Adi Jahić
PhD Student
Department of Economics
Brown University

Incentives In Networks with Redistributive Pressures and Endogenous Incomes

1 Background and Motivation

In developing countries, the network spillover effects of financial decisions are particularly acute (Fafchamps, 2003). Due to income uncertainty and widespread lack of access to formal credit institutions, many social networks engage in informal risk sharing, transfers of cash or in-kind gifts between friends and neighbors, to insure against risk, make large purchases, and facilitate redistribution (Banerjee and Duflo, 2007; Fafchamps, 2011).

Previous work has shown that, with perfect information and exogenous incomes, partial risk sharing arrangements can be sustained and be beneficial when a game is repeated and incomes are sufficiently uncorrelated (Ligon et al., 2000, 2002). In other words, people can be made better off by giving when their income is high with the implicit promise of receiving a future transfer when their income is low. The lack of full risk sharing in the data has previously been explained by imperfect commitment (Ligon et al., 2002), but the level of risk sharing becomes more complete with altruism (Foster and Rosenzweig, 2001).

However, this theoretical literature does not consider the efficiency concerns of these arrangements. With imperfect information over labor supply and investment decisions, these arrangements can lead to distortions. In fact, evidence suggests that village economies more closely resemble a "private information" economy rather than a "permanent income" economy (Ligon, 1996). A growing empirical literature argues redistributive pressures have been shown to lead earners to hide income from their network, to increase demand for illiquid assets, and discourage entrepreneurship (Jakiela and Ozier, 2016; Alby et al., 2020; Carranza et al., 2022; Squires, 2024).

2 Contribution

Since changes in the income of one's social network implies a change in one's access to credit (in the form of either gifts or loans), we would expect these income shocks to a networks member to spillover throughout the network. When information is imperfect these spillover effects might alter incentives, thus leading to unexpected results. This study is the first to estimate exactly how these spillover effects impact labor supply, risk behavior, and marginal propensity to consume throughout a network.

Thus, the goal of this pilot is three-fold. First, we plan to estimate beliefs over how one's access to credit changes when a network member's income is shocked and beliefs over how one's demand provide credit changes when their own income is positively shocked.

An implication of imperfect information is that people may have incorrect beliefs about their access to credit (or demand to provide credit). If people underestimate their access to credit, they may under-invest in capital intensive assets. On the other hand, overestimation of access to credit may artificially increase one's marginal propensity to consume or lead to more than optimal risk taking.

Second, this study will measure how a change in one's access to credit impacts their labor supply and risk behaviors, and how this varies by their social proximity to the shocked network member and by the observability of their actions. By comparing respondents whose access to credit is shocked with respondents whose own income is shocked, we can control for the income effect to see how the source of credit itself impacts behaviors. If we see, for example, that access to credit leads to lower effort and a non-positive change in risk behavior, one could argue that redistributive pressures are inefficient due to distorted incentives.

Third, this study will disentangle the motivations behind gifting by distinguishing between altruism, social pressures/fear of ostracism, and financial returns (in the form of receiving gifts when in the "bad state"). This will lead to a better understanding of how the existence of this norm impacts well-being of givers; altruistic giving has vastly different implications on well-being and efficiency than giving due to fear of punishment.

3 Experimental Design and Structural Model

The lab-in-the-experiment consists of a simple baseline survey, a lab experiment, and a follow-up survey. The baseline survey asks questions about recent consumption, income, investment, and informal transfer history. It also asks demographic questions (age, marital status, etc.), social networks, and transfer history.

For the lab experiment, we create random pairs of subjects who are in linked to one another in their social network. The pairs are anonymous ex-ante. We then designate one player to be player A and the other to be player B. Player A is told that they may receive a sum of four different possible sizes (10,000 UGX, 100,000 UGX, 250,000 UGX, or 500,000 UGX). Player B is told that their partner may receive these sums. Both players are told that their partner may be a family member, close friend, or acquaintance. Thus, there are 12 possible states; 4 different payment sizes and 3 different possible social proximities. For player A, we then elicit how much he would give to B given all the possible states by informing them that their answer for the "true state" will be implemented later in the game. In order to disentangle the motivations behind gifting, we also vary whether the transfer will be made private or not. For player B, we similarly elicit how much he expects A to give him, incentivizing him to make as accurate a guess as possible.

Afterwards, we elicit player B's labor supply preferences for each of the above possible states by allowing him to choose the amount of a task he would like to complete when there is a piece-rate for completed tasks and a penalty for uncompleted tasks. We also elicit their risk behavior via their preferences for lotteries given every possible state. At the end of the game, we inform the players of true state and observe player B's true labor

supply decision.

Later, we conduct follow-up surveys to see how transfer behavior and consumption across the network changes.

With this experiment, we can get a better understanding of the impact of redistributive pressures across a networks. Building on the Fafchamps and Gubert (2007) and Ambrus et al. (2014) models by relaxing the assumption of perfect information and the assumption of exogenous income paths and using the results of the above experiments, we can estimate how income shocks impact well-being throughout a network for different network structures and for different locations of the shock (where location refers to the node(s) of the networks that is shocked). This model will provide insight on the network structures for which redistributive pressures are most efficient, and provide insight on which nodes "should" be positively shocked given a certain network structure.

4 Policy Implications

This work has important implications on policy in Uganda, where such redistributive pressures are common.

First, it may have implications on labor markets and investment behaviors. In Uganda, as well as other Sub-Saharan African countries, there are relatively large amounts of slack in labor markets. An explanation for this is that it may be individually rational for workers to reduce their labor supply and instead ask for transfers from higher earning network members. Understanding this effect can inform policy that looks to reduce this slack and reduce underemployment.

Similarly, understanding the relationship between increases in access to informal credit and investment/risk behavior can have important implications for an economy looking to increase investment and entrepreneurship by households. If informal credit networks induce more investment than non-networked-based credit, policy may benefit from exploiting existing credit networks rather than introducing more formal credit. This is especially important since there is evidence informal and formal credit are substitutes (Banerjee et al., 2024).

This study can also inform optimal targeting of cash transfer or loan programs, such as the PDM, especially when income levels are difficult to determine. When providing cash tranfers/loans to subsets of a social network, there are bound to be spillover effects. Understanding how to maximize the benefit of these spillovers while minimizing the efficiency costs can make cash transfers far more effective at increasing well-being at the network level.

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