



**International
Growth Centre**

RESEARCH STRATEGY



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The International Growth Centre (IGC) aims to promote sustainable growth in developing countries by providing demand-led policy advice based on frontier research.

DIRECTED BY



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Executive Summary

The IGC funds high-quality research relevant to growth policy in developing countries. This document lays out the strategy that underpins this research and what follows builds on the Phase I Research Strategy. The IGC Research Programme was conceived to help generate a richer understanding of the process of economic growth and the required policy and institutional interventions that support it, and by doing so, to also promote economic growth in developing countries. The programme broadly delivered on these goals during Phase I by commissioning roughly 130 high quality studies through five calls for proposals, achieving brand name recognition, encouraging the participation of top researchers, and making significant progress towards integrating the work of researchers and policy-makers in developing countries.

In Phase II, the IGC will build on these successes and streamline the Research Strategy with a sharper focus on key research questions that are relevant for growth within four broad themes: (i) state effectiveness, (ii) firm capabilities, (iii) cities, and (iv) energy. These are themes where we have seen demonstrated demand during the past few years and where there are large knowledge gaps in the existing literature, thus providing us with an opportunity to both push out the global knowledge frontier and to influence policy. They also represent themes where our research network has been successful in commissioning research that matches policy demands. Finally, these are areas where the IGC has begun to establish a global reputation and where we feel there is scope to cultivate our global competitive advantage, thus putting us in a better position to influence both national and international policy debates. Answering these questions will help us push the frontier of economic research and help inform growth policy around the world.

The first of these themes is state effectiveness. This focus stems from the realisation that without a functioning state that implements policy to enable individuals and firms to become more productive, a large fraction of humanity will continue to be consigned to poverty. Under this theme we will investigate how to increase the capacity of the public sector to deliver the public goods necessary for firms to grow, as well as ways to help the state raise the resources necessary to its functioning.

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Sustainable increases in income are not feasible without sustainable increases in productivity. Understanding how to increase productivity is thus at the heart of improving incomes and driving economic growth. This leads naturally to a focus on firm capabilities, our second thematic area. Our research will investigate the causes of the large dispersion in productivity across firms, as well as on making smaller firms more productive, encouraging entrepreneurship, and engineering productivity increases in rural areas.

In developed countries, the bulk of economic wealth is generated by people and firms operating within a small number of cities, therefore calling for substantial research to be done on the management of urbanisation in order to make cities more productive. The research in the cities theme will be focused on understanding the local factors that matter for a country's growth, as well as optimal location specific policies.

Finally, how to satisfy industrial and domestic energy needs has become a growing concern in a number of our countries as energy shortages are often seen as a major hindrance to economic growth. Access to reliable power not only allows firms to grow in scale and productivity, but also for internal and external trade to expand and for agglomeration in the form of towns and cities to proceed. Providing frameworks and knowledge to inform countries on how to sustainably and efficiently satisfy growing energy demands is therefore the fourth research theme of the IGC research programme.

In each of these four thematic areas, we specify research questions that will guide the first call for proposals for the IGC Research Programme in 2013. This open proposal, which will be widely disseminated to the IGC research network and made available to all interested researchers, will provide an opportunity to select projects that push the knowledge frontier on these themes. Our updated research management framework, which includes improved funding procedures, a more concrete strategy for engagement with stakeholders and dissemination of research findings, better engagement of local researchers and scale-up evaluation and monitoring efforts, will further contribute to enhancing the influence of the IGC research programme and allow us to maximise our achieved impact.

1. Introduction

The International Growth Centre funds high-quality research relevant to growth policy in developing countries. This document lays out the strategy that underpins this research and what follows is a major revision of the original Research Strategy approved in 2009.

The IGC Research Programme was conceived to help generate a richer understanding of the process of economic growth and the required policy and institutional interventions that support it and in doing so, promote continued development and economic growth in developing countries. The programme has broadly delivered on these goals during the past four years. It has commissioned roughly 130 high quality studies through five calls for proposals, achieved brand name recognition, encouraged entry of top researchers, and made significant progress towards integrating researchers with policy-makers in IGC partner countries. The core belief that effective policy impact requires long-term country engagement with policy stakeholders whilst leveraging a pool of quality academic expertise and in-country knowledge continues to guide the vision of the programme.

The transition to the next phase of the IGC provides an ideal opportunity to restructure and refocus the IGC Research Programme. In doing so, we have utilized four considerations:

1. There has been demonstrated demand during the first four years of the IGC from partner and non-partner countries for the work covered by the focus themes. It is therefore critical to have sufficient breadth in the focus themes to cover growth policy demands that have repeatedly emanated from partner and non-partner countries during the first four years of operation.
2. The IGC Research Programme focus themes should fill in key knowledge gaps where existing research is thin but where demands from partner and non-partner countries reveal that there is a need for such knowledge.
3. We will continue to draw on the services of Research Programme Directors (and the members of their programmes) that have, in the past, demonstrated the necessary energy, leadership, and convening power to create research portfolios which respond to country demands and fill in knowledge gaps.

4. In Phase II, we will refocus the IGC as a whole around a narrower set of themes, which is where the IGC will cultivate its comparative advantage in. This is required so that the IGC can become more influential not just within in-country domestic policy circles, but also within global policy debates.

Section 2 of this document outlines the four focus themes of the IGC Phase II Research Strategy: (i) state effectiveness, (ii) firm capabilities, (iii) cities, and (iv) energy.¹ Narrowing the focus of the IGC Research Programme should increase the impact of the research produced and make it easier to manage. Going forward, the Research Programme Directors will play a central role in commissioning research and in synthesizing evidence from existing research to influence national policy and global debates. They will continue to provide policy advice and feedback to country teams and policymakers as part of their mandate. Since they form the analytical bedrock of IGC work, it is imperative that their contribution is maintained going forward.

Over the course of 2013, the IGC will produce a set of evidence papers within its four themes of strategic focus. These papers will draw out lessons based on consolidation of learning from earlier work, compile current evidence, and identify gaps in knowledge on growth policies. They will be used to coordinate the IGC's efforts to build up rigorous evidence on important growth policy questions. Together with this research strategy, these papers will precisely define the structure of the research programme and further streamline IGC research and analytical focus on a smaller set of topics. The IGC will draw from these evidence papers, as well as from demand from partner countries, in conducting future calls for proposals. Going forward, the production and publication of evidence papers on particular areas of growth policy will be a regular activity as the research frontier and country policy experience evolves. These papers will become core publications of the IGC and will be used to influence national and global debates on growth policies.

¹ To see examples of IGC research in each of these four focus areas please refer to the IGC 2012-2013 Annual Report.

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Commissioning under each research theme will be carried out by a board, which will contain representation from both the IGC Research and Country Programmes and from the Steering Group.

Section 3 outlines the restructured management framework of the research programme, including important reforms to allow for improved transparency, quality control, and greater integration between the country and research programmes.

The revised IGC funding strategy will guarantee 'additionality' in three ways:

- It is structured to allow maximum engagement with policy-makers throughout the research process and to ensure that policy decisions can be informed by research and evidence papers, which would not otherwise have been available to policy-makers.
- It will focus the attention of world-class researchers, many of whom have not studied the problems of developing countries previously, to issues relevant to growth policy in developing countries.
- It will forge new areas of collaboration between researchers in the developed countries with those in developing countries.

The IGC's network of country teams will continue to ensure close contact between policy stakeholders and researchers as well as responsiveness to the evolving policy agenda in the focus regions. Section 3 also details the IGC's strategy for engagement with policy-makers and local researchers, as well as our new monitoring and evaluation procedures. Together with the funding strategy, these elements comprise the operational foundation that will ensure that the impact of the research programme is maximized.

2. Areas of Focus: An Agenda for Growth

When we discuss growth policy, when we talk about countries where GDP has gone up or down, when we marvel at countries undergoing export booms, it is sometimes too easy to overlook the obvious point that the key force behind all of these are people and firms. What drives growth is simply the processes by which people with ideas start firms; some of them turn out to be successful because they are able to deliver products for which global customers want to pay. When this happens systematically for a large number of firms, growth takes off. This, in a proximate sense at least, is what has happened in some countries, such as China and India, but has also failed to occur in many countries around the world.

Obviously many things need to happen for these processes to take place. The research work in Phase II of the IGC will be focused on what we believe are the four key ingredients of an economy where a large number of firms are capable of producing world-class products and providing high-quality jobs to a large proportion of a country's population.

First, a sine qua non is a state capable of raising revenues and providing key public goods, such as infrastructure and rule of law, but that also uses these capabilities towards improving overall productivity and welfare rather than benefitting vested interests. In the last four years, the IGC has pioneered research on how to create an effective and accountable state and also on defining the dimensions of such an effective state that matter most. We will continue to build on this work.

Second, we seek to understand the sources of the productive potential of all firms within an economy, be it large formal firms, small informal firms, large commercial farms, or small-scale family farms. Some of this productivity may be due to the quality of the policy environment provided by the state, but we suspect that most of it is more subtle. Understanding firm capabilities, in all its incarnations, and the allocation of resources to these firms, will be a priority for the IGC.

Third, we will investigate the reasons why the most productive firms are located in cities and attempt to find out the best ways to manage urban growth. As the world becomes increasingly urbanised, the importance of high-quality public goods and urban infrastructure increases in relevance, and we are interested in studying these factors that impact city growth. Our focus on cities will also more generally cover regional development policy.

Finally, recognizing that a lack of energy access is a key impediment to economic growth, we intend to study the best and most sustainable ways to improve electricity access both in areas already covered by national grids and also in rural areas yet to be connected. We also wish to investigate the ways in which investments in energy efficiency can promote growth, as well as the best strategies to minimize the externalities that inevitably arise from energy expansion and intensification.

2.1. State Effectiveness

It seems clear that the public sectors in a sizeable number of developing countries fail to provide many, if not most, of the critical public goods without which firms cannot grow. In many countries, the public sector has limited capacity to raise revenues, appears to do so in a very distortionary manner, and fails to spend what it does collect effectively, leading to failures to deliver necessary public goods, such as law and order, water, electricity, roads, schools, and general institutions that are conducive to the growth of healthy firms. In turn, this weakness might reflect weak political institutions and pervasive conflict. Under the state effectiveness theme, we will focus our research on two questions. (i) What mechanisms improve the capacity to the public sector to deliver the public goods necessary for firms to grow? (ii) What policies help to ameliorate the broader social tensions and political institutions that manifest themselves in the nature of the public sector? This requires an examination of not only public organization and public finance, but also of governance and political economy.

There are two proximate reasons why certain states may not deliver public goods. First, it may not be able or willing to deliver the goods. Second, the state simply may not have the resources to deliver the necessary public goods, say because of widespread tax evasion or an excessively narrow tax base. Firms do not grow because public goods such as law and order and infrastructure are not present. They also may voluntarily choose to restrict their growth because the state, in the presence of widespread tax evasion, may concentrate taxation on large firms.

The first question then concerns how to develop the administrative capacity of the state to deliver public goods. One reason for the current failures to deliver these goods may be because public sector workers are not properly monitored and incentivized. To examine the hypothesis, the IGC has funded research that explored the effect of changes in incentives and increased monitoring on tax collectors in Pakistan (Khan, Khwaja and Olken 2013). The IGC has also funded ongoing research

that examines the use of social norms in Bangladesh to improve the state's fiscal capacity and also on changing the incentives of bureaucrats in Zambia. Other work has shown that disclosure of information to the public (Reinikka and Svensson, 2004, 2005) and to superiors in the bureaucracy (Callen, Gulzar, Hasanain and Khan 2013) can have significant effects on the actions of mid- and low-level officials. Reforming public procurement, where wastage of public funds is often significant, is another area where IGC research is ongoing.

While the findings are promising, this research only scratches the tip of the iceberg of possible solutions to the problem of addressing these states' insufficient capacity to adequately deliver public goods. For example, there are major questions in public organization which concern not only how to incentivize existing bureaucrats but also how to select individuals who are best suited to the tasks they need to perform. There is a lot to be potentially learned from the organizational structure of large private firms in terms of how they recruit, monitor, and incentive their employees and on how to adapt the best practices from the private sector to the public sector.

We would also like to broaden the areas of public good provision that IGC research examines. For example, the capacity of the state to enforce laws and prevent crime, to support a judiciary system that enforces contracts, and to support a financial system that allocates capital to rapidly growing firms are areas where reforms of public organization could have significant impacts on economic growth. The changes that these types of reforms might have on the implementation of policies to encourage economic growth are likely to be highly significant and rethinking public organization in developing countries is a key area where the IGC would like to encourage new research.

The second and related question connects to improving the ability of the state to raise resources. Without this ability, the state is unable to make the necessary investments to foster growth (Besley and Persson 2011, 2013). In basic terms, a low tax take relative to GDP limits the ability to provide the public goods that underpin growth. As Besley and Persson (2013) put it: "The central question in taxation and development is: 'how does a government go from raising around 10% of GDP in taxes to raising around 40%?'" Tax bases in developing countries are often narrow and distortionary and we would like to see research which examines how bases can be broadened in a manner that encourages firms to grow in size. This requires work on the overall design of tax systems as well taking on issues connected to exemptions and compliance

which can have a major bearing on how much revenue the state can raise. We therefore want to sponsor research on tax policy and optimal tax design as well as work on the determinants of fiscal capacity and on ways to improve it. Issues such as tax evasion, avoidance, and informality are central here and we hope to sponsor research on policy measures to reduce these deficiencies (e.g. tax audits, penalties, third-party reporting and information trails, social incentives and norms, linkages to financial sector). The IGC has done a considerable amount of work in this area (see e.g. Kleven and Waseem 2013), but it remains heavily under-researched and, given its centrality to economic growth, it will be a core area for IGC research going forward.

In the public finance area, we would also like to encourage research on fiscal issues connected to natural resources, such as how best to tax these resources. But there are also major research questions surrounding whether resource rich countries should save or expend the flow of revenue emanating from these resources. For countries where resource exports are a major share of GDP, fiscal management of the flow of value from natural resources will have a central bearing on whether or not the state has sufficient revenue to provide the public goods that underpin economic growth in the future. This has implications for whether the economy remains narrowly reliant on natural resources or engages in more broad-based industrialization. The location of natural resources and whether or not revenues flow into public good provision will also affect the growth of cities and the pattern of development within a country. The manner in which natural resources are exploited will also affect whether countries can generate the energy that firms need to enter and grow within key industrial sectors. Linkages between natural resource management and the overall development of a country is an area where we would like to sponsor further research. Providing the frameworks and knowledge to inform countries on how to make best use of their natural endowments, set up effective governance arrangements, deliver tangible benefits to their citizens, and satisfy their growing energy demands is a key priority going forward.

Turning to the broader institutional design, the public sector may also not be organized in a manner optimal for delivering public services. For example, the state may currently be run centrally from the capital city while a more decentralized structure may prove more accountable. If ethnic divisions exist, different groups in different regions may not feel adequately represented, and this may lead to dysfunctional politics and ethnic conflict. Furthermore, the way that administrative and political powers are shared between differing levels of government may not be

optimal, especially so if significant resource disparities exist across regions. Improved understanding of the processes of local decision-making is needed if the promise of decentralization as an avenue to increase the accountability and efficiency of the state is to be fulfilled. But here again, we believe that the range of possible institutional designs currently under discussion only scratch the surface of the possibilities for achieving the desired optimal outcomes. In broad terms, our goal is to support work that examines existing institutional structures and come up with new institutional designs for the public sector.

The discussion so far has assumed that the principal political actors want to “do the right thing” but are stymied by inefficient institutions or unmotivated and corrupt bureaucrats. However, there is abundant evidence that many politicians do not act in the interest of the public they are supposed to represent. The result is often very poor provision of public goods and low rates of economic growth. In developed countries, the main mechanism to guard against this are elections. While many developing countries also have elections, these elections have proven to be a less effective mechanism for this. There is thus considerable scope for more research on the elements that are contributing to the ineffectiveness of elections in developing countries.

For this reason, research on electoral accountability in developing countries is a priority area for the IGC. A first specific question in this area of research pertains to the role of information in elections; is it true that lack of information is a binding constraint in keeping corrupt and underperforming politicians in office? Another question pertains to the prevention of election fraud and intimidation, and particularly to the implementation of new methods of ensuring free and fair elections. It is also important to better understand the incentives that lead elites to engage in different types of election manipulation. As part of this research area, we also want to explore further the extent to which ethnic voting weakens the basic mechanisms of accountability. We will explore new methods for ensuring free and fair elections as well as research the conditions under which ethnic or regional identity may weaken these electoral institutions.

The extent of political accountability in developing countries also depends on the “political culture” of the citizens that inhabit these countries (Robinson 2009; Eifert, Miguel and Posner 2010). One dimension where this is true is the extent to which citizens identify with their nation. Another dimension is the acceptability of behaviours

that are detrimental to society. Poorer countries display, on average, higher acceptability of corruption as a norm in society, which can act as an obstacle to governance reforms. Stemming from this realization, we want IGC research to provide answers to some key questions. How can the beliefs and expectations of poor people be changed so that they demand more from their leaders? How can nations “invest” in the political capital of their citizens so as to ensure sustainable institutional and economic development? What are the sources of pro-social behaviour across societies or communities, and how can this behaviour be encouraged? What is the role played by the media in this respect, and how do social networks and social organization shape citizens’ beliefs? These are ambitious questions ultimately aimed at creating the environmental conditions for institutional reform to deliver benefits in terms of increasing economic growth.

In the area of governance and political economy we also want to sponsor research on conflict and ethnic politics. We want to better understand the mechanisms through which conflict and ethnic divisions affect economic growth. Much of the existing research has focussed on the causes of conflict and, in particular, the role of economic shocks in conflict (see Blattman and Miguel (2010) for a review). Many of the effects on growth from both conflict and ethnic divisions are likely to operate through investment or through the misallocation of public goods. Due to these factors, firms may decide not to set up in affected areas leading to depressed economic activity over prolonged periods of time. Civil conflict can be understood as a dramatic example of institutional failure and we would like to sponsor research on how such failure can be prevented.

2.2. Firm Capabilities

Sustainable increases in income are not feasible without similar increases in productivity. Understanding productivity improvements is thus at the heart of increasing incomes and driving economic growth. It is axiomatic that prosperity depends upon the underlying productivity of all firms in the economy. This is the case whether we are looking at large formal firms, small informal firms, large commercial farms, or small-scale family farms. This raises three important questions. (i) What are the key proximate determinants of firm productivity? (ii) Where does the productive capacity of firms come from? (iii) What are the barriers that prevent resources from moving from unproductive firms and sectors to areas of higher productivity? Research under the firm capabilities theme will be focused on these questions. In addition to our focus on larger firms within the manufacturing and service sectors, these research questions reflect the fact that the majority of citizens in developing countries are employed in unproductive small firms (including farms), resulting in an urgent need to think through how to make these firms more productive and also how to encourage the transition of workers into more productive sectors.

To begin, a key ingredient in this research is the development of data on firms and markets and research on measurement methodologies. For example, one of the key outputs from the first phase of the IGC is a set of “enterprise maps” compiled by John Sutton and co-authors in Ethiopia, Ghana, Tanzania, and Zambia. These maps are based on detailed original surveys of the fifty leading firms in each of these countries. We have learned a great deal from these and will continue to support similar original data gathering work, but will also put priority on bringing existing data to researchers. We will work with the IGC country programmes to leverage connections with government ministries, trade associations, and large firms with an eye to making existing data available more broadly within the research community.

Based on this data, our goal is to understand the proximate determinants of differences in firm productivity. IGC funded work by Bloom and co-authors (2013) looking at the process of productivity improvements among textile firms in India, and on-going work by Bandiera, Guiso, Prat and Sadun (2011) analysing the use of time by CEOs in India and other countries are examples of this type of work. Another example is the measurement of the extent of the centralization of decision making within firms, perhaps because of constraints on the owners’ time. On the trade dimension, we have some preliminary evidence that the composition of products – moving away from

commodities and low-quality goods towards higher value manufactures – constitutes an important dimension of productivity and growth.

More broadly, by conducting new surveys and combining the information from these surveys with data from existing datasets (including those we hope to be able to bring into the public domain), we can measure forces that may be important in determining a firm's capabilities. Although elements such as the use of specific technologies and access to inputs are sometimes measured in agricultural surveys, such information is rarely collected in surveys of industrial firms. Specifically, many of the most important determinants of a firm's capabilities – such as knowledge, access to global productivity chains and input markets, use of specific technologies, quality of products, contracting relationships between different firms – are rarely observed in datasets of industrial firms large enough to permit statistical testing. One of the IGC's goals is to change this in the future through further work and research.

In addition to aggregate measurement, we also need to develop new methodological approaches to measure productivity at the firm level. Although the measurement of productivity at this level is the subject of a large academic literature, the standard methods for estimating productivity often assume away exactly the sort of heterogeneity that we believe might be important in the countries the IGC operates in. The IGC will thus support research that develops new methodologies to construct appropriate measures of the drivers of firm productivity from existing data.

At the same time that we deepen our understanding of the proximate determinants of firm productivity, we also need to understand the sources of these differences. Put simply, if management quality is important, why are some firms better managed than others? If access to export markets is critical for productivity, why don't more firms export? If new high-yield seeds or mechanization dramatically improve productivity in the agricultural sector, why don't more farmers adopt these new seeds or technologies?

Research on these topics has been sparse so far, but partly based on research that the IGC has conducted, we have some hypotheses on the forces that might matter. The enterprise maps by John Sutton suggest that the origins of successful firms in developing countries may be quite different than in more advanced countries. Specifically, Sutton's research finds that few of the leading firms in these countries originated as small firms, rather they are more likely to have been started by entrepreneurs engaged as brokers in foreign trade. We want to know whether this

finding holds more systematically in other countries as if it is indeed the case, it suggests that something is failing in the entrepreneurship process. Specifically, this failure lies in that very few entrepreneurs manage to grow, almost as if the equivalent of Google in Sub-Saharan Africa never grows beyond the proverbial garage (or living room). We do not know what forces are behind this pattern (assuming it holds up), but we suspect that access to output markets and access to critical inputs such as capital, skills, imported intermediate goods, seeds, and fertilizers (for farmers) may be critical. Understanding what the key forces are is obviously critical, but at this time there is a lack of evidence on the importance of most of these main suspects.

However, due to the research that the IGC funded in Phase I, we know that the magnitude of internal trade barriers does have a potential effect on the growth of firms. Specifically, Atkin and Donaldson (2012) show that internal trade barriers may be very large in poor countries. In the agricultural context, IGC-supported research suggests that lowering transportation costs in Sierra Leone led to large gains among farmers and also improved competition amongst traders by reducing search costs. In the industrial sector, there is currently little evidence on whether internal trade costs might have similar effects on firm productivity. However, it seems likely that if access to input and output markets is critical for modern industrial firms, costs that make it more difficult for firms to access these networks will affect the incentives of firms to invest in firm productivity. If these effects turn out to be large, this will further emphasize the significant gains to be had from further integrating these input and output markets.

Another force that is likely important in shaping firm productivity is market competition. In countries such as the US, the data paint a picture of a vibrant private sector, with pressure leading to a Darwinian survival of the fittest rife with Schumpeter's "creative destruction". There are no comparable comprehensive studies of productivity dynamics in low-income countries. But recent evidence suggests that markets in low-income countries exert much less pressure on incumbent firms. Bloom and Van Reenen (2010) show there is substantially more dispersion in management practices in India and China than in the United States and northern Europe. Hsieh and Klenow (2009) present evidence showing that there exists more dispersion in total factor productivity in India and China than within the United States. By either measure, we see a much thicker left-hand tail of low-productivity firms surviving in China and India. Casual observation suggests that productivity dispersion is also very high in sub-Saharan Africa and other low income countries, though a lack

of data has made formalising this claim a challenge. The IGC will give high priority to addressing this challenge in the future.

If we find that markets do not exert the same pressure on firms to improve productivity, the next question is why should this be so? A well-established literature shows the role of underdeveloped financial markets and regulatory barriers in suppressing entry, but differences between markets in high-income and low-income countries are much broader and more fundamental than finance and entry costs. For example, there appears to be greater reluctance in low-income countries to switch trading partners, even for standardised products. Information about the reliability of firms and products often remains poor and not easily available. Formal legal remedies for contractual non-compliance are slow, expensive, and unreliable. Furthermore, decision-making is more centralised because owners are unwilling or unable to delegate responsibilities outside of a narrow circle, often limited to family members.

Our goal is to make progress on this question in the second phase of the IGC. As an example of IGC research in progress on this question, an innovative project among firms producing soccer balls in Pakistan seeks to examine the effect of an introduction of a new method for producing soccer balls on learning and firm productivity. Although this research is preliminary, it has already led to the development of an innovation fund sponsored by the government of Punjab to spur innovation among firms across all sectors in Punjab.

The structure of the market for inputs and outputs may also play an important role in addition to its incentive effects on productivity. In the IGC's previous work in Sierra Leone, Rwanda, and Pakistan, our research has shown that the market structure of the agricultural supply chain has important effects on prices and thus farmer welfare. IGC research in Ghana and India also shows that the availability of insurance led farmers to invest more and also served to establish the existence of a demand for agricultural insurance in some regions. We suspect that other critical inputs are also missing and that similar forces are at play in the industrial sector. Specifically, uncompetitive input markets may increase prices and make critical inputs scarce, which have large potentially adverse effects on firm performance. In the agricultural sector, inefficient firms in sectors that sell seeds and mechanical farming equipment could explain why so many farmers still use primitive technologies. In the industrial sector, the inefficient electricity sectors in India and Pakistan (and many other countries), the absence of functioning markets for land and office space in urban

areas, and the inefficient transportation sector might be behind why many firms remain small and unproductive. Again, more research is required to accumulate the necessary systematic evidence to rigorously approach these questions.

We also have evidence that the clustering of firms, particularly in industrial sectors, produces positive externalities that are important for capturing local spillovers and fostering industrial development. One of the important spillover effects of this is in knowledge: firms may learn from their neighbours, either directly or by hiring workers from nearby firms. Careful research has been done to advance our understanding of such externalities, but the theoretical and econometric challenges remain formidable, especially within developing countries. One key issue is the extent to which knowledge spillovers occur from investment by multinational corporations. These potential externalities opens up the possibility of welfare-improving public interventions. Evaluating industrial policies is challenging since they differ widely across sectors and countries and there are typically no clear counterfactuals for comparison. We will seek to expand the evidence base on the effects of industrial policies, to move beyond journalistic accounts and case studies, and to provide a solid empirical grounding for policy discussions on the topic.

The last pillar of the research on firm capabilities encompasses understanding the importance of and barriers to effective resource allocation. There exists suggestive evidence that an important part of the growth process is driven by the emergence of new firms and sectors as well as the reallocation of resources from less productive to more productive firms. For example, research by John Sutton funded by the IGC shows highlights the high importance of large firms to the aggregate exports of the manufacturing sectors within many Sub-Saharan African countries. To take another example, more of the IGC's previous research illustrates the transformative effects of certain sectors, such as the flower industry, in countries like Kenya and Ethiopia. More broadly, we want to understand the importance of the reallocation of resources from informal to formal firms in manufacturing, from non-exporters to exporters, from small family owned farms to large corporate farms, and from agriculture to industry.

The reality in many countries is that this necessary resource reallocation does not take place, resulting in industrial sectors being dominated by a large number of small, unproductive, informal firms. In the agricultural sector, the vast majority of land and people are employed in small subsistence farms, despite the presence of potentially more productive farms producing cash crops with modern technologies. Furthermore,

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workers and capital remain locked in less productive agricultural sectors, while it may be the case that these resources could be more profitably employed in other sectors. What are the barriers that prevent the efficient reallocation of resources? What prevents subsistence farmers from moving into cash crops or into urban industrial sectors? We have a long list of candidate explanations, but there is currently little evidence of which explanations hold the most empirical water. The research undertaken in the coming years will serve to shed light on these questions.

2.3. Cities

So far, we have discussed firms and governments without taking location into account. Yet, in developed countries, the bulk of economic wealth is generated by people and firms operating within a small number of cities (Overman and Venables, 2008). As a result, many governments attempt to influence this process via policies that affect the location of economic activities. Research under the cities theme will be focused on two questions: (i) Why does location matter for a country's growth? (ii) What might be optimal location-specific policies?

A long-standing question in urban economics is why economic activity in developed countries is so concentrated geographically? Why do firms choose to operate in locations where the cost of doing business is among the highest in the country? And why do people choose to live in regions where the cost of living is among the highest? The answers to these questions must lie in the fact that firms choose to locate in cities, despite the higher costs, because the nature of cities is fundamental to their productivity. We do not completely understand why cities are so important, but it seems plausible that cities create business "ecosystems" where firms can obtain the specialized inputs they require, enjoy easier access to their customers, where knowledge and ideas "spill over" across firms, and where skilled workers are located because of their desire for urban amenities and opportunities. Regardless of the underlying reasons, all the evidence indicates that without effective cities, it simply would not be possible to generate sustained growth (Joshi-Ghani, Glaeser and Moretti 2013; World Development Report 2009).

Yet when one looks at a typical city, say in Sub-Saharan Africa or in South Asia, it is hard to escape the view that those cities that are most conducive to firm clustering are also among the world's most dysfunctional cities. Perhaps the best example of this dysfunction is to look at cities such as Mumbai or Lagos that have experienced large increases in their populations. The population increases in these cities must reflect increased labour demand as a result of firm entry or the productivity growth of existing firms. Yet, despite the potential for these businesses to grow, most of them do not.

There are many reasons why firms may not grow, but perhaps it's useful to look at the housing market to illustrate the type of forces operating in cities that might be important.

When one looks at the housing market in such cities, a first order fact is the predominance of slums and informal housing. Slums and informal housing does not imply that the housing is cheap. Although we do not currently have any reliable numbers, it seems likely that when properly measured in quality adjusted terms, the cost of housing in urban areas in poor countries may be significantly more expensive than in many developed countries (Ravallion 2007), certainly relative to per capita income and also, in some cases, in absolute terms as well. Without further measurement, it is not yet clear whether this is the case and this will be a hole in the global knowledge that we will attempt to fill in. Within formal housing markets, where one can observe a market price, some of the most expensive housing in the world is precisely in cities such as Mumbai and Delhi that also have the largest number of slums and informal housing.

If the real cost of housing is high, this matters for at least two reasons. First, firms that want to expand will have to offer higher nominal wages to attract the necessary workers or, in extreme cases, may not be able to locate sufficient numbers of workers at all. Second, the cost of housing is probably highly correlated with the cost of land and other resources that businesses need to expand. If it is difficult to acquire office space or new facilities, firms may be forced to remain small. Both of these factors may act as significant disincentives to the expansion required for the firm-level productivity growth discussed above to take place. Again, this is simply a hypothesis, as further research needs to be done in order to ascertain the relevance of this force.

Why these housing markets operate in this way is yet to be explained. But it seems plausible that there are four critical ingredients of an efficient housing (and business construction) market that are missing in poor countries. First, there is the absence of a housing finance industry. In the UK, building societies played this role in the 19th century. In Singapore and Hong Kong, this role was taken on by governments that invested in massive urban housing projects. Second, there is the absence of a legal structure that provides titles and legally enforces property rights over land and housing (De Soto 2000; Field 2007). Third, the housing and construction industry appears to be quite inefficient, as recent IGC work in Mozambique has pointed out (Marrengula et al. 2012). Finally, local governments simply do not have the capacity or incentives to provide the public goods necessary, be these roads, water, sewage, electricity, or other elements that are important complements to housing (World Development Report 2009). Again, the extent to which these forces are important remains to be investigated.

These same forces are likely to affect other public goods that may be just as important for a firm's growth and productivity. Lacks of water, sewage systems, and reliable electricity all have direct effects on a firm's productivity. In addition, they can negatively affect the establishment of firms producing intermediate goods necessary for growth in the first place. Put simply, can one expect entrepreneurs to set up a semiconductor plant in cities where the power supply goes out for days at a time? How can one attract the skilled workers necessary to build a high-technology industry when the urban amenities are lacking?

This raises difficult questions about the optimal governance structure of local governments. Indeed, it seems plausible that countries where local governments are accountable perform better than countries where local governments are corrupt and where courts are inefficient. However, it also seems likely that the factors that determine the quality of local governments are more complex than simple measures of accountability can capture. In order to better understand these issues, the cities research theme will support research that measures differences in the quality of local governments, especially at the city level. It will also identify national and regional policies that are effective at improving local governance, and estimate the effect that improvements in local governance have on local economic growth, delivery of public services, costs of living, and the distribution of income.

This also raises additional important questions about how to structure regional development policies. Many governments have adopted such policies, partly in an attempt to generate agglomeration economies. We want to understand the extent to which the existing spatial distribution of economic activity in a given country should be modified to maximize agglomeration economies, which IGC research has shown to improve productive efficiency (Burki and Khan 2013). Another oft-encountered regional development policy offers support through infrastructural investment. This, however, leads to difficult decisions. Should national or local governments seek to redistribute economic activity from relatively rich areas to relatively poor ones? Should they focus their development efforts on rich areas instead? If a case can be made for government involvement in infrastructure, then we wish to research the optimal pattern of public investment and find out what types of projects lead to the highest social returns. For example, a popular regional policy, particularly in Asia, has been the creation of Special Economic Zones, which are areas designed to attract foreign investment to a limited number of regions. As part of this theme, we want to find out

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whether these policies can be considered successful compared to alternative policies that extend incentives to foreign investment more broadly to the entire country.

2.4. Energy

It is nearly impossible to overstate the role of access to reliable energy as a critical determinant of growth. The economic history of the developed world tells us that the spread of access to reliable energy played a central role in its transformation into a collection of industrialized societies. Access to reliable power not only allowed firms to grow in scale and productivity, but also for internal and external trade to expand and for agglomeration in the form of towns and cities to proceed. It also enabled small manufacturing and service enterprises to take root and transformed agriculture from subsistence farming into large-scale commercial enterprises.

In contrast, the productive potential of the developing world remains constrained by inefficiencies in the energy sector. It is estimated that well over a billion people remain without electricity and that these are concentrated within the globe's poorer nations, which are the focus of the IGC's work. Per capita energy consumption in the state of Bihar in India, for example, is 0.9% of that in the United States. Additionally, reports suggest that power shortages cost Pakistan's economy about 3% of GDP per annum. Industrialization and the structural transformation of developing countries will thus depend on firms and households gaining access to reliable sources of energy. The immense excess demand for energy in the developing nations implies that they will likely account for nearly all of the growth in energy consumption in the coming years.

The large and important role that access to reliable energy will play in shaping the growth trajectories of developing countries implies that energy will constitute one of the IGC's core research themes going forward. The research that the IGC will undertake in this area will be focused on three questions. (i) How can access to electricity be improved in areas already served by the grid and also in rural unconnected areas in a sustainable manner to enable increases in productivity? (ii) How can investments in energy efficiency promote economic growth? (iii) How can the external costs associated with rising energy consumption be minimized?

Two features characterise energy markets in developing countries. The first is that households and firms that are connected to national grids often experience unreliable and intermittent service. The second is that many households and firms remain unconnected to a nation-wide electricity grid. These features are largely the result of insufficient investment in national energy grids, adverse incentives and inefficient policy frameworks.

Most existing industrial and domestic consumers of electricity are located in cities and towns. Irregular and unpredictable access to electricity severely impedes the ability of households and businesses to adequately plan and make the investments that are the foundation of growth. The adverse effects of this unreliability of energy on household and firm productivity are as varied as they are obvious. The inability to fully utilize electricity-dependent inputs, for example, provides a significant disincentive to invest in productivity-enhancing technologies and production methodologies. Our evidence base is weak here, however, the consequences for the productivity of not only households and firms but also cities and regions, is likely to be significant. Unfortunately, erratic supply of electricity is the norm rather than the exception in the majority of countries where the IGC works.

This, in part, reflects the inability of distribution companies to provide regular service because they are unable to recoup the costs of the electricity generation. In India, for example, as much as half of the power drawn from the grid is not paid for and losses of distribution companies exceed 1% of GDP (Wolak 2008). This results in a situation where distribution companies are loss making (and hence unable to invest in upgrading energy infrastructure or in expanding access) and where households and firms pay little or nothing but are not getting the electricity they need to power their economic activities.

The electrification of rural areas presents a particular challenge as the costs of reaching households and firms is often higher and their ability to pay lower. However, where access can be achieved, the effects can be transformational in terms of increasing the productivity of local entrepreneurs, vendors, and farmers (via access to more efficient production, communication, storage, and technologies) and by increasing the productivity and welfare of households via facilitating the reallocation of household time, income generation and greater economic specialization (e.g. Khandker et al. 2012; Martins 2005; World Bank 2008). Unfortunately, despite the potentially significant gains in welfare for large portions of the population, much of the rural areas of developing countries are still yet to be electrified. This can be clearly seen in night images where areas between cities are often black. Many of the challenges faced are similar to those for urban consumers but for remote consumers where extending grid infrastructure is not cost-effective off-grid solutions to energy provision may need to be sought.

Under the energy theme, we will therefore focus on questions concern facilitating investment in the expansion of access and quality. This has to do with improving incentives for industrial and domestic consumers to pay for the energy they use as a means of generating resources for improving quality and expanding access. Understanding pricing and the willingness to pay for reliable access is critical here as is understanding whether private valuations exceed public valuations. We want to examine whether energy policy can be designed to reduce non-payment and prevent theft in order to increase efficiencies in the sector. This includes the question if it is possible to reduce non-payment and theft by shifting social norms and expectations around payment, either with carrots (service quality, easier payment modes) or sticks (disconnections). For remote rural households and firms this may require examining off-grid solutions including mini-grids, wind and solar.

This set of questions leads naturally to a set of questions on the impact of improving access and quality on households and firms. This will require examining what changes occur at the household level, for example, does access to power release peoples time so that it can be devoted to productive activities? Does income and consumption improve as a result? Another important question concerns the gains in productivity for small and large firm from increasing high-quality grid access, and how these affect labour and product markets and the process of structural change and urbanization within an economy. No less important are questions relating to the general equilibrium effects of expanding energy access in terms of enabling new production technologies, promoting trade, and fostering agglomeration.

Given the restricted access to energy in developing countries, achieving large-scale improvements in energy efficiency will be critical to increasing the rate of economic growth through more efficient energy usage (Allcott and Greenstone 2012). Achieving such improvements is of particular importance because the futures of global energy usage and of carbon emissions depend almost entirely on the growth in energy demand in the developing world.

In this context, policies to increase energy-efficiency (ranging from technology mandates and building codes to efficiency credits and energy audits) in the developing world are seen as win-win. Not only might adoption spread quickly if they prove to be profitable, with highly positive implications for economic growth, but also because adoption of such policies on a mass-scale could be a critical means of mitigating climate change (Naucler and Enkvist 2009). However, little is currently

known about whether these policies and corresponding technologies will be adopted on a mass-scale and what effects they will have on increasing growth and abating climate change. Households and firms may not adopt these technologies even when these investments appear profitable on the basis of engineering analyses of costs and benefits (Joskow and Marron 1992, Jaffe and Stavins 1994). This may be because real-world returns to energy-efficiency investments may not match their predicted returns or because market failures may prevent firms from reliably learning about efficient technologies, or alternatively, a lack of capital, skilled labour, or other inputs may also serve to inhibit adoption.

Emissions associated with rising energy consumption in developing nations will impose significant costs on their citizens both in the form of local pollution and also climate change. These represent significant challenges to achieving sustainable economic growth in these countries. Heavy concentrations of pollutants may dent human capital formation, limit earnings capacities, and shorten life spans. Low environmental quality may dissuade capital investments in highly polluted cities. Global warming may depress productivity in agriculture and other areas of production. A higher incidence of extreme natural disasters may set back economic progress in affected areas and dissuade investment. Knowledge about the impact of these changes associated with increased energy consumption is limited. This in turn constrains our ability to design policies to minimize the external costs associated with energy consumption.

One clear external cost of energy consumption is pollution. The data reveals much greater concentrations of air and water pollution in developing countries than are currently recorded in developed countries and which, in some cases, are even higher than those ever recorded in today's developed countries. The available evidence suggests that they lead to large productivity losses. For example, Chen et al. (2013) find that a policy that provides free coal for indoor heating leads to dramatic increase in total suspended particulates pollution concentrations and a 5.5 year decline in life expectancy in the north of China. These elevated rates of mortality occur throughout the life cycle and the more than 500 million people living in the north of China are expected to lose more than 2.5 billion life years. These high levels of pollution are not limited to fast growing nations like China. Cities across the developing world, especially in those that are dysfunctional and poorly-planned, are ranked as the most polluted and, in most cases, the situation is worsening.

In addition to the threats to growth posed by conventional pollutants, the release of greenhouse gases from the combustion of fossil fuels and the resulting changes in the climate affect the productive potential of developing countries. Today's developing countries are expected to be the largest emitters of the greenhouse gases that are causing climate change in the coming decades due to their projected growth in energy consumption. Furthermore, climate damages are expected to be especially significant for many developing countries (e.g. parts of Bangladesh are at risk of disappearing due to the rise in sea levels). Specifically, the greatest damages are projected to occur in today's developing countries that are located in regions more susceptible to these shifts and that are also less able to make the necessary investments to adapt to these coming changes. In the years ahead, there will be increasing international pressure to reduce emissions and developed countries are likely to seek out opportunities for inexpensive emissions reductions in developing countries. Both international pressures and the shifts in these developing countries' environments will continue to shape the growth paths of these countries in the future.

Under the energy theme, we will conduct research on key questions relating to both minimizing the growth costs of both local pollution and climate change. The sustainability of energy policy as well as investigating and quantifying the adverse effects of the current inefficiencies in energy markets and negative externalities emanating from them will constitute some major focuses under the energy theme. We will aim to identify the most efficient energy technologies and practices and the real world rate of returns from alternative energy and energy efficiency investments. We will then examine which public sector energy-efficiency programmes have the highest rates of return, and what policies can be successful in encouraging the adoption of clean energy practices in developing countries, given their political and social structures. Finally, we will also examine how pollution and climate change affect productivity, the labour market and human capital accumulation and the design of policies to mitigate these impacts.

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