DEGRP Finance & innovation research portfolio

Call 1 & 2 research summaries

July 2016
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Combined in this document are research summaries from DEGRP finance and innovation researchers in attendance at the DEGRP multi-call grant holder workshop on 13 July 2016.

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Politics, Finance and Growth

**Institution:** University of Leicester  
**Principal investigator:** Svetlana Andrianova  
**Research status:** Completed

### RESEARCH MOTIVATION

Although the recent financial crisis led to suggestions that there can be too much finance, many low income countries (LIC) remain financially under-developed. In Sub-Saharan Africa, banks continue to lend little domestically. Even where financial development has taken place, its effects on the poor are generally unknown. By analysing the linkages between politics, finance and growth in Sub-Saharan Africa, the project aims to explain how finance can help promote pro-poor economic growth in LIC.

### RESEARCH QUESTIONS/HYPOTHESES

The project’s main aim was to analyse the linkages between politics, finance and growth with special emphasis in low-income countries, especially in Sub-Saharan Africa, using appropriate theoretical models and empirical evidence. More specifically, we have (i) analyzed the causes of financial under-development in sub-Saharan Africa (ii) re-examined key aspects of the finance-growth relationship (iii) constructed a range of new measures of financial fragility and (iv) shed new light on the relationship between financial development and poverty alleviation using a range of different methods.

### APPROACH AND METHODS

We have used a variety of methods including economic theory and econometrics.

### MAIN FINDINGS (IF APPLICABLE)

1. We have contributed to a better understanding of the blockages in the finance-growth nexus in Africa. Specifically, we have demonstrated that high levels of loan defaults discourage loan supply by banks. We have also examined the determinants of high loan defaults and have shown that besides information imperfections and weak institutions – which are the usual ‘suspects’ when credit markets are functioning poorly - the fractionalization of credit markets along ethnic dimensions plays an important role.

2. We have provided new empirical evidence, which suggests that the relationship between finance and growth has been changing. Specifically, we have shown that: (i) financial depth is no longer a significant determinant of long-run growth; (ii) financial reforms have sizeable growth effects that are not always positive (iii) the effects of financial reforms on growth depend on how well banks are regulated (iv) in many countries in sub-Saharan Africa monetization plays a distinct role in capital accumulation and growth.
3. We have constructed a new database on financial fragility for 124 countries over 1998 to 2012. The (new) International Database on Financial Fragility (IDFF) is freely available to researchers and is accompanied by a 53-page discussion paper that describes its construction, advantages and limitations in some detail. We anticipate that the database would facilitate better understanding of the principal mechanisms through which crises are initiated and propagated. It will also enable new research into the disruptions that financial fragility can create to the finance-growth relationship: fragile banks are unable to support growth because they focus their efforts on deleveraging their balance sheets and strengthening their liquidity buffers in order to cope with deteriorating depositor confidence. We have already established in ongoing work that some of the new measures of financial fragility are good predictors of future crises. Importantly, analysis of the database suggests that financial fragility is most acute in low-income countries. Thus, reducing financial fragility may hold the key to enhancing the impact of financial development on both growth and poverty alleviation.

4. We have also contributed to a better understanding of the relationship between financial development, income inequality and poverty. We have shown, for example, that financial deepening in India contributed to poverty alleviation in rural areas by fostering entrepreneurship and inducing geographic-sectoral migration. We have also examined the extent to which financial literacy training can impact on financial knowledge, financial behavior and new business start-up, drawing on a field experiment with smallholder farmers in Rwanda. In addition, we have also examined theoretically and empirically the complex ways in which financial liberalization and financial development interact to reduce or increase income inequality. Finally, we have also provided new evidence that shows that the effects of financial development on poverty alleviation vary substantially across different regions of the world and are examining the extent to which financial access/inclusion can help reduce financial fragility by making financial systems more resilient.

POLICY IMPLICATIONS

Our findings have a range of important policy implications including developing better financial regulation, better financial knowledge and stronger institutions and addressing political obstacles to financial development such as ethnic fractionalisation. They are also suggesting that financial fragility is an important, often hidden, impediment to sustainable financial development and access in LICs that is not sufficiently well understood; this will need to be addressed through financial reforms involving bank restructuring and bank resolution.
Financial regulation in low-income countries: Balancing inclusive growth with financial stability

Institution: ODI
Principal investigator: Stephany Griffith-Jones
Research status: Complete

RESEARCH MOTIVATION
To think about what financial system might be needed for African low-income countries (LICs) and what specific features it should have to support the twin goals of financial stability and inclusive growth; and, as this system evolves from an early stage, how its structure and regulation might be shaped, and what can be learnt to achieve these goals from recent reform experiences of financial systems in developed and emerging economies in the wake of the global financial crisis.

RESEARCH QUESTIONS/HYPOTHESES
Aim: investigate interactions between financial regulation and financial sector structure, and their impacts on financial stability and inclusive growth in LICs.

Research questions:
1) How does domestic regulation influence financial structure and behaviour in LICs and how do these affect financial and macro-stability and inclusive growth?

2) What scale, and what pace of growth, of financial sector are desirable?

3) What are the most appropriate level and composition of capital inflows to maximise inclusive growth while maintaining stability and promoting income equality; and how does capital account management influence the pattern of capital inflows?

4) What forms of domestic and external regulation in LICs are most likely to achieve the optimal balance between stability and growth and how does this vary in countries with different economic and financial structures?

5) Given the prevalence of information, administrative, and capacity constraints in many LICs, what forms of financial regulation and capital account management are most likely to realise these aims in practice?

APPROACH AND METHODS
- Systematic and in-depth reviews, providing background for empirical research and benchmark our findings.
- Country case studies, prepared by four academic led country teams relying on national-level datasets and interviews with key local stakeholders.
- Semi-structured interviews with policy makers of LICs.
CALL 1 SUMMARIES - FINANCE

MAIN FINDINGS (IF APPLICABLE)

- LIC banks apparently well-capitalized and very profitable, but charging clients excessive spreads; resulting high costs to borrowers a clear problem for growth of the rest of the economy; not just quantity of finance that matters, but maturity and cost.
- Capital adequacy in case study countries far above required Basel level; this may further stability, but discourage credit, particularly to the SME sector.
- Significant progress on having strong regulatory framework in place. But challenges remain: how to deal with complexity and capacity issues.
- Bank credit mostly short term (consumer credit and working capital).
- Growing dependence on private foreign finance, but this dependence is risky, as it creates financial sector vulnerability with uncertain benefits for growth. This has already been unfortunately shown to be true by increased cost of borrowing by African LICs.

POLICY IMPLICATIONS

- Efforts needed to increase provision of long-term finance for investment in sectors such as infrastructure, agriculture and manufacturing.
- Need for a more diversified mix of financial institutions, and regulation should be adjusted to allow for establishment of institutions that include in their mission social and developmental goals.
- Capital account management, as well as prudent public foreign borrowing needed to avoid build-up of vulnerabilities;
- A more gradual and selective approach to financial regulation needed.

Clearly there is not enough finance to support inclusive growth in LICs. It is not just the quantity of finance that matters, but its maturity and cost. There is insufficient finance, and that which is available tends to be short term, expensive, and not well suited to the needs of borrowers. An area of focus of this project has been the cost of loans, which remains high in many LICs. This restraints growth and fosters financial instability. Solutions have proved elusive. Numerous reforms to increase competitive pressure and efficiency in the banking sector have had little impact upon spreads. Identifying and addressing the determinants of reducing the cost of finance, for individuals and firms in LICs, including through greater transparency and possible regulation, such as capping interest rates is a crucial area of future research.

The structure of the banking sector is important. A first feature should be that the financial sector should be simpler, in the sense that, for example, the type of instruments used should not be complex or opaque, and thus the risks could be more easily assessed by the institutions themselves, and by the regulators. This facilitates regulation itself to be simpler. Furthermore, simple arrangements and institutions that increase and share information, like credit bureau, can play a very positive role to both increase access to credit and to enhance financial stability.

Evidence suggests that a diverse set of banking institutions would improve both the quantity and quality of finance for different borrowers, and thus have positive impacts on inclusive growth and stability. As regards the latter, the benefits of diversification for reducing risk is well known, within institutions, but should also be applied across institutions.

While the potential for development banks to foster inclusive growth in LICs is significant, there are some risks. Our understanding of how to design and run ‘good’ development banks that can fulfil this potential while avoiding risks is growing, but remains at an early stage. The need for development banks is not new, but new challenges and what we have learned about successful development banks make this a new area of research in development finance.
Regulation is fundamental. If we know more about the types of financial institutions that are best suited to balancing inclusive growth and stability in LICs, it is necessary to design regulatory frameworks and other measures to encourage/support the emergence of these institutions. A second issue is how different types of institutions should be regulated and supervised in LICs. The benefit of a diverse set of finance institutions is that they can offer different services to different groups of customers. Furthermore, though regulation may be diverse, it should be equivalent, to avoid regulatory arbitrage. It should also be comprehensive, so all financial institutions providing credit are regulated, but such regulation should be proportional to the level of systemic risk different financial institutions are likely to generate.

Macro-prudential regulation is an important area for regulation that has been mainstreamed since the global financial crisis. It requires better understanding on how domestic regulation interacts with the macro-economic and external environment in a LIC setting, including which tools are most appropriate (whether for example focusing on domestic financial regulation or managing the capital account) to deal with this interaction. Simply importing frameworks from developed and emerging countries, such as Basel 2-3, is not the solution.

Financial sector development is crucial for inclusive growth in LICs. However, financial instability can have devastating consequences, especially for poor people. How finance can help achieve the optimal balance between growth and stability in LICs, and the role that regulation should play in this, is among the most pressing development questions policy-makers and researchers face. We hope to have contributed to an understanding of these issues with this project, by providing some answers, but many more questions.
Training, Productivity, and Upgrading: Evaluation of Female and Supervisor Training Programs in the Bangladesh Apparel Sector

Institution: University of Warwick
Principal investigator: Christopher Woodruff, Rocco Macchiavello, Atonu Rabani
Research status:

RESEARCH MOTIVATION
The garment industry in Bangladesh contributes one-eighth of the country’s economic output and accounts for 80% of export earnings. The industry has generated many employment opportunities for women, with roughly two-thirds of the 4 million workers being female. Though the garment industry is a forerunner in women’s employment in Bangladesh, the positions available to women at factories remain mostly limited to the machine-operator level. Working with partners in the industry, we designed a research programme to understand the barriers to female advancement into management ranks, and the implications for productivity in the industry.

RESEARCH QUESTIONS/HYPOTHESES
- Why are there so few female supervisors? Is this efficient, or the result of barriers to promotion of women?
- Is managerial capital misallocated?
- That is, is the marginal male supervisor less productive than marginal female supervisor?
- If so, can we identify the barriers which prevent a transition toward more female supervisors?

APPROACH AND METHODS
We work with 80 large garment factories to identify and train line operators to be line supervisors. Selected female and male operators are given six weeks of training in a course developed by GIZ and local training companies. The design evolved as the project progressed, but in the final design, the factories agreed to give all trainees a six-week trial as a line supervisor. The factories provided the researchers with a list of lines on which trainees would be trialled, and we assigned trainees randomly to those lines. We measure performance through surveys with operators working under the trainees, and using detailed administrative production data. We also conduct an extensive skills diagnostic of all trainees at baseline and again after the training.

MAIN FINDINGS
At baseline, workers at all levels rate males as superior to females in each of eight supervisory skills. The largest perceived advantage for males related to “knowledge of machines.” An extensive skills diagnostic indicates there is no actual difference between male and female trainees with regard to machine knowledge.

Female trainees express lower levels of self-confidence prior to training. The largest effect of training is raising the confidence level of female trainees.
CALL 1 SUMMARIES - INNOVATION

Production lines led by female trainees initially perform worse than male-lead lines, but catch up after 4 months. The perceptions of operators follow the same pattern. Female trainees are initially rated as less effective than male trainees, but there is not difference after four months.

56% of females and 74% of males promoted, but 31% of promoted women leave the factory.

POLICY IMPLICATIONS

Though the promotion rate for female trainees may seem meagre in comparison to their male colleagues, it is important to consider that the average factory we worked with only employed 1-2 female supervisors before participating in the program. The typical factory sent three male and three female operators to training, and 15-18 months later retained two 2 male supervisors and 1-2 new female supervisors, this still represents a 50-100% increase in the number of female supervisors.

Having just one additional female supervisor means typically 55 helpers and operators (43 women) are directly exposed to female leadership. We know that female trainees lack confidence, and having a female role model could help these 43 women build self-confidence, expanding the pool of potential candidates for the next round of promotions. We also know that after prolonged exposure to a female supervisor, operators’ assessment of female supervisors improves, and their preference for male supervisors weakens. In this example, the 55 workers would become less likely to disrespect or reject their current supervisor as well as future female supervisors solely on the basis of their gender.

One of the factories that participated in the program began piloting an all-female production line in November 2015, roughly one year after the training program ended. To paraphrase a manager at the factory, they wanted to ‘empower female workers, and have less chaos in the factory.’ We have heard the latter reason given at other factories as well, which mention that female workers are less likely to create trouble for the factory such as political, or other agitation and unrest. They had a mixed-gender and an all-female line, which were both given the same products to produce to allow for simple comparisons of efficiency. They found that productivity on these lines were similar and were impressed with the way the all-female lines worked, so expanded to six all-female lines. In the subsequent months, one of the all-female lines was the best performing line in the factory of 60 lines for two consecutive months. The training manager has also noticed the female workers in the all-female lines have a more positive attitude. Factory management are planning to continue the expansion to make an all-female floor.

We are presently working the ILO/IFC Better Work Bangladesh to develop a more compact and scalable version of the training program for Better Work factories.
Improving productivity in developing countries
Identifying bottlenecks and obstacles to investments and technology adoption

**Institution:** The Institute for Fiscal Studies
**Principal investigator:** Orazio Attanasio
**Research status:** Completed

**RESEARCH MOTIVATION**

Much evidence shows that productivity in developing countries can be extremely low. This is particularly true for agricultural activities (Garcia et al., 2003). In many situations, policy makers, practitioners and researchers have identified simple innovations and investment opportunities that would greatly improve productivity and offer a substantial rate of return and, yet, for whatever reason - to be investigated in detail in this research - do not get adopted. The consequences of these failures can be severe, with individuals and communities getting trapped in low productivity activities, failing to realise their potential, and failing to enjoy economic growth and prosperity.

It is crucial, for the design of policies aimed at improving productivity, to establish the main causes for these failures. There is a need to understand what imperfections and frictions imply the existence of substantial profit opportunities that simply do not get exploited. Many hypotheses exist for these failures, ranging from failures of insurance and credit markets, to the lack of information or know-how on the appropriate technologies available in a given context, to social norms, to the lack of appropriate infrastructure. Market failures can be due, in turn, to asymmetric information among individuals, or between communities and the suppliers of credit and insurance services, or to the lack of enforcement mechanisms and institutions.

In our project, we combined work on four independent projects, all aiming to contribute to the identification of imperfections that prevent the adoption of technology and innovations with a potentially high rate of return. Of the four projects we included, two study constraints on investment into physical capital (agriculture and livestock), and two studied constraints on investment into human capital, in particular health. The link between ill-health, education and productivity is well established (Strauss and Thomas 1998, Glewwe et al. 2001, Alderman et al. 2001, Miguel 2005, Schultz 2005, Behrman et al. 2006, Hoddinott et al. 2008, Van den Berg et al. 2006, Van den Berg et al. 2007).

**RESEARCH QUESTIONS/HYPOTHESES**

Our study of imperfections and constraints focuses on four themes:

1. lack of information (on know-how or on returns) for making investment decisions
2. market failures: limited access to formal credit and insurance markets
3. constraints to market linkages and infrastructure
4. constraints relating to social norms: gender roles; the role of networks.

These general themes will be developed in four different contexts, addressing different hypotheses:

The first project considers the provision of training and productive assets to indigent households in poor districts in Pakistan. The interventions also link these households to markets and market opportunities.
The aim is to identify whether constraints relating to farmer knowledge and lack of market linkages result in low levels of productivity in livestock rearing. This project speaks to themes (i) through (iv).

The second project analyses a similar intervention, implemented in a remote region of India. Here, however, to invest in livestock, beneficiaries have to take out a micro-loan. This allows us to relate investment decisions to the availability of credit and insurance, as well as to information on the activity’s costs and returns available to households. This project is relevant for themes (i) through (iii).

The third project analyses the impacts of a sanitation intervention on beneficiaries’ productivity (through health) in poor parts of India. This research project is relevant for themes (i) through (iv).

The fourth project is motivated by the link between ill-health and long-run productivity. It seeks to answer the question of whether social norms hinder the adoption and diffusion of new health practices in rural Malawi, thus contributing to bottlenecks in the diffusion of new technology and other practices that enhance productivity. This addresses themes (i) and (iv).

**APPROACH AND METHODS**

Three of the four projects in this study are based on Randomised Control Trials (RCT) designed to estimate the impact of specific interventions. Our approach, however, goes beyond the simple objective of impact evaluation: by specifying and estimating structural models of individual behaviour in a world with frictions and market imperfections we will identify the mechanisms underlying the observed impacts, allowing general lessons to be drawn for a variety of contexts. The basis for estimating our models will be the rich data sets collected for evaluating the programmes and the (mostly randomised) variation introduced by the interventions. Combining these two aspects with an innovative and rich economic framework will allow us to draw important lessons for policy design. Most of this work is currently still ongoing.

**MAIN FINDINGS (IF APPLICABLE)**

Each project within our umbrella theme, made independently important strides during the period of this grant, producing evidence to answer stated research objectives. Some of the new evidence that comes out of this grant includes:

- Relatives, grandmothers in particular, can play an important role in shaping responses to an information campaign targeting infant health. In order to increase the impact of information campaigns, our findings suggest that excluding influential older women can weaken intervention impact by exposing a divergence between traditional views and new information;

- A further important contextual factor in improving children’s health is that of sanitation. Our research demonstrates a link between increased sanitation coverage in the child’s environment and its health status, which has so far proven difficult to rigorously establish;

- Evidence such as that linking sanitation and child health calls for programs that increase sanitation uptake. Our research suggests that credit constraints might not be a key barrier to adopting sanitation, despite households reporting the same. Our evaluation of an intervention providing credit for sanitation does not lead to an increase in the adoption of this technology (despite credit uptake);
We conduct a cost-benefit analysis of owning livestock, particularly cattle. The findings feed into a recent debate on why people invest in livestock (some arguing that it is not rational given no/low returns), stressing the importance of considering variations in returns over time.

POLICY IMPLICATIONS

Our findings will be particularly useful for policy makers and implementing NGOs. For example, findings from Malawi can be used by agencies working on child health and nutrition campaigns in developing countries, findings from India can be taken up by government officials and other stakeholders as backing evidence for the importance of pushing improvements in sanitation, and findings from Pakistan (not yet finalized at this stage) will be useful for government and donor funded programs aimed at improving livelihoods for the poor in Punjab, Pakistan as well as those wanting to learn about asset transfer programs.
Malaria, Productivity and Access to Treatment: Experimental Evidence from Nigeria

**Institution:** Michigan State University, University of East Anglia  
**Principal investigator:** Andrew Dillon, Pieter Serneels  
**Research status:** Completed Project

**RESEARCH MOTIVATION**

The consequences of ill health for productivity and economic development are presumed to be severe yet the rigorous evidence base for such a linkage is small. In previous work, statistically significant and large intent to treat effects were estimated on earnings, labor supply and productivity of a curative malaria treatment at a large sugarcane plantation in Nigeria. A mobile health clinic was established on the plantation and used an exogenously determined ordering of workers to test and treat workers. Despite large treatment effects, we find that workers have low rates of seeking curative and preventative treatments. To better understand this puzzle, this study offers access to malaria treatment and insurance at exogenously varied prices to estimate its effect on take-up and frequency of health care. In a separate phase, the study was extended to measure the effect of treatment on both worker productivity and physical activity. This builds insights on the effects of malaria treatment on physical activity in general, and shed light on the wider relevance for agricultural activity and beyond.

**RESEARCH QUESTIONS/HYPOTHESES**

We address two main research questions in our study:

1. What is the impact of a curative malaria treatment on worker earnings, labor supply, productivity and physical activity levels?
2. What are the determinants of malaria insurance take-up and usage? What is the impact of malaria insurance on worker earnings, labor supply, productivity and physical activity levels?

**APPROACH AND METHODS**

We collected data using a randomized control trial design in 2013 and a willingness to pay lottery in 2014 to test research questions 1 and 2 respectively, on a large sugarcane plantation in eastern Nigeria. The study site was selected because it has a large worker population (800 workers) which is paid on a piece rate basis, facilitating the estimation of individually attributable productivity effects.

**MAIN FINDINGS (IF APPLICABLE)**

The preliminary findings for the two main research questions are as follows

1. Alternative Productivity Measures and Replication Results: This study extends previous work on the impact of a malaria testing and treatment program by replicating a study design previously reported in Akogun et al. (2014). We find similar earnings effects of the malaria testing and treatment program on workers who tested positive (7 percent increase in earnings due to treatment) as in previous rounds, yet the statistical precision of these estimates suffers due to an unforeseen closure on the plantation during the study period which limited the number of worker-week observations. During the same study period, alternative
measures of productivity using physical activity monitoring were collected for a worker subsample. Treatment effects on the treated using measures of physical activity indicated that workers daily average time sedentary reduced by forty minutes and time in light and average physical activity levels increased for the mean treated worker by 31 and 32 minutes, respectively. A composite measure of physical activity is also statistically significant at the 5% level despite the reduced sample size. These results suggest that alternative productivity measures such as physical activity illustrate an important mechanism through which malaria treatment affects labor productivity and earnings, and opens up potentially promising ways forward for productivity measurement in agricultural and physically demanding activities.

2. Provision of Malaria Care Insurance: Our data confirms that workers’ willingness to pay for the type of health insurance on offer is modest, but also shows substantial variation. Demand is price sensitive with an estimated elasticity of -0.25. Workers with more experience with and exposure to malaria health care tend to have higher willingness to pay, as do workers who have more accurate knowledge of the treatment of malaria (but not about symptoms or prevention). Those with higher general trust are also willing to pay more. We find little evidence for workers’ risk preferences playing a role. For those who gained access to the insurance, we investigate the correlates of use of the service, and find, that apart from exposure and past experience, education, trust and self-assessed health also play a role. We then estimate the effect of health insurance on worker productivity, using the price draw as an instrument, and find that especially those with low willingness to pay benefit considerably from access to insurance, as it increases their income with roughly 10%, primarily through increases in daily productivity. Preliminary findings also indicate that for those who have gained access to the health insurance, use of the health care covered has strong effects on income, in particular through its effects on labor supply, but not productivity.

POLICY IMPLICATIONS

For research question 1, Individual labor productivity is difficult to measure without individually attributed worker output, typically only available in piece rate settings. Our research investigates a possible alternative measure of individual worker productivity: a direct measure of physical activity using an accelerometer, which may be feasible to collect in numerous labor settings, and specifically of interest for physically demanding work like that in the agriculture. We establish the validity of this measure in an agricultural labor force where workers are paid per quantity of sugar cane cut. The research results suggest an important indirect cost of malaria on physical activity which should be considered by policy makers in designing agricultural and health policy.

While average demand for workplace based malaria testing and treatment among agricultural workers seems low on average in our setting, there is considerable variation in worker willingness to pay with some workers offering substantial amounts. Demand for these services is price sensitive, especially at lower price levels. The findings indicate that workplace based malaria services have a clear future. Further analysis will clarify the profiles of workers who are willing to pay more or less respectively. More generally, the findings suggest that a mixed funding of the fight against malaria, where different parties, including government, workers and employers contribute to the cost of malaria health care, may provide a clear way forward and a more sustainable base of funding.
The Diffusion of Innovation in Low Income Countries (DILIC)

Institution: University of Oxford; Maastricht University; Overseas Development Institute
Principal investigator: Professor Xiaolan Fu (University of Oxford)
Research status: Project completed

RESEARCH MOTIVATION
Is innovation relevant for the low-income countries (LICs)? For some people the answer is a clear ‘yes’, but other people may argue that there are other more important issues in LICs, such as food safety, water, health and conflict. However, only innovation and technical progress can provide fundamental solutions to the major challenges facing LICs, such as poverty reduction, environment and resource constraints, and sustainable development. Therefore innovation should be regarded not as an outcome of development but as a means to achieve it. However, our understanding of these issues and relationships in the LICs specifically is limited. DILIC project aims to fill in the knowledge gap by exploring determinants and transmission channels for effective innovation creation, diffusion and adoption in LICs under institutional, resource and affordability constraints.

RESEARCH QUESTIONS/HYPOTHESES
For countries at the bottom of the development pyramid, technological innovation is decisive for industrialisation and catch-up. Tapping existing knowledge and know-how can effectively support their development process. The project aims to:

- Understand the nature of innovation in low-income country context;
- Identify the barriers to innovation creation and diffusion in LICs under institutional, resource and affordability constraints and the space for innovation policy;
- Analyse the determinants of knowledge diffusion in LICs from leading innovators to latecomers, in particular the role of university-industry linkage and inter-firm networks;
- Examine the effect of external knowledge diffusion to LICs, in particular the productivity impact of South-South trade and FDI with a special focus on Chinese trade and FDI in Africa;
- Develop an SME open innovation network model to increase frugal innovation for the poorer societies in LICs.

APPROACH AND METHODS
The project research questions were address by adopting both quantitative and qualitative approaches, and using various data sources. The main evidence was drawn on the data collected from DILIC project survey, which was designed and implemented in Ghana and collected detailed information on the innovation activities of more than 500 formal and informal firms. The data collected is giving an invaluable contribution to better understanding the role of innovation in a LICs context and will better inform policy-makers on how to support the diffusion of innovation and incentivise its adoption among firms.

This carefully designed pioneering survey offers distinctive evidence on the form and nature of innovations in the LICs context, the origins and the effective channels for the diffusion of innovation.
within the country and from foreign sources to these countries, the barriers to innovation creation and diffusion, and the space for innovation policy in these economies.

MAIN FINDINGS (IF APPLICABLE)
From a survey of more than 500 formal and informal firms in Ghana, six key findings have emerged:

- Firms in Ghana undertake relevant innovation activities, both in technological and non-technological fields, and within the formal and informal sector.
- The majority of the innovations in LICs are about appropriate technologies and processes in or for the base of the development pyramid.
- Innovations in Ghana are mainly originated and diffused within Ghana, although some are sourced directly from a range of foreign countries, mainly in formal firms.
- International knowledge is mainly acquired via imports, internet, multi-national enterprises (MNEs) in the same industry, and participating in export markets.
- Lack of specific skills and access to credit, as well as market constraints, are the main bottlenecks firms face during the process of knowledge adaptation and innovation.
- Although firms in LICs are innovative and government is regarded as important innovation partner, they go very largely unsupported.

POLICY IMPLICATIONS
Policies play a critical role in accelerating the diffusion and creation of innovation and mitigating the obstacles LICs face. Recognizing the important role that knowledge and innovation must play in transforming the economy and reducing poverty, the Government of Ghana has placed S&T development high on its list of priorities. The current policies and strategies emphasise that absorption and application of much more S&T is a critical ingredient for successful growth. However, the project findings revealed that firms need even more support, and policies should be followed by a strong commitment by the Government. Incentivising external transfer of innovation, facilitating cluster participation, easing access to credit, and further strengthening education and the capacity to use research are all critical actions that can mitigate some of the current constraints and drive economic growth in the long run.
Industrial Productivity, Health Sector Performance and Policy Synergies for Inclusive Growth: a Study in Tanzania and Kenya

RESEARCH MOTIVATION

This project studies the supply chains of essential medicines and medical equipment and supplies from local industries and imports into the health systems in Tanzania and Kenya. Shortages and unaffordability of these commodities are persistent causes of exclusionary and poor quality health care in low income Africa, while industrial development is an essential component of African development. The project has explored the scope for innovative synergies between health and industrial policies in the two countries.

RESEARCH QUESTIONS/HYPOTHESES

Our central research question was the following: in low income African countries, and specifically in the case study countries of Tanzania and Kenya, to what extent are there unexploited potential synergies between industrial development and health systems strengthening, and what policies could help to exploit such synergies in order to contribute to faster and more inclusive growth? In more detail, we aimed to establish the scope for industrial improvement and innovation in products and processes to supply commodities required by the health systems and their users; the scope for such improved local supply chains to strengthen health system performance and hence the inclusiveness of health care; the obstacles to exploitation of such opportunities and what policies might contribute to overcoming them, through engaging private sector businesses and policymakers in debate with health sector managers and policymakers.

APPROACH AND METHODS

The project has interviewed health facilities, shops and wholesalers in all sectors, in urban and rural contexts, about their procurement practices and problems. Quantitative data was collected on the availability and sources of a tracer set of medicines and other essential health care supplies (Stage 1). Mapping of local and international supply chains was followed by interviewing of wholesalers and manufacturers in Kenya and Tanzania (Stage 2). Data analysis after each stage was followed by high level policy dialogue workshops bringing together private sector businesses and policymakers, and health sector managers and policymakers, to debate the scope for more integrated policy making. Subsequent dissemination and impact activity has included the production of a flagship book Making Medicines in Africa (Palgrave Macmillan, open-access under a creative-commons licence, 2016); invited presentations by team members in Kenya and Tanzania; and advisory work for government bodies and in international fora. This dissemination and debate have fed back into further analysis.

MAIN FINDINGS

This policy-focused project uniquely combines analysis of low-income country health care systems with a corresponding investigation into local manufacturing capacity. There are huge unmet needs for essential medicines and supplies, and domestic health markets offer large unexploited opportunities for locally based manufacturers.

In summary the project has identified:

- the extent of opportunities to combine better health care with industrial development;
CALL 1 SUMMARIES - INNOVATION

- strengths and weaknesses of domestic supply chain linkages, and sources of disaggregation;
- the core challenge faced by locally based firms of upgrading to achieve and sustain competitiveness;
- existing policies that support or undermine health-industrial synergies;
- the reshaping of health systems and procurement required to use local suppliers effectively.

A conceptual framework of industrial and institutional capabilities is used to show how industrial suppliers of essential medicines and medical supplies in both countries face sharply rising international competitive pressures. These result from: broader trade liberalisation and specific policies encouraged by donors to remove tariffs and taxes from imported health sector supplies; externally focused international procurement; competitive and regulatory pressures for higher quality standards; and changes in first line treatments for major illnesses requiring investment in technological upgrading. All domestic manufacturers interviewed engaged in continuous upgrading: hugely challenging in their context of poor infrastructure, expensive and limited industrial finance, and low education and skills (particularly serious in Tanzania).

In both countries, pharmaceutical companies are mainly locally owned, and in neither country is their domestic market share rising. In Tanzania local pharmaceutical firms’ domestic market share has recently been falling sharply as they struggle to cope with competitive pressures. Kenya-based producers are doing better within a much stronger national industrial base, sustaining domestic market share and increasing exports to regional markets. Both sets of firms need industrial policy frameworks that support sustained investment in improved technological capabilities, including upstream supplier improvement, associated with sufficient time-limited trade protection.

Health sector organisation and procurement processes also need to build the collaborative capabilities to extract local health-industrial synergy. Damaging and exclusionary reliance on out-of-pocket payments, and doubtfully sustainable reliance on Asian suppliers, both need revision towards more tax and social insurance funding for supplies and public procurement policies that reduce barriers to entry for local firms. There are lessons from good procurement practice in the non-profit sectors, which were found to purchase a higher share of their supplies from domestic manufacturers while private wholesalers relied more on imports.

POLICY IMPLICATIONS

Collaborative capabilities in industrial and health policy have to be built, from a basis of limited previous communication between relevant Ministries and international stakeholders. The project has created local forums for industrialists, industrial and health policy makers, regulators and medical officers to interact directly, opening possibilities for creative interventions to radically improve effective governance in this crucial area of development. Findings by the Tanzanian team at REPOA, Dar es Salaam, have been presented in a number of national and regional policy fora, and have been drawn upon in Tanzania’s new Five Year Development Plan which prioritises pharmaceutical development as part of the country’s industrial development strategy. The findings are also presented in an invited contribution to the Tanzania Human Development Report 2017 (UNDP-supported), and will be presented in an invited panel at the World Investment Forum, Nairobi 2016 (UNCTAD-supported).

Internationally, the project has contributed to expanding research in this field, notably through a UNIDO-supported publishing initiative on Making Medicines in Africa that created and drew upon a network of African scholars in this field, interacting with Indian and Brazilian experts, and reporting experience from nine African countries. The book Making Medicines in Africa: the Political Economy of Industrialization for Local Health was launched by invitation at the Africa Pharmaceutical Summit East, March 2016, where it was widely downloaded by a large audience of pharmaceutical manufacturers and associated practitioners.

The Working Papers, Policy Briefs and Presentations are available on the project website hosted by our Kenyan collaborator, ACTS, Nairobi, at http://iphsp.acts-net.org/.
CALL 2 SUMMARIES - FINANCE

CALL 2 – FINANCE

LICs Navigating Global Banking Standards

**Institution:** Blavatnik School of Government, University of Oxford

**Principal investigator:** Dr Emily Jones

**Research status:** In progress

RESEARCH MOTIVATION

Global banking standards such as Basel II and III were developed primarily by G20 countries with large multinational banks in mind. Many LICs have been encouraged to adopt (and, indeed, are adopting) these standards despite having played no part in developing them in the first place. There is precious little research on exactly which elements of these standards low-income regulators are adopting, the motivations behind regulatory decisions, or the implications for financial sector development. The main objectives of the project are to identify the constraints and opportunities LICs face when engaging with global banking standards; and to identify effective strategies LICs can pursue in adapting global banking standards to their specific contexts and regulating cross-border banking for inclusive growth. Our project uses a mixed-methods political economy approach and we have a team of researchers drawn from a variety of disciplines and countries.

RESEARCH QUESTIONS/HYPOTHESES

They key questions addressed in the research are:

- What are the main international and domestic drivers of LICs adoption of global banking standards? What explains the variation we see in the rate of adoption among these countries?
- How much de facto flexibility do LICs have when it comes to adopting global banking standards? How much do they need?
- Under what conditions should LICs adopt elements of global banking standards? Which elements are most suited to which national context?

Building from the existing literature we are exploring hypotheses related to technical fit, market drivers, government strategies and international official channels. In general, we find that Basel standards are costly for regulators and banks alike to adopt. We expect to find higher levels of adoption in LICs with higher levels of supervisory capacity and deeper financial sectors. We also expect that regulators adopt the standards in order to signal to international markets and investors that their banks are well regulated and to bolster the reputation of their banks as they expand overseas. It is also plausible that adoption occurs as the result of lobbying by international banks, particularly those headquartered in Basel Committee countries, which seek harmonised regulations across all the jurisdictions in which they operate. Finally, we expect that LICs are more likely to adopt global banking standards if they are advised to do so by international financial institutions that hold influence in the country, or if they regularly interact with regulatory peers who have adopted global banking standards.
APPRAOCH AND METHODS

We are testing our hypotheses through statistical analysis and qualitative case studies. We have compiled a new database covering 100 countries outside of the Basel Committee on Banking Standards with details on the specific elements of Basel II and III that have been adopted (based on surveys conducted by the FSI). Our explanatory variable data on financial sector depth and supervisory capacity is drawn from World Bank databases and surveys, while data on presence of cross-border banks is drawn from a dataset compiled by Stijn Claessens and Neeltje van Horen. Data on membership of LICs to networks of banking supervisors was hand-collected.

We are undertaking qualitative case studies on Ghana, UEMOA, Angola, Tanzania, Kenya, Ethiopia and Vietnam, drawing on interviews with members of central banks, finance ministries, international financial institutions, bank management staff, and academics, as well as applicable secondary literature. We are exploring the addition of two further cases with high levels of Basel adoption.

MAIN FINDINGS (AFTER ONE YEAR OF RESEARCH)

Our headline finding so far is that government regulators, rather than market actors (banks or investors) are in the driving seat when it comes to Basel adoption. Our preliminary statistical analysis confirms our hypothesis that financial sector depth and institutional capacity are positively correlated with adoption of global banking standards across the world. Surprisingly, we have found little evidence that the presence of international banks drives adoption. There is some evidence that regulators adopt Basel standards in order to bolster the reputation of domestic banks as they expand overseas.

Preliminary papers on our case study countries support these findings. In Vietnam, plans for adoption appear to be driven by the government’s desire to appear more attractive to international investors and trade partners, while adoption in Ghana was initiated by the country’s desire to become a financial services hub in West Africa. Angola recently moved to adopt the standards in a bid to improve the international reputation of its banking sector. In contrast, government regulators in Tanzania and Ethiopia appear to have decided not to adopt Basel II or III because it is a poor fit with their financial sector development strategies. Kenya is a relatively high adopter of Basel standards and, among our case studies, has the highest number of banks operating overseas, suggesting that adoption may be a move to facilitate overseas expansion by its banks. The West African Economic and Monetary Union is planning to adopt Basel II and III, due in part to the influence of the IMF, but may be constrained by the limited capacity of the union’s Banking Commission.

POLICY IMPLICATIONS

Our preliminary findings suggest there are strong market-based incentives for regulators in LICs to adopt advanced banking standards. While the need for global standards is widely recognised and supported, there are concerns that Basel II and III are too complex for low-income jurisdictions. The policy implications are threefold: (1) LICs should have a greater voice in global standard-setting bodies – at present they are not represented (2) that global standards should better reflect the heterogeneity of financial systems across the world, perhaps by having a tiered approach, and (3) more lesson-sharing among developing countries regulators on how to adapt Basel and other financial standards to their jurisdictions.
Financial Volatility, Macroprudential Regulation and Economic Growth in Low-Income Countries

Institution: University of Manchester
Principal investigator: Professor Pierre-Richard Agénor
Research status: Active

RESEARCH MOTIVATION

The Global Financial Crisis highlighted weaknesses in macroeconomic and regulatory policies and market failures that contributed to a build-up of systemic risks. At the international level, reform proposals have led to the adoption in 2011 of the Basel III banking standards.

However, much of the debate has focused on the implications of financial volatility for short-term economic stability, rather than their long-run effects. Although this emphasis is important—many countries, especially the poorest ones, have very low resilience and capacity to cope with adverse short-term shocks—it is also problematic because one lesson of financial crises is that they often have large adverse, long-term effects on financial development and economic growth.

Accordingly, the purpose of the project is to study, both theoretically and empirically, interactions between financial volatility, prudential regulation, and economic growth, in the context of Sub-Saharan Africa and to draw broad policy lessons for the design of macroprudential rules in low-income countries. Within Sub-Saharan Africa, the project focuses particularly on Francophone countries; for the issues at stake, and their implications for policy design, the nature of the monetary and financial arrangements in these countries have important implications.

RESEARCH QUESTIONS/HYPOTHESES

The project was designed to address the following key questions: How does financial volatility affect long-run growth? Can macroprudential rules designed to reduce the procyclicality of financial systems be detrimental to long-run growth, due to their effect on incentives to lend or engage in risk taking? Is there a need to revisit the pace of domestic financial liberalization, or international financial integration, given the potentially adverse effects of financial volatility on growth? Clearly, some of these issues are equally relevant for industrial countries; but they are particularly important for the poorest countries (including those in Sub-Saharan Africa), given the need for these countries to maintain high growth rates to reduce poverty and promote human development.

Given this focus, the project has four objectives:

1. Contribute to the existing analytical literature in areas related to the links between financial volatility and economic growth, and how the macroprudential regulatory rules currently embedded in Basel III (especially those deemed appropriate for the institutional context of developing countries, such as liquidity requirements and leverage ratios) can help to mitigate the adverse effects of financial volatility on growth;
2. Provide new evidence on the impact of financial volatility and its determinants (both domestic and external) on economic growth, with particular attention to the case of the low-income countries in Sub-Saharan Africa;

3. Develop case studies for Francophone Sub-Saharan African countries focusing on the links between financial volatility (broadly defined to include volatility of remittances and capital flows, both public and private), macroprudential regulation, and growth, to account for their specific monetary and financial regime, and complement case studies being developed in parallel ESRC-DFID projects, thereby allowing a broader comparative analysis of these issues for the region;

4. Identify the practical policy implications of the analytical and empirical research and discuss the extent to which they differ from the “consensus view” in areas related to the benefits of financial liberalization and the effectiveness of macroprudential policy (especially those being considered under Basel III) in promoting growth.

APPROACH AND METHODS
To address the objectives described above, the project has developed six theoretical and econometric papers (each with an associated policy brief), and two country case studies. The material developed in these contributions will serve (later this year) as a basis for the preparation of two broad policy briefs, which will review for a wider, non-academic audience the policy lessons that can be drawn from the project.

The methodology used in these contributions varies from endogenous growth models with a financial sector and macroprudential regulation for the theoretical papers, to dynamic panel data methods for the econometric papers and interviews with key stakeholders for the country case studies. The econometric contributions are all based on comprehensive and newly-collected data (on macroprudential instruments, the composition of private capital flows, and bank-level statistics) in both low- and middle-income countries (the latter group being included for comparative analysis).

MAIN FINDINGS (IF APPLICABLE)
Because several papers are still being refined, and the case studies are still under way, an integrated discussion of the main findings of the project is not yet available. However, the individual papers, which are available on the project’s main website at http://www.socialsciences.manchester.ac.uk/cgbcr/research/escr-dfid-project/, have all drawn their individual policy implications. These implications are discussed in the policy briefs associated with each paper; these briefs are available on the project’s partner website, FERDI (with a direct link from the main site).

POLICY IMPLICATIONS
As noted above, although at this stage an integrated discussion of the main findings and policy implications of the project is not yet available, each individual paper has an associated policy brief (available on the project’s partner website, FERDI) where specific implications are discussed.

give rise to a growth-promoting effect. Using a broad definition of financial volatility as the volatility of international capital flows and using aggregated indicators of macroprudential regulation, it investigates the effect of volatile capital flows on growth in the presence of macroprudential policies. In a panel data framework, the sample covers about 80 countries over the period 1973-2013.

The results indicate that although more variable capital flows reduce economic growth, macroprudential regulation mitigates this negative growth effect. This means that macroprudential policies, by encouraging a greater buildup of buffers, attenuate the adverse growth effects of unstable capital flows and, by so doing, are effective in limiting financial system vulnerabilities.

The study also finds that a) The outcomes are mainly restricted in the sample of middle-income countries, since it is this group of countries that have relied more on macroprudential policies; b) In Sub-Saharan Africa and, within it, Francophone SSA, macroprudential regulation has the capacity to attenuate the growth-distorting effect of volatile flows to a much greater degree; and c) The effectiveness of macroprudential regulation diminishes in magnitude in economies that are relatively open, with deeper financial systems, and exposed to greater macroeconomic instability.
Worker Selection, Work Discipline and Development

**Institution:** Institute of Financial Management and Research, India  
**Principal investigator:** Dr. Sharon Buteau (lead), Dr. David Atkin and Dr. Antoinette Schoar  
**Research status:** Implementation Phase

### RESEARCH MOTIVATION

In many countries, researchers have observed that productivity is substantially lower in informal and household enterprises than in larger firms. The work of Hsieh and Klenow (2009, 2012) or La Porta and Schleifer (2008) amongst others suggests that reallocating workers from informal and home-based production to factory and office-based work may be a critical factor in raising productivity and reducing poverty. However, prior to designing industrial policies predicated on this observation, we must first understand why workers in these larger firms have higher productivity and what features of formal employment improve the productivity of employees. The answers to these questions have large implications for the wages of workers, their lifetime income and economic development at a macro level.

### RESEARCH QUESTIONS/HYPOTHESES

In this project we focus on understanding one particular dimension, the productivity difference between home-based and office-based production. This productivity difference may stem from two very different sources. On the one hand, office work can serve as a sorting device. Workers may have preferences for stricter office-based work versus more flexible home-based work, and these preferences may be correlated with other characteristics such as ability and skill levels. If higher-effort higher-ability workers are drawn to the stricter work environment in an office setting, this sorting alone may generate large differences in the productivity of office and home-based units. On the other hand, if production is more efficient when organized in an office setting, or if learning is faster, the observed productivity difference between office and home-based work may be driven purely by the office-based production methods. In this project, we aim to quantify these two competing explanations for why workers in larger firms are more productive than those in small firms.

Our research design also allows us to answer three additional questions. First, what are the specific features of office work that increase productivity (e.g. better monitoring, peer effects, routine, easier coordination among co-workers etc.). Second, is there any complementarity between high-ability high-effort workers and office-based work (e.g. are the methods used to induce high productivity in an office only effective when the workers are high-ability high-effort types). Third, are there substantial differences between men and women in terms of selection into home-based employment (e.g. are higher ability women only willing to carry out home-based work for cultural reasons, thereby unable to reap the productivity improvements available through office-based work)?
APPRAOH AND METHODS

The project will use a randomized control trial design. We plan to work with a data entry operation in which some employees can work from home and others in a large office. The design will combine different treatment arms to either allow workers to choose between the office or informal work environment, or to be assigned to one of the two. This set up will enable us to compare the importance of self-selection versus the causal impact of working in one of the two settings (for more details see appendix).

POLICY IMPLICATIONS

Understanding the source of productivity differences between office-based work and home-based work is crucial for developing effective industrial policies that raise productivity in Low Income Countries. Most directly, this research sheds light on what specific industrial policies can foster productivity change? If larger-scale factory environments substantially raise productivity, policies such as Small Scale Reservation policy (where certain products were reserved for manufacture by small firms) will detrimentally affect growth. However, we get a very different policy prescription if the lower productivity of small scale units is simply due to sorting of workers on characteristics. In this case, small-scale industry policies can be viewed in a more favorable light insofar as they protect the jobs of workers who would not choose to go and work in a larger-scale factory. If these types of worker are poorer on average than the high-effort high-discipline types sorting into factory jobs, or disproportionately female, then such policies may be inequality reducing.

APPENDIX

Stage 1: workers are invited to participate in a week of paid training. During the training we will collect detailed ex ante characteristics from all the potential (initial productivity measured by data entry speed, effort levels by hours and intensity of work).

Stage 2: DEOs will be presented the work setting preferences. They can select to work from Office or Home. Subsequently, they are either given their preferred work environment (or not) as determined by randomization. The randomization scheme involves workers getting their preferred work environment with 55% probability. (This randomization will likely result in attrition of workers assigned to office (home) work since some of these workers will only be willing to work from home (office).)

Stage 3: We will carefully monitor productivity and effort levels over a 3 month employment spells via the data-entry software and time sheets. The factory environment will be modified across different 3-month rounds in order to induce variation in the features of the office environment (e.g. level of monitoring, degree of peer effects, amount of routine, need for coordination among co-workers etc.).

Stage 4: After the 3 month employment spell, workers will be provided with references and training certificates and matched to an employment agency to seek future employment.
Privatisation and productivity growth

**Institution:** University of Sussex  
**Principal investigator:** A. V. Chari  
**Research status:** In progress

**RESEARCH MOTIVATION**

In the search for explanations of the persistent productivity differences between developing and developed countries, attention is being directed towards policy barriers that inhibit the flow of resources within the economy. As Foster, Haltiwanger and Krizan (2001) have shown, in developed countries there is a process of continuous reallocation that accounts for a significant proportion of productivity growth in the economy. In contrast, as Hsieh and Klenow (2008) demonstrate, developing countries like India and China are typified by stark and persistent “mis-allocations”, in which productive resources such as labour and capital are locked into highly inefficient configurations.

In this project, we focus our attention on state-owned enterprises (SOEs), and the impediments that this type of direct state involvement tends to create to the circulation of resources in the economy.

**RESEARCH QUESTIONS/HYPOTHESES**

State-owned enterprises (SOEs) have historically contributed a significant percentage of GDP and employment in a number of developing economies. Of particular significance is the fact that the public sector has also compensated workers at a rate that is not aligned with their productivity. Hsieh and Klenow (2008) report that total factor productivity in SOEs in China is nearly 40% lower than that of private enterprises. At the same time, they also report a significant dispersion in marginal factor productivities, symptomatic of a distorted allocation of factors. This suggests the possibility that privatisation of SOEs may rectify the misallocation and thereby release labour to more productive sectors of the economy, as a result improving overall productivity in the economy and creating a more fluid labour market that can spur growth and innovation.

Broadly speaking, our study will attempt to shed light on whether and to what extent privatisation of SOEs impacts the productivity of “proximate” private enterprises? More broadly, privatization can be thought of as a unique shock that allows for an estimation of productivity spillovers.

**APPROACH AND METHODS**

We propose to analyse the role of state-ownership in distorting the allocation of resources, by utilizing the natural experiments arising from historical privatisation episodes in India. Starting in 1991, India embarked on a series of reforms that significantly reduced state control over industries, including a disinvestment policy that has been followed sporadically through to the
present. Our basic methodology is a Difference-in-Differences (DID) estimation: We will be examining whether districts/state-industry cells that saw a reduction in public sector size due to privatisation (i.e. the “treated” labour markets) experienced a differential improvement in aggregate productivity, relative to districts/state-industry cells in which public sector presence remained unchanged.

MAIN FINDINGS (IF APPLICABLE)

N/A

POLICY IMPLICATIONS

N/A
Improving Entrepreneurs’ Managerial Capital and Access to Information in Low Income Countries

**Institution:** London Business School  
**Principal investigator:** Naufel Vilcassim, Pradeep Chintagunta, Stephen Anderson-Macdonald  
**Research status:** Ongoing

**RESEARCH MOTIVATION**

Policymakers have long extolled the virtues of entrepreneurship and its potential to stimulate economic and financial development. The rosy view of entrepreneurs as growth agents, however, overlooks critical challenges in entrepreneurship in developing countries. The reality is that developing countries tend to be dominated by millions of tiny businesses that do not grow into larger firms (Schoar 2010). The entrepreneur-owners of these micro and small sized enterprises operate with a handful of employees and with limited odds of economic advancement (Banerjee and Duflo 2007; Collins et al. 2009). In fact, for males and females alike, the majority of entrepreneurs in developing countries tend to be subsistence entrepreneurs who: have minimal business skills, lack access to information, are focused on basic survival, and start firms because they cannot find jobs in the formal sector (Schoar 2010; Tokman 2007). It is therefore important to distinguish between subsistence entrepreneurs (i.e. more common businesspeople) and transformational entrepreneurs (i.e. in the Schumpeterian sense of ‘innovator’). Focusing on the latter, transformational entrepreneurs with the greatest potential to scale their businesses, offers the tantalizing prospect of a way out of poverty – not just for the micro entrepreneurs themselves, but for those they hire, those they buy from, and those to whom they might serve as role models (King and Levine 1993; Schoar 2010).

Given this situation, researchers and policy makers have been examining how to lift certain constraints in hopes of enabling micro and small entrepreneurs to enhance performance and stimulate inclusive growth, which has the potential for both broader impact (e.g. economic and social outcomes) and deeper impact (e.g. creation of decent jobs and sustainable household well-being). Particular attention has been given to enhancing financial capital (credit, savings, cash, or in-kind grants) and its impact on business growth (Banerjee and Duflo 2008; de Mel, McKenzie and Woodruff 2008; Dupas and Robinson 2010; McKenzie and Woodruff 2008). However, after two decades of government and NGO efforts, the empirical evidence on micro-finance solutions suggests they might not be the miracle remedy (at least not in isolation) that can help micro and small entrepreneurs to scale up their operations and transition into larger firms (Banerjee et al. 2010; Schoar 2010). Thus, researchers are now questioning what other forms of “capital” are missing in developing countries (Bruhn, Karlan and Schoar 2010).

One recent suggestion for addressing this missing capital issue might, in retrospect, seem obvious: provide business training or consulting services that can enhance managerial capital (Bloom et al. 2010; Bruhn, Karlan and Schoar 2010; Bruhn and Zia 2012). Yet surprisingly, there has been very little research in developing countries on managerial capital, which we define as the capabilities and confidence associated with managing cash, customers, competition, capital and constraints within businesses (cf. Bruhn, Karlan and Schoar 2010; Bloom and Van Reenen 2010). Our research proposes not only that managerial capital is a key driver for helping micro and small enterprises to transition into larger firms, but also that different dimensions of managerial capital (e.g. finance, marketing or operational skills) can be developed through
consulting programs focused on implementation of a business growth project by individual entrepreneurs.

Further, the importance of improving entrepreneurs’ access to business information should not be ignored (Bloom et al. 2010, p.620). It is difficult for an entrepreneur to fully benefit from a consulting program if she does not have access to the metrics and analytics (business intelligence) needed for understanding her business context and constraints. Thus, practical and easy to use information communication technologies (ICTs) for smaller firms offer an opportunity for improving the business intelligence available to even the poorest entrepreneurs and, in turn, enhancing firm productivity and stimulating economic growth.

RESEARCH QUESTIONS/HYPOTHESES
The main aim of this research project is to evaluate the drivers and economic and social outcomes of small business growth through an enterprise development programme focused on consulting and technology for growth-oriented entrepreneurs. We aim to contribute to the existing literature on entrepreneurship, managerial capital and access to information and answer the research questions outlined below.

On identifying higher growth-oriented
1. Can ‘high growth potential’ entrepreneurs be identified and nurtured?
2. What are the backgrounds and characteristics of these growth-oriented entrepreneurs – and do they possess higher levels of managerial capital ex ante?
3. Does greater selectivity in the recruitment of (growth-oriented) candidates for managerial capital programs (and other small business support services) offer greater potential for impact?

On access to consulting
4. Will a business consulting program for micro entrepreneurs lead to increased economic outcomes (e.g. firm sales, profits, employees) and social outcomes (e.g. household investment in food, health, education)?
5. Can a more intense and focused intervention, in which the participants concentrate on only one growth project (e.g. developing a marketing strategy) for six months, help entrepreneurs overcome the inertia that is inherent whenever there are pre-existing habits or low confidence?
6. Do the marginal effects of specific consulting programs differ depending on gender (female versus male), the size of firm (micro versus small), or other entrepreneur or business characteristics?

On access to business information through innovative ICT tools
7. How can access to business information be improved in developing countries – and in a scalable way?
8. Will improving entrepreneurs’ access to business information via innovative technologies (ICTs) result in productivity gains and firm growth? If so, how?
9. Will improved business intelligence in specific business functions (e.g. finance- or marketing-related information) have differential impacts on business performance? For example, will providing information and analytics on a firm’s marketing practices lead to improvements in top-line growth? If so, do the marginal effects of specific business information differ depending on gender (female versus male), the size of firm (micro versus small), or other entrepreneur or business characteristics?

APPROACH AND METHODS
To address these research questions, we will implement two randomised controlled trials (RCT) to evaluate the impact of a consulting programme aimed at building managerial capital, and an innovative
business information technology tool that enables entrepreneurs to track and manage key metrics about their businesses. The RCTs will be conducted concurrently in Uganda and Rwanda with a more homogeneous sample of growth-oriented entrepreneurs. Prior to the study interventions, a previously tested screening survey will be conducted to identify a sample of 1,200 established and growth-oriented entrepreneurs in and around the greater Kampala (n=600) and Kigali (n=600) metropolitan areas. Next, participants will be randomly assigned to receive one of two interventions:

**Uganda: Managerial Capital**
1. Group 1 (treatment): 600 entrepreneurs will be offered a high quality consulting programme provided by Grow Movement. This managerial capital intervention represents a novel model for delivering free, high quality business advice to entrepreneurs in the world’s poorest countries via emails, mobile phone calls and Skype video conferencing; and
2. Group 2 (control): 400 entrepreneurs will form a comparison group that does not receive any intervention during the course of the research project (note: they will be given access to the consulting program after the project ends).

**Rwanda: Access to Information**
1. Group 1 (treatment 1a): 500 entrepreneurs will receive the “MONEYmanager” tool, an information technology tool that allows them to track key business metrics related to their business finances (e.g. revenues, costs, profits, etc.). This easy-to-use information management tool will leverage SMS technology and is designed to increase entrepreneurs’ access to – and ability to act on – information about their own business practices and performance;
2. Group 2 (treatment 1b): 500 entrepreneurs will receive the “MARKETmanager” tool, an information technology tool that allows them to track key business metrics related to their marketing practices (e.g. customers, prices, best-selling products, advertising, etc.);
3. Group 3 (control): 500 entrepreneurs will form a comparison group that does not receive any intervention during the course of the research project (note: they will be given access to the business information tool after the project ends).

After completing the study interventions, all 2,500 entrepreneurs will have their business practices and performance outcomes measured using post-intervention surveys conducted at month 6 (midline) and 12 (end-line).

**MAIN FINDINGS**

This research is still ongoing. Results will only be available in 2017.

**POLICY IMPLICATIONS**

This research is important to policy makers wishing to stimulate income generation and employment among the poor in developing countries, most of who either run or work in a micro/small enterprise. Through this research, we first seek to understand whether high-growth potential entrepreneurs, those more motivated and able to grow their firms (and therefore more likely to benefit from entrepreneurship support programs), can be identified and nurtured. Second, there is still much to learn about the role of business education services (e.g. consulting) and business intelligence tools in stimulating economic growth in developing countries, as well as how these interventions improve firm productivity and performance. Understanding how to deliver such programs cost-effectively, and to the right entrepreneurs, could lead to more effective use of scarce funds available for poverty alleviation.