FIRM-LEVEL INNOVATION: IMPLICATIONS FOR POLICY AND PRACTICE

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Professor Gillian Marcelle
gillian.marcelle@wits.ac.za
Outline

• Role of the private sector in innovation at firm level.
  – innovation strategy
  – funding
  – interaction
  – frugal innovation, reverse innovation and constraint-based innovation

• Key Findings & Recommendations

• Wits University as a strategic partner
Innovation matters!

• Developing countries all face the challenge of competing effectively with more advanced economies in a globalised marketplace. Hence developing countries – perhaps even more than industrialized nations - need sound national innovation strategies to stimulate economic growth and development.

• Developing countries and more particularly those on the African continent often lack significant innovation capacity particularly in formulating and implementing innovation policies to guide and steer the development agenda.

• Developing country firms tackle innovation through learning and capability building.
Resource-based strategies

• Firms develop through a series of decision-making and implementation steps that search for resources and apply these in ways that add value and generate advantage over competitors.

• Among these resources are knowledge assets and a range of complementary assets that enable the firm to use knowledge effectively.

• Strategy therefore becomes a process of building complementary assets, referred to as capabilities and deploying them in directions that add value.

• Strategy making is inherently risky and initial conditions or starting points significantly influence the outcome of the process.

• Successful firms are those that have a deep stock of resources, built over time and the capabilities including decision making processes to effectively deploy these over time. Firms improve their abilities to search for, acquire and deploy resources over time and this process has been termed organisational learning. Resources and assets used by firms are varied and including financial, physical, natural, intellectual, human, and social capital.
IMPLICATIONS

• The relative importance of these various types of resources is linked to the nature of the production and consumption process in the industry in which the firm operates and also to factors such as the lifecycle of the technologies in use, and socio-economic conditions in which the firm is embedded.

THEREFORE

• Industry characteristics have a significant influence over the nature of the innovation process and its effectiveness
• Private sector firms manage innovation as a series of decision making processes in which the optimisation of financial resources and other assets take priority over other considerations
• There exist a variety of innovation positions and paths; firms select from among these based on the resource endowments of a firm and its strategy for learning (growing the stock of resources) and competitive dynamics.
• At an aggregate level of a region or a nation, there will be extensive variation in innovation performance at firm level, which then translates into different requirements and expectations from the ecosystem and from public policy agencies and actors.
Models of firm-level innovation

- Three distinct aspects: exploration, innovation (of which 90% is incremental) and diffusion.
- Influencing factors include nature of technological processes, government policy and the socio-economic environment.
- However, intra-firm processes, milestones and decision making priorities.
- The process is not a rational, deterministic one but is characterised by experimentation and contingencies.
Learning is central

- Firms often start off with low levels or even the absence of innovation capabilities. These firms typically are initially imitative and are frequently dislocated from markets and sources of technology.

- For developing country firms, the process of innovation management often involves the firms first becoming familiar with various ways of acquiring knowledge even before they are able to apply this knowledge for production and then to innovation.

- Developing country firms are also embedded in "increasingly pervasive international networks of potential sources of technology"

- Integration of internal learning and external learning becomes a key success factor

- Often not captured in theorising, innovation surveys and the mental models of innovation
Funding remains a challenge

- Late stage funding predominates
- Venture capital markets underdeveloped
- Risk averse traditional sources of finance
- Crowding-in trends
Figure 4.5. **Overriding goals and strategic tasks of innovation policy**

**OVERIDING GOALS**
Enhance economic growth potential; improve social well-being; cope with global challenges; provide impartial scientific expertise to policy makers, etc.

**STRATEGIC TASKS**

- Engage appropriately educated and trained **people** as workers, citizens, consumers and entrepreneurs
- Ensure proper valuation of **knowledge** and its circulation through networks and markets
- Provide supportive communication and other **infrastructures**
- Enhance the contribution of **public research**
- Unleash the innovation potential of **firms**
- Promote innovation in government, including as lead user

**Framework conditions for innovation**

- Policies to support investment in S&T and innovation
- Policies to enhance innovation competencies of firms
- Policies to strengthen linkages within innovation systems
- Dedicated S&T and innovation policy
Interaction and Linkages

- As economies become more sophisticated and specialised, the nature of interaction among a variety of agents becomes differentiated
- Segmentation and division of labour among innovation funders and innovation performers increases over time
- Developing countries are learning how to manage and optimise linkages
Social Capital and Innovation

• Structural social capital (business network assets, information network assets, research network assets, participation assets and relational assets)
• Cognitive social capital
• Some of these are more amenable to policy intervention, while others are features of social and cultural systems and deeply encoded.
Frugal Innovation

Source: Bhatti, Y. Page 4, Figure 1 Trends in globalization and innovation from emerging market firms
Frugal Innovation

• Cemex (Mexican cement company) redesigning credit programmes to enable more consistent purchases of cement and use of GPS technology to introduce “just in time” supply to small contractors
• Tata (affordable cars)
• Chinese tablet computer manufacturer has designed a device equivalent to the iPad expected to retail for about $80, or a fifth of the iPad's $499 base price at launch.
• Haier, Chinese appliance manufacturer that redesigned washing machine to better suit needs of customers which included using the equipment to wash vegetables as well as clothing
• A European carmaker is also midway through a new design -- for vehicles targeting several emerging markets. The company is borrowing design features and manufacturing ideas from its joint venture partner in India.
• Fiat Brazil's Fiat Mio, an urban-targeted compact car, is being designed in Brazil for global markets.
• GE investment in health care devices and systems
• Eye surgeries and other medical procedures at a fraction of cost in the Western world and Japan
Rethinking conventional wisdom

- Disruption of technology transfer models (Herstatt et al 2008).
- Conventional wisdom about global knowledge production and locational advantages is changing
- Factors influencing the location choices of MNC R&D investment include: market potential, agglomeration, public and private R&D intensity, proximity to leading universities or centres of research excellence, and strong IP policies
- OECD 2008 reports that countries with these features are increasingly located in Asia and this has affected the perception of Western MNCs regarding where good ideas can be found is also becoming transformed.
- Provides a basis for questioning some long held assumptions about the role of MNCs in delivering value from local knowledge. Shows that local knowledge and advanced capabilities to secure value exist without MNCs
Innovation requires pragmatism

• Calls into question that almost religious approach to reliance on market mechanisms in the purest sense. In many cases the technological mastery and associated confidence to experiment and move into design was undertaken during years of “protection” and with state support. Khan (2008) presents a well researched case of a variety of strategies used by firms to respond to changes in trade regimes and under various ownership forms.

• Emerging-market firms have developed unique and effective ways to respond to local conditions, many of which are challenging and representative of deficiencies in demand and supply. Theory-building as well as conceptual and empirical research on this phenomenon is largely being led by Western business schools, though with an over representative contribution of non-resident Indian scholars.

• The stories of entrepreneurial and innovation-driven strategies of local firms need to be told in order to build confidence and support and innovation culture
Findings & Recommendations

• Firms accumulate *production-based* and *innovation* capabilities over time in a managed process. It is this capability building process that is central to a firm’s innovation performance since it determines the types and levels of innovative activity that firms can undertake as well as the speed at which innovation improves.
• Countries don’t innovation, firms do, therefore policy on its own is insufficient and in order to realise success, innovation strategies require firms to have financial resources, management savvy and knowhow.
• For developing country firms incremental innovation accounts for the largest proportion of innovation activity, which is undertaken in collaboration across a variety of actors including suppliers of equipment and customers.
• Industry factors and technology lifecycles matter
• Linkages, interaction and access to funding still pose major problems for developing country firms
• The firm-centred approach to designing and implementing innovation policy is highly recommended but is not an easy option, because it will require state actors to admit and acknowledge that they are not in full control of the outcomes of the process. In this approach the state is required to adopt a posture of facilitation of an emergent process rather than controlling a rational and predetermined process and this takes confidence and organisation. It also requires the actors involved to work together with mutual trust and in partnership.
• Policies that do not include firm-level perspectives are suboptimal. At national and regional levels these become blunt instruments which do not acknowledge or respond to variation in innovation positions, paths and processes. These undifferentiated policies result in persistent challenge of funding innovation, even in areas that are earmarked for strategic focus such as the biotechnology industry.

• These weaknesses despite government intention call for a major departure from current mode of operation this writer suggests that constraint-based or frugal innovation presents an exciting opportunity.

• Large scale innovation programmes in areas such as renewable energies, waste management, housing and transportation.

• Making these reorientations in the scope and design of innovation programmes will not only foster improved partnerships between market and the state but will contribute to the political problem of demonstrating the relevance of science, technology and innovation spending. The state can play a major signalling role and stimulating investment including through procurement and leveraging of public funds.
• In South Africa, senior private sector figures are reportedly unfamiliar with the
details of the measures and organisational arrangements that exist for
innovation policy design and execution. These business leaders call for
greater demonstration of the value of innovation and an enhanced role by the
state in creating excitement and promotion of an innovation culture.

• What is also clear is that business leaders consider innovation to be a central
part of business strategy and an imperative, which happens regardless of the
innovation policy landscape. From a private-sector point of view, the
conceptual distinctions between technological and non-technological
innovation is a non-issue, precisely because innovation is regarded as a sin
qua non to deal effectively with competition, desire for international expansion
and the business cycle.

• Despite the lack of familiarity and regarding policy as not being important,
there appeared to be great willingness and disposition to reduce the current
disconnections between policy makers and business leaders.

• The general sense is that while the innovation policy is not particularly
significant as a determinant of innovation performance, it is also not a barrier.
South African Mini Case Study

• Well established national innovation system policy approach currently being reviewed by Minister of Science and Technology
• New planning architecture including entities such as the National Planning Commission
• New Growth Path
• Industrial Policy Action Plan 2
• Regional innovation strategies e.g. Gauteng Growth and Development Plan
Conceptual Issues

- Economic advance
- Public goods, social services & social benefit
- Science, technology, knowledge as fundamental inputs
Strategic Intent

*Gauteng Innovation Strategy aims to:* accelerate innovation in all its forms, in order to bolster and support the broader strategic objectives of sustainable social and economic development, and sustainable employment
Critical Knowledge Development

- Innovation and job creation
- Innovation landscape/ecosystem
- Community innovators and the psychological and anthropological issues involved in their emergence
- Technology acquisition strategies of firms

- University and industry interaction
- Measurable indicators of success
  - Benchmarks
  - Targets
  - Milestones
Important Researchable Questions

– What is the potential benefit of innovation and therefore why should we focus on it in Gauteng?

– What is the relationship between innovation and economic growth in Gauteng?

– What is the relationship between innovation and job creation in Gauteng?

– What are the mechanisms by which innovation activity leads to a change in society, particularly in Gauteng?

– How do various social actors including the provincial government stimulate these mechanisms to perform better?

– What are the appropriate measures of success?

– What is the baseline?
Wits as a strategic partner

- Wits through WBS has effectively established a platform and position of leadership in scholarship in innovation studies (policy and management) which is a specialization of growing interest and importance.
- The Wits approach proceeds from an original standpoint that develops critical engagement and focuses on all actors: business firms, public policy institutions and individual innovators.
- Reinforces the concept of considering firms to be active rather than passive agents and questions the common assumption that their innovation processes take place in response to signals originating from public sector institutions.
Modes of engagement

The outcomes are produced in many modes and provides a body of knowledge and practice that informs the innovative capacity of policy makers, business firms and communities through insights generated by

– Teaching
– Research
– Networking and engagement
Teaching

Masters Programme in Innovation Studies

- Specialized postgraduate Master of Management in Innovation Studies began in Feb 2011.
- Next intake in 2013
- An interdisciplinary programme that engages with how innovation impacts on economic growth and development and seeks to analyse how these impact on the achievement of broad social goals more generally.
- Aimed at contribution to the creation of a new generation of policy makers, scholars and business leaders
- The programme is directed by Professor Gillian Marcelle.
Unique Offering

- Combines policy and management with a developing country focus
- First of its kind in the world
- World-class faculty
- Academically rigorous and specialised
- Affordable and flexible pricing approx USD 12,000 payable over two years for part-time candidates
Network & Engagement

- Presentations drawn from institutions in 12 different countries. 26 academic papers presented, 7 keynote papers and presentations and over 15 roundtable presentations

- Keynote presenters included Professors Calestous Juma, Carlota Perez, Mamphela Ramphele, Judith Sutz, Anil Gupta, Derek Keats and Raphael Kaplinsky.

- Provided an exceptional platform for the exchange of knowledge and ideas among academics, policy makers and the business community.

- Over 125 registered participants over three days

- Public lecture by Professor Anil Gupta

- Special issue of the journal: International Journal of Technological Learning, Innovation and Development (IJTLID) and working papers published at www.wits.ac.za/managinginnovation

- Conference website and portal for participants and other interested parties to access the information of the symposium long after it had completed http://innovationsymposium.wits.ac.za

- Substantive media coverage of the event, a clear indicator of the importance of the topic and interrelated topics to Innovation and Development in the 21st Century
Research Agenda and Outputs

- International symposium on innovation and development
- Special issue of International Journal of Technological Learning, Innovation and Development (IJTLID)
- Journal articles
- Conference proceedings from IFD symposium
- Conference papers presented at ISPIM, New York and Hamburg Kellogg School of Management Global KIN forum; Aalto University, Helsinki
- Working papers published at www.wits.ac.za/managinginnovation
- Teaching case studies
- Innovation for sustainability
- Building innovation ecosystems
- Reducing policy fragmentation and misalignment in innovation policy
- Innovation strategies for biotech, electronic engineering and automotive firms
- R&D tax incentives
- Organisational learning and innovation
- Spatial dimensions of innovation
- Firm-level knowledge acquisition strategies
- Innovation policies for renewable energy
- Innovation in the bio-based economy
- Innovation and development surges
- Knowledge economy indicators and measurement
SMI Research Group

- Intellectually rigorous and thought provoking internal seminars

- The seminar series has played a pivotal role in investing in a new and growing innovation community both at Wits and elsewhere. There were six internal seminars during 2010 and most were co-hosted with a range of other players or institutions. They spanned across the year from April to December

- One of most well attended seminars was on the topic of the FIFA World Cup and was titled: ‘FIFA World Cup 2010: What Does It Mean for South Africa’s Innovation and Capacity Building?’. This was a jointly hosted event with the Joburg Centre for Software Engineering
Innovation@WBS

• Hosting pre-eminent scholars
  – Martin Bell
  – Carlota Perez
  – Anil Gupta

• Stimulating partnerships
  – UCT TuT University of Pretoria
  – Sussex  MIT Cambridge Brazilian Mexican and Indian universities and research centres

• Encouraging emerging researchers
  – Post doc fellowships
THANK YOU

For follow up and further elaboration
Professor  Gillian Marcelle