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EMERGING MARKETS AS A SOURCE OF INNOVATION: A SOUTH AFRICAN PESPECTIVE

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INTRODUCTION

- Today "**innovation**" is a priority all over the world.
- Innovation is crucial for long-term economic growth of a country, since it stimulates productivity and competition.
- Innovation is defined as the creation of a new, viable business offering (*i.e., product, process, organizational and marketing method*) that creates value to customers.

Innovation can be categorized into:

- Core innovations, which optimize existing products for existing customers.
- Adjacent or incremental innovations, which expand existing business into "new to the company" business.
- Transformational or new innovations for markets that don't yet exist.

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INTRODUCTION (cont…)

Four arears that are of interest innovation:

- a new product
- a new process
- a new way of selling something
- a new way of organizing the work place

- One of the advantages of innovation is that it allows for reduction in prices of goods and services (*as a result of competition*), thus ***increasing affordability*** levels and the ***buying power,*** which are the two main aspects of economic growth, especially in emerging markets such as South Africa.

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION?

- South Africa – affectionately known as the "Rainbow Nation" after the dawn of a democratic dispensation in 1994, is home to approximately 54 million people.
- SA is providing basic services such as water, housing, electricity, education and sanitation to its citizens.
- However, services are provided on an unequal and unsustainable basis, with the poor being marginalized.
- Attempts to ensure expansion of basic services present golden opportunity for innovation, which could be done by Government, Business, Research Institutions, Universities, etc.

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

- South Africa is very much aware of the importance of innovation as a vehicle to grow the economy.
- As a result, Government developed an enabling framework for science and technology, known as the national system of innovation (NSI).
- This began with the 1996 White Paper on Science and Technology, and followed by the National Research and Technology Foresight (2000) and the National Research and Development Strategy (2002), which proposed an investment target of 1 percent of gross expenditure on Research & Development. Lastly, the 2007 Ten-Year (2008-2018) Innovation Plan.

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

- There are several important scientific and technological developments which have originated in South Africa:
  - The first human-to-human heart transplant was performed by cardiac surgeon Christian Barnard in Cape Town.
  - Marx Theiler developed a vaccine against Yellow Fever.
  - Sydney Brenner won the 2002 prize for his pioneering work in molecular biology.
  - Mark Shuttleworth founded an early Internet security company.
- **Despite these advances**, South Africa's contribution in the innovation space is still low.
- As a result, the NSI is now being pushed through the Ten Year Plan.

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

- The Ten-Year Plan envisions a society that uses its knowledge systems and human capital to solve problems in the country and on the African continent, while exploiting economic opportunity in a sustainable way.
- The plan serves as tool to transform South Africa from a resourced-based economy towards a knowledge-based economy.
- All the plans related to the NSI are implemented by various stakeholders, mostly led by Research Councils, Technology Innovation Agency, etc., with most of the budget being provided by the Department of Science and Technology.

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

- Innovation areas include Natural Sciences, Technology and Engineering, Social Sciences and Humanities.
- Gross Expenditure on R&D (GERD) (2005/06 to 2014/15) increased from R14,149 to R29 345 billion.
- Government expenditure on R&D for (2005/06 to 2014/15) increased from 38,2% to 43,9%.
- Around 82.3% of government sector R&D expenditure (2014/15) was dedicated to Natural Sciences, Technology and Engineering; 17.7% was allocated to Social Sciences and Humanities sector.

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

- Expenditure on R&D by sector (2012/13 to 2014/15):
  - Government (R1,4 to R 1,8 billion).
  - Business (R10,6 to R13,3 billion).
  - Science Councils (R4 to R5 billion).
  - Higher Education (R 7,3 to R 8,4 billion).

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

Strengths

- The NSI is relatively performing better in certain areas when compared to some countries. For instance South Africa's technology payments as percentage of GDP in 2014 was 0.5%, a high value in comparison to the Brazil Russia India China (BRIC) group of countries (0.2% in average) but lower than that of South Korea (0.7%).
- Also, South Africa's scientific output as measured by the number of publications in internationally accredited journals increased at an annual average rate of 11% (i.e., 808 publications) over the 2005-2014 period.

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

Strengths (Cont.)

- A high proportion of business R&D expenditure in 2013/14 was seen in the services (47%) and manufacturing (32%) sectors.
- South Africa's share of patents in chemical engineering stands at around 6%, with a very high patent rate in special machines. In relation to the world's patents on chemical engineering, South Africa produces 0.13%.
- There is an improvement in the number of Doctoral degrees awarded in science and technology domains.
- The largest proportion of researchers is in higher education sector (65%) than in business sector (22%).

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

Weaknesses

- The level of R&D expenditure as percentage of GDP is still very low (0.73% in 2013) compared to China (2.01%), Russia (1.13%), Brazil (1.15% in 2012) and South Korea (4.15%).
- Business Expenditure on Research and Development (BERD) as percentage of general expenditure on R&D (GERD) declined from 58.6% in 2008/9 to 44.3% in 2012/13 and can be attributed to a low business confidence in the country.
- Government's funding of BERD (6%) in 2015/16, was very low as compared to the 2008/09 level of 27%.

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HOW WELL IS SOUTH AFRICA PERFORMING IN TERMS OF INNOVATION? (Cont.)

Weaknesses (Cont.)

- The number of researchers per thousand in South Africa is very low. In 2014, about 30% of all graduates were in Science, Engineering & Technology (SET) compared to much higher ratios in comparative countries (e.g., 47% of all graduates in South Korea are in SET).
- There is a low percentage of Grade 12s obtaining quality passes in the National Senior Certificate (NSC). In 2015, the number of students who obtained 50% for Mathematics was 51,500 and those who obtained 60% or more was only 31,000.

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WHAT IS THE ROLE OF FOREIGN AND DOMESTIC FIRM IN LOCAL INNOVATION?

Foreign and domestic firms play a crucial role in local innovation:

- In 2007, the biotechnology active firms declared that they were involved with 1542 products – 58% in agriculture.
- Thirty six percent of the spin-offs companies came from government agencies and 28% from universities.
- The total number of employees in the biotechnology active firms exceeded 72 800.
- The turnover of the core firms was R520 million (2006) and biotechnology exports were R 86 million.

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WHAT IS THE ROLE OF FOREIGN AND DOMESTIC FIRM IN LOCAL INNOVATION? (Cont.)

- The core companies raised R216 million during the 2003 to 2006 period, mainly from the BRICS (36%) and the Innovation Fund (19%).
- Their R&D expenditures increased from R48 million in 2004 to R76 million in 2006.
- An initiative such as the "**Broad-Band-for-All**" has enabled online connectivity to over 200 rural schools, reaching almost 100 000 pupils, government centres, and community radio stations.
- Free Wifi "Hot Spots" have been established in the City of Tshwane and residents can use up to 500MB/day.

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PROMISING INDUSTRY/ TECHNOLOGY AREAS IN SOUTH AFRICAN INNOVATION

- The promising industries are in line with the Vision of the Ten Year Plan for innovation towards a knowledge-based economy in South Africa (2008-2018):
  - Biotechnology (food, medicine, etc.).
  - ICT (internet of things, broadband connectivity, Wifi).
  - Space Science (astronomy).
  - Energy Security (alternative energy).
  - Climate Science (climate change response mechanisms).

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HOW INNOVATIVE ARE LOCAL FIRMS?

- Local firms are inspired by the challenges facing our country and hence their innovations are aimed at providing solutions to those challenges.
  - For instance, local firms developed Web-based and Mobile-based Applications to combat crime;
  - Improve security by developing industrial and home-based automation systems; and
  - Improve access to internet and electricity in rural areas.

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WHAT TYPES OF INNOVATION ARE POPULAR AMONG THEM?

- The popular innovations are the ones that have a socio-economic impact on South Africa.
  - Web-based and Mobile-based Applications for digital communication;
  - Biotechnology (Medicine, especially drug delivery); and
  - Provision of clean water (i.e., point of use water treatment systems).

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WHAT IS HINDERING INNOVATION IN EMERGING MARKETS?

- **Startup capital:** Access to finance is a challenge to most companies.
- **Access to technology/information:** State of the art technologies are not always available in emerging markets. As a results, acquiring such technologies is expensive and unaffordable.
- **Cost of regulatory approval:** Cost of legislative compliance is unaffordable to majority of Small Medium Enterprises, which in most cases suffer from cash flow challenges.
- **Lack of protection for intellectual property (IP):** High cost of IP discourages innovators who cannot afford it.

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THANK YOU