Enhancing well-being at the bottom-of-the-pyramid with Nano-finance plus(+)

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From micro-finance to nano-finance(+)

Do you know what savings groups are? Imagine extremely poor people, people living in a rural or peri-urban area of a developing country—people so poor that they do not even qualify to be micro-credit clients. They still have to confront health emergencies and need small loans to take advantage of income-generating opportunities, so what do they do? They create a *savings group*.

In a savings group, individuals without access to financial services form a group with other persons in the same situation and then start to accumulate their savings into a common monetary fund, which is kept in a metal box with three padlocks. The group members later use the fund to provide loans and informal insurance to themselves. Loans are normally used to smooth consumption or to start a small retail business, while the informal insurance covers life cycle events like births, health problems or funerals.

I call *nano-finance* to the dynamics of savings groups that carry on their activities at the bottom-of-the-pyramid. I believe nano-finance is different from micro-finance because nano-finance is based on a demand-driven, self-managed and self-financed grass-root association that is created from and for the communities. Micro-finance in turn is a formal and supply-driven provision of financial services, from

institutions to the vulnerable or the poor; in nano-finance, in contrast, the *extreme* poor form a group to provide informal financial services to themselves.

Governments, international donors and development organizations work closely with savings groups due to the power of nano-finance to reach the poorest of the poor in developing countries. Some of the donors and non-governmental organizations (NGOs) working with nano-finance groups are the Inter-American Development Bank, the Bill & Melinda Gates Foundation, CARE or Oxfam International.

NGOs help communities to create nano-finance groups and use the groups as a platform to provide plus(+) programs to households. The plus(+) interventions facilitated by NGOs support diverse social goals, like literacy, financial education, health and sanitation, child nourishment, women-empowerment, business training and even agricultural policies adapted to climate change.

Development agencies have created their own facilitation models in an effort to improve the impact of nano-finance(+). Each agency applies different types of interventions, depending on their goals. But does the type of facilitation model makes a difference? What are the most frequent plus(+) interventions provided to nano-finance groups and which interventions are the most effective? Overall, what are the best policies to encourage the sustainability of nano-finance groups?

The sustainability of nano-finance(+): research-based evidence

Sustainability in nano-finance guarantees financial inclusion and development. When nano-finance groups are sustainable, they provide a continuous source of financial services for the poor and ensure the

long-term implementation of social interventions, even after a development agency stops working with the groups and leaves a community.

In our research project, funded by the FAHU foundation, we use data-mining and machine learning methods to explore a large sample database of savings groups —the SAVIX—, in order to identify the best possible policies to enhance the financial sustainability of nano-finance groups worldwide.

The SAVIX is a large sample database with quarterly observations of more than 250000 nano-finance groups in 52 countries around the world. Half of the groups in the SAVIX are located in Africa, mainly in Uganda (22702 groups), Tanzania (21374 groups), Mali (21021 groups), Burkina Faso (13680 groups), Ghana (12337 groups), Mozambique (10244 groups) and Senegal (10148 groups). There is a high prevalence of nano-finance groups in Africa, because indigenous groups —as the *esusu* in West Africa or the *ikilemba* in Central and East Africa— were already working in that continent before the intervention of development agencies.

So, what about data-mining and machine learning? Why we choose to apply these techniques to the SAVIX?

Data-mining and machine learning are mathematical and statistical methods that allow to extract knowledge from big databases. Instead of estimating one single regression that could be misspecified, data-mining and machine learning allow us to explore the whole SAVIX database with thousands of different mathematical models.

By applying data-mining and machine learning to the SAVIX, we identify which variables affect the returns on savings generated by nano-finance groups. Returns on savings are remarkably relevant for

nano-finance, because groups that generate returns have a motivation to keep operating over time and hence are a sustainable source of social and financial services.

Our findings show that the type of facilitation model and the different interventions of NGOs have a strong impact on the returns generated by sustainable nano-finance groups.

NGOs apply a default nano-finance model to new groups that are starting their operations in a village. This default model prescribes 15 to 25 members per group, weekly meetings, an operational cycle of 9 to 12 months and the integration of social development programs aligned with the targets of the NGO. We found that agencies that start with the default nano-finance model but let the groups 'graduate' and experiment with innovations, like digital savings, promote higher returns and thus encourage financial sustainability.

In terms of development interventions, our findings indicate that education, income-generating activities and health programs are the most frequent interventions implemented by development agencies. Business training is not among the most frequent intervention applied in nano-finance, but it is in fact the most important social program to enhance financial sustainability.

Our results have strong implications for governments, donors and international development organizations interested in using nano-finance(+) as a platform to promote sustainable finance and multi-dimensional poverty reduction at the bottom-of-the-pyramid. In the practice, our results indicate that a too stringent supervision model may be hindering groups from growth, and hence it is important to let members of nano-finance groups to experiment with innovations to achieve their social and economic goals.

Instead of prioritizing social programs aligned with the aims of NGOs, development organizations can improve the financial performance of nano-finance groups by encouraging members to take their own informed decisions, based on their aspirations and their needs. Our research-based evidence indicates that these strategies will guarantee the financial sustainability of nano-finance groups, and thus will promote long-term well-being in impoverished communities around the world.