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Basara, Laura; Voeten, Jaap

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# Institutions, Resources and Innovation in Developing Countries: A Firm Level Approach

Policy brief DFID/Tilburg University research: *'Enabling Innovation and Productivity Growth in Low Income Countries' (EIP-LIC)*.

<http://www.tilburguniversity.edu/dfid-innovation-and-growth/>

Laura Basara (University of Nairobi) and Jaap Voeten (Tilburg University)

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## Introduction

The importance of innovation for stimulating firm-level productivity and economic growth has been underscored in economic theory for decades and finds support in empirical research. Recently, the promotion of innovation in manufacturing Small and Medium-sized Enterprises (SMEs) in Low Income Countries (LICs) has entered the agenda of policy-makers and international development agencies. Many agree that innovation is crucial in these countries, because innovation in all economic sectors is fundamental for growth, in order to catch up with middle and high income economies.

Innovation is foremost an entrepreneurial activity that takes place at the enterprise level. However, it is a complex process involving interactions with other players too. In innovation systems theory and innovation policy, these players are referred to as institutions. Institutions are defined as formal and informal rules and the regulatory context (including laws, policies, norms and cultural patterns) that structure human behaviour in economic productive activities and transactions.

In addition to using their resources to identify new technologies for their innovative activities, firms also use resources for absorbing new technologies and in the generation of new technologies. Hence, firm-level resources are directly related to innovation. A particularity in the context of LICs with regard to innovation is that firms typically operate below the technological frontier and are characterised by weak managerial and production capabilities with low rates of research and development (R&D), if any.

In past research, it has been argued that the value of firm resources can be more meaningfully understood in the context of the broader institutional environment. For this reason, institutional quality within a firm's region of operation is likely to influence the innovation activities of the firm. Whilst country-level institutional quality is of key importance, variations in institutional quality are likely to be observed across regions in a country due to differences in formal and informal institutions that are territory specific. Moreover, regional variation in institutional quality has been attributed to differences in the implementation and enforcement of formal legislative or regulatory frameworks. Additionally, the various manifestations of cultural, political and economic systems in regions within developing countries contribute to these differences.

In the framework of a DFID-funded research project entitled *'Enabling Innovation and Productivity Growth in Low Income Countries (EIP-LIC)'*, a team of researchers from the University of Nairobi and Radboud University Nijmegen analysed the interplay between a phenomenon known as Regional Institutional Quality (RIQ), firms'

resources and innovative activity. The original working paper<sup>1</sup> is entitled *'Institutions, Resources and Innovation in Developing Countries: A Firm Level Approach'* (2014) by Laura Barasa, Peter Kimuyu, Patrick Vermeulen, Joris Knobben and Bethuel Kinyanjui. This policy brief provides the research approach, main outcomes and policy implications of the paper.

## **Research approach and findings**

RIQ in the research framework particularly relates to the degree of regulatory quality, the rule of law and levels of corruption. The key argument is that well-functioning institutions are crucial for innovation. Therefore, firms are likely to be more successful in extracting value from their resources for innovation in regions with a high degree of institutional quality. The micro-level relationship among firm-level resources, RIQ and innovation in LICs has received little attention in the past. One major reason for this has been the absence of firm-level data relating to innovation in LICs. Furthermore, a majority of studies on the subject of innovation have been conducted in the context of developed countries, focusing on the determinants of innovation (findings of such studies have limited policy implications for LICs). As such, the research examines how firm-level resources interact with institutional quality to explain innovation. The extent to which institutions influence the degree to which firms are able to extract value from their resources for innovation remains unexplored, particularly in the context of developing countries.

The research hypothesises that a high degree of RIQ enhances the effect of firm-level resources on innovation. Previous studies find that firm-level resources that have been found to drive innovation include internal R&D, training, human capital, information search and communication facilities. This DFID research focuses on three firm-level resources including internal R&D, the education level of employees and quality certification. In particular, the research examines the moderating role institutions play with regards to the innovation process involving the generation of innovative output from firm-level resources.



Thus, a high degree of institutional quality is imperative for innovation because it mitigates uncertainty surrounding innovation activities.

The research is conducted in the context of LICs, which are characterised by a scarcity of resources such as inadequate human capital, low rates of R&D, a low degree of institutional quality demonstrated by widespread corruption, a low degree of regulatory quality and a weak rule of law. In fact, previous studies argue that differences in institutional quality explain the varied growth rates in developing countries. Various empirical studies place emphasis on the critical role institutions play in fostering entrepreneurial activity and innovation in developing countries. The data used for analysis concerned firm-level data from the World Bank Enterprise Survey and the Innovation Follow-up Survey, for the years 2010 to 2012, for Kenya, Tanzania and Uganda.

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<sup>1</sup> The paper is accessible at the project's website (<http://www.tilburguniversity.edu/dfid-innovation-and-growth>) under 'publications and reports'.

In relation to the hypothesised interaction between firm-level resources and RIQ, the research team found the following as a result of the analysis:

- An interaction effect between internal R&D and RIQ. Firms situated in an environment with a low degree of institutional quality have a lower likelihood of conducting and benefitting from R&D. In particular, a corrupt environment imposes a variety of transaction costs on firms and limits the incentive for investing in R&D and innovation. Furthermore, a lack of legislative transparency creates uncertainty, discouraging firms from investing in R&D. Nevertheless, a strong rule of law that reins in corruption and abuse of tax credits by firms is likely to enhance internal R&D.
- An interaction effect relating to employee education levels and RIQ. A firm with well-educated employees is likely to be more innovative in an environment with a high degree of RIQ. The employee education level reinforces innovation activities in a firm whose environment features a high degree of RIQ. Such an environment enables employees to use their knowledge and skills more productively and fosters innovation in a firm.
- An interaction effect of RIQ moderating the effect of quality certification. Obtaining quality certification is conditional on strict adherence to established standards and procedures. Yet, if auditors granting certification are corrupt and allow firms to implement quality standards only superficially, quality certification is unlikely to influence innovation. Notwithstanding, the effect of quality certification on innovation is reinforced by a high degree of RIQ because low levels of corruption, a high degree of regulatory quality and a strong rule of law have been associated with innovation.

### **Policy implications**

With regard to promoting innovation among manufacturing SMEs, it is vital that that more light is shed on the variation in institutional quality in regions within developing countries. It is particularly critical to address the extent to which RIQ influences innovation in developing countries, given that institutions are essential to shaping entrepreneurial activity encompassing innovation. The main outcome of this original research into RIQ in LICs is that the effect of firm-level resources on innovation is positively moderated by institutions. Thus RIQ plays a distinct role with respect to the extent to which firms successfully extract value from resources into innovative output in the context of developing countries. The value of firm-level resources significantly depends on the institutional environment within which the firm operates.

*'...We find evidence that the value of firm-level resources is conditioned on the regional institutional environment. Better institutional environments increase the value of firm-level resources for innovation while weak institutions diminish the value of firm-level resources for innovation. We argue that whilst firm-level resources are known to drive innovation, the moderation effect of institutions is imperative because institutions influence the extent to which firms extract and appropriate value from firm-level resources. Hence, the extent to which firms can successfully extract value from resources for innovation is contingent on regional institutional quality...'*

Taking into account the observed variation in RIQ in Kenya, Tanzania and Uganda, it is crucial for policy makers to focus on strengthening institutions by fighting corruption, enforcing the rule of law and fostering regulatory quality. This is not only important at the national level, but is also beneficial at the regional level. Thus, focusing on promoting good governance at the regional level may reduce the variation observed in innovation in the individual countries. A similar outcome is observed in the complementary qualitative research part of the DFID project (case studies and in-depth interviews). SME owners referred to the fact that the formal government institutions, represented by the government officials, make their business environment even more challenging. Business and tax regulations are unclear. While entrepreneurs in any country will usually complain about

government taxes, the situation is even more stressful and unpredictable in cases of bribery and corruption. While entrepreneurs need a formal institutional context that assures stability and predictability, the reality in many East African countries seems to be the reverse, bringing extra uncertainty and risk.

Several SME owners and managers suggested that creating a stable and predictable institutional context would be an efficient and effective way to promote innovation. All kinds of innovation policies and programmes could be developed, but the results of such policies will be undermined by the weak and unreliable wider formal institutional context.



At the innovation policy stakeholder meeting in Nairobi in 2013, organised by Tilburg University within the framework of the DFID, the government agencies acknowledged the importance of developing a network of innovation system institutions. These institutions include R&D and technology development centres, innovation and research funds, the financial and banking sector, universities and education institutes, patent registration bureaus and certification offices, to name only a few.

Overall, stronger institutions provide a sound business environment that stimulates entrepreneurial activity and innovation at the firm level. Well-functioning institutions serve to increase the value of firm-level resources with regards to innovation because firms are better placed for appropriating value from their resources into innovative output. This strengthens the argument of the importance of implementation and enforcement. If all countries were able to increase their overall RIQ to that of the highest region in their own country, the probable benefits in terms of increased innovation would be tremendous. Policy makers could make ‘best practices’ out of the regional implementation and enforcement of their national institutional policies and facilitate the spread of these best practices across the rest of their country.

Beyond the findings discussed, further research examining the effect of different categories of education levels including the effect of the interaction between higher education attainment and institutional quality on innovation would provide further insights. Additionally, internal R&D comprises different categories of expenditure, which may be critical to understanding how different types of R&D expenditure interact with institutional quality to stimulate innovation. Moreover, future availability of panel data would enable researchers to further examine the causal effects of the interaction of firm-level resources and institutional quality on innovation in developing countries.

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This policy brief is the product of a research project funded by the British Department for International Development (DFID) entitled ‘Enabling Innovation and Productivity Growth in Low Income Countries’ (EIP-LIC). The project is implemented by Tilburg University (The Netherlands) and explores SME-level innovation in Low Income Countries (LICs) and factors that contribute to or limit its diffusion. Data collection and research collaborations took place in 10 African and Asian countries (Bangladesh, Ethiopia, Ghana, India, Indonesia, Kenya, Tanzania, South Africa, Uganda and Vietnam). The policy implications of the research are presented in a series of policy briefs, targeted at a broad audience of policy makers within governments, business and development agencies with a view to quantifying research outcomes and promoting evidence-based policy making.