion model can be explained as follows:

1. A set of initial leaders (injection points) is informed of the microfinance program. These leaders are generally pre-school teachers, shopkeepers, and saving self-help group leaders

(Banerjee et al., 2012, p.12)

1. Leaders get to decide if they wish to participate (Banerjee et al., 2012, p. 12)
2. In each period, households that have been informed pass the information independently to each of their neighbors with probability (q), which varies depending on a household participation status. (Participant qP or non-participant qN) (Banerjee et al., 2012, p.12)
3. Newly informed households decide whether to take part depending on their characteristics and previous participation decisions of their neighbors who passed the information to that household (Banerjee et al., 2012, p.12)

The model repeats the same procedures and terminates after several periods of information passing.

Information Model :  =α + Xi’β

Information with endorsement Model: =α + Xi’β + λFit

(Banerjee et al., 2012, p. 21)

People who are informed but not eligible or have no intention to participate can still pass the information around. The effect of those non-participants is also examined in the study. The baseline model is the simple information model which only incorporates information transmission. Another information model enriched with the endorsement effect incorporates peer influence. The model accounts for the endorsement effect by allowing a households’ decisions to participate to depend on what their neighbors have done.

**Model Estimation**

Two diffusion models are estimated in the study: a baseline information model and an information model with an incorporated endorsement effect that accounts for peer influence. The models are estimated structurally with the use of Method of Simulated Moments (MSM) (Banerjee et al., 2012, p.29).

The key moments considered in the models are:

1. The share of leaders who participate in the microfinance program (Banerjee et al., 2012, p.21)
2. The share of households who participate with no participating neighbors, the share that participates with a neighboring participating leader, and the share that participates that lives in the neighborhood of a non-participating leader (Banerjee et al., 2012, p.21)
3. Covariance of the fraction of households participating in the program with the share of their neighbors that participate or with the share of their second-degree neighbors that participate (Banerjee et al., 2012, p.21)

The information diffusion process is simulated with the use of various selected parameters. The parameters chosen aim to best match the key moments predicted by the model with actual moments observed in the village. Model estimation is carried out in three steps. For each set of moments, estimate β first through logistic regression using the participating decisions amongst the informed leaders. Parameters λ, qN and qp are then estimated by searching through the entire set of parameters and running the simulation 75 times (Banerjee et al.,2012, p.29). Moments are calculated at each simulation before averaging out the 75 runs and selecting parameters that minimize the function consisting of the difference between moments observed in the data and those predicted by the model for each village.

The modeling results suggest that information effects are far more significant than peer influence. A household’s decision to participate is not significantly affected by its peers and no additional endorsement effects exist beyond information passing. Even though participants in the microfinance program are approximately five times more likely to pass information along to their friends than nonparticipants, non-participants still play a substantial role in information transmission. Overall, the model replicates the actual observed pattern of information transmission in these villages.

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Fit: a fraction whose denominator is the no. of i’s neighbors who informed i about the microfinance program and the numerator is the no. of those who participated in the program

λ: change in the log - odds ratio of household i participating because of a change in the fraction of neighbors who informed i that decided to participate

β: a vector of coefficients that describe how the log-odds ratio of participation varies with characteristics Xi

Xi: is a vector of individual characteristics and F is the fraction of informed neighbors who participate.

qN: Probability of informing a given neighbor from a non-participant

qP: Probability of informing a given neighbor from a participant

**Reference**

Banerjee, Abhijit et al. *The Diffusion Of Microfinance*. 1st ed. Cambridge, Massachusetts: National Bureau of Economic Research, 2012. Print.