

Reducing Poverty Risk in Developing Countries

Project No.	Project Title	Project Leader
1	Dynamic poverty measurement	Klasen, Krivobokova
2	Measuring vulnerability to poverty	Kneib
3	Maternal and child health and poverty risk	Vollmer
4	Risk, investment, and poverty: Dynamics of micro and small firms in developing countries	Lay
5	Informal risk sharing networks as a strategy to reduce poverty risk	Ibanez
Project Leader	Faculty, Department (all University of Göttingen)	Institute
Klasen	Faculty for Economic Sciences, Department for Economics and Courant Research Center for Poverty, Equity, Growth	Development Economics
Krivobokova	Faculty for Mathematics and Computer Science, Department for Mathematics and Courant Research Center for Poverty, Equity, Growth	Mathematical Stochastics
Kneib	Faculty for Economic Sciences, Department for Economics and Courant Research Center for Poverty, Equity, Growth	Statistics
Vollmer	Faculty for Economic Sciences, Department for Economics and Courant Research Center for Poverty, Equity, Growth	Development Economics
Lay	Faculty for Economic Sciences, Department for Economics, and GIGA (German Institute of Global and Area Studies, Hamburg) and Courant Research Center for Poverty, Equity, Growth	Development Economics
Ibanez	Faculty for Economic Sciences, Department for Economics. Courant Research Center for Poverty, Equity, Growth	Development Economics

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Research Program

Summary

English Summary of overall program

Despite substantial progress in reducing poverty in many parts of the developing world over recent decades, large parts of the population in many countries continue to be highly vulnerable to poverty. This results, on the one hand, from their incomes still being very close to the poverty line, but also from their living and working in very risky environments. They are exposed to high health risks with few options to mitigate these risks (as the current Ebola epidemic in West Africa vividly demonstrates); they face production, price, and market risks as producers in farms and firms, and they face employment risks as workers. While many can rely on private transfers and solidarity in case of shocks, these private safety nets are not reliable or sufficient. As a result, even if their average income-earning opportunities have improved, they can easily fall into poverty if hit by some of these shocks. Understanding and modelling the nature of these risks, the impact they have on poverty trends for different groups in different countries, and policy options to mitigate them is therefore at the forefront of a research-based policy agenda for sustainable poverty reduction in developing countries.

The aim of this interdisciplinary research programme is to bring together development economists, health economists, experimental economists, and statisticians to advance our understanding of poverty risks. It will examine the drivers of poverty risks with a particular focus on how risks and shocks affect poverty outcomes; how households, firms, and communities try to mitigate these risks; what the benefits and costs of these mitigation strategies are; and what policies can reduce poverty risks.

The proposal consists of five projects that each deal with a particular aspect of this research agenda. Two methodological projects are focused on modelling and analysing poverty dynamics from an *ex ante* as well as an *ex post* perspective. Three applied projects will then examine poverty risk with a focus on assets (in particular health), returns on assets (for small producers) as well as risk-coping

strategies in communities (solidarity and transfers). At the same time, there will be substantial collaboration between the projects to develop this common research agenda, which builds on substantial prior collaboration of the principal investigators in the context of three DFG-Research Training Groups and the Courant Research Center 'Poverty, equity, and growth in developing and transition countries.' This collaborative research programme aims to form the core of a proposed DFG Collaborative Research Center application in the medium term that would extend and enhance the research program proposed here.

Project 1: Dynamic Poverty Measurement (Klasen, Krivobokova)

Despite decades of debates and academic and policy analyses on poverty measurement, there continue to be major research gaps that recently have gained renewed urgency. Of particular importance is how to measure and analyze poverty using a dynamic perspective. In our project, we will first focus on the relationship between growth, inequality, and income and non-income poverty reduction (using repeated cross-section and panel data). Here growth incidence curves (which plot growth rates by percentiles of the income distribution) have been used to determine the distributional pattern of growth, and thus the effect of growth and distribution on poverty reduction. Using these curves as the basic analytical tool, the aim of this part is to investigate statistical inference issues, the study the distributional pattern of income versus non-income growth, apply it to repeated cross-sections versus panel data, and assess how risks and shocks in affect the distributional pattern of growth and poverty reduction.

A second aim of the project is to further develop internationally comparable dynamic multidimensional poverty measurement. One direction will be to develop an internationally and inter-temporally comparable indicator that can measure multidimensional poverty at the individual level, and compare this to household-based poverty measurement (using income and non-income perspectives); this will be of particular relevance for measuring gender gaps in poverty as well as inequality among the poor across the developing world. A second direction will be to consider ways to incorporate relative considerations in an assessment of trends in multidimensional poverty.

Project 2: Measuring Vulnerability to Poverty (Kneib)

Vulnerability with respect to a specific event can informally be understood as the risk of experiencing this particular event in the future given the current situation of the person. More specifically, vulnerability may relate to individual or household income and the risk of falling below the poverty line but can also be understood more generally, e.g. in the context of the risk of small or medium enterprises to fail. Vulnerability in any context usually depends on characteristics of the individual under study and its past risk experience. Measures of vulnerability should therefore be derived from panel data and cannot be constructed adequately from cross sectional data alone. To simplify the presentation, we will discuss vulnerability in the context of individual income poverty in the following, although the developed methods and concepts will be used more broadly in the context of this project.

To derive measures of vulnerability to poverty, predictions of future income can be obtained with panel regression techniques and vulnerability is then operationalized based on an appropriate comparison of the implied predictive distribution with the poverty line or a different suitable threshold. However, most panel regression techniques available for constructing predictions focus exclusively on the expected income or combinations of expected income and variability of the income, but do not take into account that vulnerability may also strongly be related to other features of the predictive distribution. For example, two individuals with the same predicted expected income and variability may have very different predictive distributions especially in terms of skewness and/or kurtosis.

In this project, flexible approaches for constructing predictive distributions will be studied that overcome the limitations of pure location or location-scale models. This will allow us to make much more reliable predictions about the future vulnerability and to acquire a deeper understanding of the way how specific individual properties impact vulnerability. For determining flexible predictive distributions, we will consider completely distribution-free approaches such as quantile and expectile regression or conditional transformation models, as well as parametric regression models such as generalized additive models for location, scale and shape where a distributional assumption is kept for

the response variable of interest but several distributional parameters are related to regression predictors. In addition to improving predictions, distributional regression models beyond location or location-scale regression also provide the basis for constructing new measures for vulnerability to poverty. Furthermore, we will study questions of data quality and minimal requirements for making reliable predictions of vulnerability to poverty based on panel data information.

Project 3: Maternal and Child Health and Poverty Risk (Vollmer)

Health and poverty are strongly negatively correlated. Poor people are sick more often, and people with poor health are often poor. Especially child health is a major concern for development economists as there are long-term consequences for health in adulthood and associated poverty risk. Investments in child health made during critical periods of child development result in large returns in terms of health, well-being and economic opportunities as adults. Conversely, failure to invest can lead to severe long-term economic consequences at both the household and macro-economic level. More than half of all child deaths occur during the first month of life and particularly the first 24 hours are a very critical period for mother and child. Improving maternal and child health outcomes is among the top priorities of global health and development policy. In 2012, worldwide 6.6 million children under five years died as a result of largely preventable causes. Further reductions of child mortality crucially depend on improvements during this critical period of life, which mostly depend on safe childbirth as well as pre- and postnatal care.

We plan to study a comprehensive set of health interventions covering pre- and postnatal care as well as the birth process itself. Such programs have a high potential in enhancing mother's and children's health outcomes and thus generate positive long-term micro- and macroeconomic development effects. The mothers' decisions and behavior towards health interventions are crucial for the children's long-term health outcomes. Hence, it is highly important to focus on them and their health education before the child is born.

Antenatal check-ups are often the first contact for the pregnant women with a formal health system and might strongly influence their later health behavior and hence, the health of their child. Already during the pregnancy the health of the baby can be enhanced by micronutrient supplementation, immunization of the mother or certain behavioral patterns adapted by the mother. Thus, antenatal check-ups are the first move to influence the child's health and should be strategically used as such. New telecommunication technology provides an interesting tool to do so especially in rural, remote areas.

Safe childbirth could prevent the majority of maternal and newborn deaths. While shifting place of delivery from home to hospital is a key strategy for improving childbirth outcomes, the poor quality care during births, also in institutional settings, remains a major contributing factor to easily preventable maternal and newborn harm. Those are often due to easily preventable causes, like infections or excessive bleeding. Inadequate hygienic conditions in the health institutions and low expertise of the health personnel reinforce those deficiencies. The WHO Safe Childbirth Checklist is a potentially very cost-effective tool for reducing mortality of newborns and mothers in low-income and middle-income countries. Checklists bundle essential tasks into a practical format consisting of actionable items and help the users to remember essential complex or neglected tasks. Integration of checklists into clinical practice has been shown to reduce deaths and complications in intensive care medicine and surgery.

Postnatal check-ups form the last part of our comprehensive health study. Basic health education for mothers usually takes place within those regular visits after the birth, including education about the importance of breastfeeding in the first months after birth. Furthermore, the basic immunization of the child will be conducted during those visits and micronutrient supplementation might be provided. As such, long-term development of the child might strongly depend on regular visits at health institutions. After the first six months (during which the child is ideally protected through breastfeeding), safe water and nutrition become the most important health priorities. Not just calorie intake but more importantly the proper intake of (micro)-nutrients is of critical importance during this period.

We will evaluate the effectiveness of pre- and postnatal programs, the WHO Safe Childbirth Checklist and early child health interventions in Indonesia using a mixed methods approach.

Project 4: Risk, investment, and poverty: Dynamics of micro and small firms in developing countries

The main objective of the proposed project is to empirically analyse the dynamics of urban micro and small enterprises (MSEs) and to study specific risks and constraints that these enterprises face. These enterprises are often household-based and their performance directly affects the poverty risks of households. The project will take a vulnerability perspective on firm performance and focus on the lack of productivity improvements and innovation in MSEs. The risk associated with innovation is likely to be a major constraint that prevents MSEs from growing and improving productivity, thereby potentially causing income poverty traps for individuals, groups, and, eventually, entire economies. In many developing countries, MSEs are the main source of non-agricultural employment, but are typically not able to provide productive employment and a decent livelihood for their owners and workers.

Recent empirical work on MSEs has shown that marginal returns to capital stocks in MSEs can be very high if capital stocks are low; yet, they also tend to decline rapidly with rising capital stocks. On the one hand, this might indicate capital scarcity driving high marginal returns initially. On the other hand, the stagnation of many MSEs may be caused by low productivity and the lack of innovation. There is, however, hardly any empirical literature that examines innovation and technology adoption in urban MSEs in low income countries, and the proposed project intends to fill this gap. In the context of this project, innovation is understood in terms of incremental changes, in particular the adoption and the adaptation of existing technologies (often embodied in capital goods), products and processes. We will look into the determinants of innovation and investment, the associated risks and the effects on firm “vulnerability” and productivity.

Entrepreneurial decisions on savings, investment and innovation can be partly explained by behavioural drivers. For example, risk attitudes and time preferences will influence investment and innovation behaviour. While behavioural determinants have been stressed in the context of savings, they have not received much attention in the literature on innovation in MSEs. The project will also address this gap. Specifically, one important assumption of this project is that investment decisions of individual entrepreneurs are driven to a great extent by their belief about their own productivity – or by the belief about how a specific investment or innovation will be affecting their productivity. These beliefs, in turn, are determined by behavioural traits. We therefore propose to indirectly test for the importance of such beliefs by also considering behavioural biases that affect innovation and investment decisions.

The analyses will rely on long-term panel data on MSEs in urban Uganda. With very few exceptions, empirical studies on MSEs rely on short-term data of 1-2 years. This is also why the determinants of growth processes in MSEs through capital accumulation and innovation remain so poorly understood. We can build on an existing 3-year panel dataset that will be extended to a period of six years.

Project 5: Informal risk sharing networks as a strategy to reduce poverty risk (Ibanez)

Poor households are particularly vulnerable to be affected by negative shocks and are the ones who suffer most when hit. In the absence of formal insurance mechanisms, risk sharing networks play an important role mitigating negative shocks. Gifts and transfers are widely used to share risks (Bhattamishra and Barret, 2010). Hence understanding the mechanisms that enable risk-sharing networks to function is important to assess the vulnerabilities that affect the poor, and design mechanisms that foster greater resilience.

This project considers risk and risk sharing networks from two different perspectives. The first part of the project investigates the development of norms of solidarity in children. In particular we consider whether solidarity norms are innate or develop with upbringing. While previous research on risk sharing networks, has documented some degree of risk pooling it is not clear which are the mechanisms that enable this type of informal and non-enforceable contracts to work. While behavioural motivations on risk sharing networks have been studied before (Selten and Ockerfels, 1998, Leider et al. 2009; Ligon and Schechter, 2009), this is, to our knowledge, the first study that

considers how those norms develop in children. Moreover, our experimental design allows us to identify alternative motivations behind solidarity networks such as reputational concerns. Unlike previous studies, this project uses a more realistic experimental setup to simulate shocks. This project builds on on-going research on the topic, where in 2012 we conducted experiments with school children in Bogota. This project will allow broaden and enhance our research on the topic. We plan to conduct experiments with the same subject pool in order to build up panel data. This would allow us to consider within subject variation in solidarity and would enable the use of fixed effects models to control for time invariant unobserved heterogeneity.

The second part studies the relation between solidarity networks and the evolution of social capital. While shocks can have a high economic and human cost, they can also trigger processes of social development. For instance, Bellows and Miguel (2009) and Castillo and Carter (2011) find higher levels of trust in areas that were more affected by wars or natural disasters. They argue that disasters foster people's engagement in community work which results in higher social capital. This suggests that communities learn from the traumatic experience and improve the efficiency in risk pooling. Using laboratory experiments (Ibanez and Dietrich (2013) find that the structure of the shocks affects the development of social capital. This project builds on this research and considers the potential crowding-in or crowding-out effects of social protection programs on the formation of social networks and the development of social capital. Recent empirical literature shows that the introduction of public transfer programs (pensions, insurance programs, cash transfers, etc.) generate crowding out effects on private transfers (Albaran and Attanasio, 2005; Klasen and Woolard, 2009, Woolard, Harttgen, Klasen, 2011). One topic that has not been considered so far is the indirect effects of these programs on social capital. For example, it is not clear whether programs that reduce the possibilities of people to help each other, decrease social interaction and hence affect trust and cooperation. We intend to fill this gap in the research analyzing how experiences of shocks, interacted with the presence of insurance programs, affect the evolution of social capital. If shocks enable people to organize and help each other, and this process increases social capital, do social protection programs reduce those effects? Under which conditions do social protection programs reduce social capital formation? We use an experimental design that compares an environment without social protection programs to one with different social protection programs, including informal insurance mechanisms.