

Dynamic Capabilities for Building Innovative Competitive Advantage in South Africa

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The BRG Institute

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Agenda

1. Dynamic Capabilities as a core concept for innovation, growth, and sustained competitive advantage
2. Entrepreneurial management capabilities – the often forgotten yet critical link for innovation
3. Value creation and value capture (Profiting from Innovation Framework)
4. Universities as catalysts in the national system of innovation
5. The strategic orchestration role of Government
6. Policy thrusts for South Africa
7. Expert panel discussion
 - i. We are also here to learn!
 - ii. We want outside views and constructive pushback in order to better inform our thinking within the local context
 - iii. The ultimate goal is the delivery of a report for CSIR and TIA

The aim of the game: Innovation and economic development

- Joseph Schumpeter observed nearly a century ago that the very essence of innovation is typically “new combinations.”¹
- These new combinations can involve not just technology but also business models, management systems, and more.
- To be valuable, an innovation must first create value for users, then the supplier of the innovation must also have a way to capture some of the value.
- Dynamic capabilities guide this process by recognizing emerging trends, devising and implementing a viable business model, and designing the organization accordingly.

“There is no manual on how to transform a traditional economy into an innovation economy”

Financial Times, Special Report, November, 2016.

Dynamic Capabilities for sustained competitive advantage of firms, and nations

“The ability of an organization and its management to integrate, build, and reconfigure internal and external competences to address rapidly changing environments” (Teece, Pisano, and Shuen, 1997: 516)

These higher-order capabilities fall into three categories:

Sensing

Identification of opportunities & threats at home and abroad

Seizing

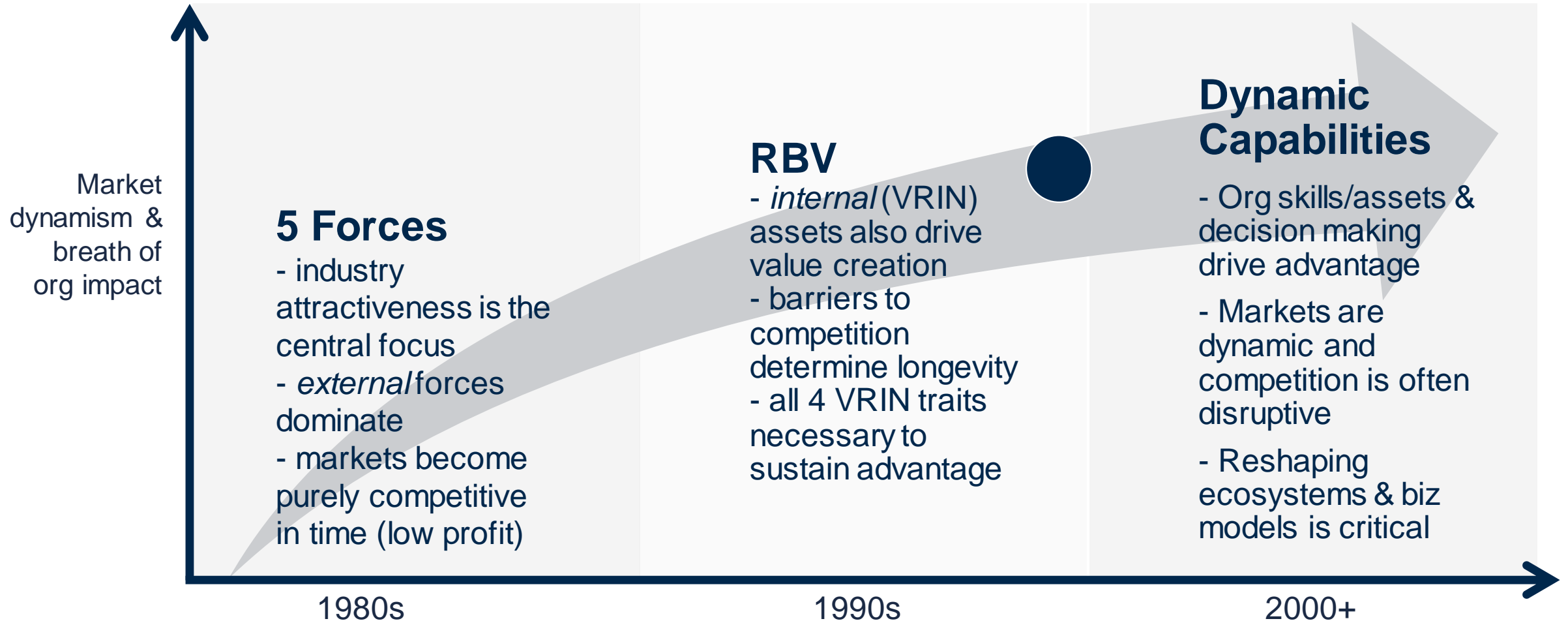
Mobilization of resources to deliver value and shape markets

Transforming

Continuous renewal and periodic major strategic shifts

The evolution of strategic management & competitive advantage

The Dynamic Capability model is only the third substantive framework for maintaining competitive advantage to emerge in the last 40 years



Dynamic Capabilities as a Theory of Growth and Economic Development

Traditional economic development theory:

Investment leads to resource accumulation that combines (somehow) with labor to generate growth

- Akin to the resource-based view of the firm – but firms are seldom mentioned
- Nelson and Pack (1999, p. 434)¹: “if ... one marshals [inputs] but does not innovate and learn, development does not follow”

Dynamic Capabilities theory:

Firm-level entrepreneurship, innovation, and learning guide the accumulation and exploitation of resources.

- A large and growing entrepreneurial-managerial class that can create and populate dynamically capable firms is needed for growth.
 - Provide support for high-quality management training
 - Support opportunities for temporary employment in advanced economies

Nobel Laureate Amartya Sen highlighted the importance of capabilities¹

- He was concerned with capabilities at the individual level
- Capabilities are seen as the fulcrum for leveraging tangible resources into human achievement
- He recognized that individuals can differ greatly in their abilities to convert a given set of resources into outputs
- His attention was on what can be called ordinary capabilities, in contrast to the dynamic capabilities that are the main focus here
- Capabilities must be understood at both the individual and organizational levels; organizations are complex systems that are more than the sum of the individuals involved

¹ *Commodities and Capabilities* (1985)

Firm-level capabilities are finally coming to be recognized as foundational to the wealth of nations

“The proximate cause [of differences in the wealth of nations] lies, for the most part, in the capabilities of firms”

(John Sutton, *Competing in Capabilities* (2012), p.8)

“In market economies, the competitive strengths of industrial firms rest on learned organizational capabilities ... the competitive strength of national industries depends on the abilities of the core firms ... to maintain and enhance their integrated learning bases.”

(Alfred Chandler, Jr., *Inventing the Electronic Century* (2001), Introduction)

For a nation, firms and their managers are the links between S&T and GDP

- Innovation is the beginning, not the end.
- Innovations must be combined with other technologies and complements to create value.
- Only when value creation is combined with value capture can a firm sustain itself and continue to innovate.
- Business model design and innovation is as important as technological innovation
- **The Dynamic Capabilities framework provides a scalable approach to value creation, value capture, and the continuous alignment of (technological and organizational) innovation and markets.**

Dynamic Capabilities are needed both in business and government

For an open economy:

- **Sensing** involves finding new technology & market opportunities domestically, regionally, and globally; integrating knowledge with firms or trade associations
- **Seizing** involves deploying capabilities and resources in pursuit of the most promising opportunities; supporting novel business models with regulation; revising trade agreements where needed; supporting firms willing to learn and upgrade
- **Transforming** involves decreasing bureaucratic friction in the economy; simplifying decision-making structures; supporting young industries while maintaining the trajectories of older ones

Strong dynamic capabilities are critical for ensuring that private-sector and government-supported innovation programs are aligned with future market requirements.

Sensing, Seizing, and Transforming require multiple types of managerial skills

Three types of management:

- **Entrepreneurs** SENSE opportunities and innovate new products and services
- **Managers** SEIZE new markets with innovative business models
- **Leaders** TRANSFORM companies to be more daring and open to change

Strategic management capabilities in firms are critical and often forgotten in industrial and innovation policy and funding

Entrepreneurial Management plays a key role in developing strong firm level Dynamic Capabilities

Entrepreneurial managers are needed in established firms and institutions, not just in startups.

They:

- excel at interpretation and synthesis
- foster a culture of learning to build capabilities
- orchestrate (select, integrate, modify) resources
- devise business models
- develop analyses that support strategy formulation
- adjust strategy implementation
- keep the organization nimble

Ordinary Capabilities – the “boring stuff” – are important to get right – especially in developing countries

- Ordinary capabilities are about “best practices” and technical efficiency
- Routines & standard operating procedures are key to ordinary capabilities
- Building/imitating strong ordinary capabilities is enabled by
 - › Information in the public domain
 - › Business school training
 - › Management consultants and technical experts
- But it does no good to be excellent at doing the “wrong” things

Strengthening the ordinary capabilities of firms can provide a short- to medium-term boost, but this should not become an end in itself.

Ordinary vs. Dynamic Capabilities

Ordinary Capabilities

Dynamic Capabilities

Purpose

- Technical efficiency in basic business functions

- Strategic “fit” over the long run (evolutionary fitness)

Aspects

- Operational, administrative, and governance

- Sensing, seizing, and transforming

Imitability

- Relatively easy; imitable

- Difficult ; hard for rivals to imitate



Doing things right



Doing the “right” things

Industry example: Ordinary v. Dynamic Capabilities in Autos

In globally competitive industries, strong ordinary capabilities are “table stakes”:

The operations portion of the automobile business has been thoroughly optimized over many decades, doesn't vary much from one automobile company to another, and can be managed with a focus on repetitive process. It requires little in the way of creativity, vision or imagination. Almost all car companies do this very well, and there is little or no competitive advantage to be gained by “trying even harder” in procurement, manufacturing or wholesale.

Competitive advantage requires dynamic capabilities:

Where the real work of making a car company successful suddenly turns complex, and where the winners are separated from the losers, is in the long-cycle product development process, where short-term day-to-day metrics and the tabulation of results are meaningless.

Source: Bob Lutz, former vice chairman at General Motors

Wall Street Journal, June 11, 2011

Industry example: Ordinary v. Dynamic Capabilities in the U.S. Army

- “We had a culture in our forces, of excellence. It was how good can I be at my task? How good can I be at flying an airplane, dropping bombs, locating an enemy target? But that’s not as important as how well those pieces mesh together.”
- “The real art is [in] cooperating with civilian agencies, it’s cooperating with conventional forces, it’s tying the pieces together. That’s the art of war, **and that’s the hard part.**”

– *Quotes from General Stanley McChrystal, Foreign Affairs (March / April 2013)*

Strong Sensing Capabilities Requires an Open Innovation approach

- “*The use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation*” (Chesbrough et al, ‘Open Innovation: Researching a New Paradigm’, 2006)
- Recognizes that not all new ideas and products can be developed internally
- Augments internal efforts by combining them with critical ideas and resources from external partners
- Requires search, cultivation of partners, and commitment to bilateral sharing (but not complete openness)

Seizing Involves Value Capture: Profiting From Innovation Framework (Teece, 1986, 2006, 2018)¹

An analytical framework for understanding why innovators often lose to latecomers

Key Factors:

- Appropriability Regime (I.P. protections and the inherent complexity of the technology)
- Complementary Assets
- Timing
- Standards
- Learning Curve Advantages
- Certain complements that are scarce and hard or costly to replicate can become bottlenecks, draining value away from the innovator if they are owned by a third party.

¹ 1986, "Profiting from technological innovation." Research Policy 15(6);
2006, "Reflections on 'profiting from innovation'." Research Policy 35(8);
2018, "Profiting from innovation in the digital economy." Research Policy 47(8).

The Profiting From Innovation (PFI) Model Identifies Factors That Shape Value Capture Strategies

Complementary Assets

Specialized or co-specialized?

Generic?

Standards and timing

Pre- or post-dominant design?

Who "controls" the standard?

Business model choices

Licensing?

Vertical Integration?

Joint venture?

Hybrid?

Appropriability regime

Ownership of intellectual property?

Ownership of relevant complementary assets?

Imitability of the knowledge owned?

PFI Helps Frame Key Strategic Questions

- Has a dominant design taken over the market yet?
- What is the bottleneck asset in the value chain?
- Bottlenecks can be proprietary standards, intellectual property, and/or complementary assets
- What business model choices provide the innovator the best chance to control (or bypass) the bottleneck?

Owning/controlling the bottleneck is the road to riches, **whether or not you are the innovator**

Transforming: Getting Organizational Culture Right

- Culture: core values about how to treat employees, customers, suppliers, and others
- Goal: foster innovation, internal collaboration across boundaries, and flexibility
- Must be strategically aligned (not every company can be Google)
- Leaders must demonstrate a willingness to trust: Give employees what they need to succeed, then get out of their way
- Bad culture hurts performance, recruitment, and reputation.

Seen From The Other Side...

Non-innovators have two basic strategies:

- **Imitate**: success requires speed, capital, protection against infringement claims
- **Complement**: use open standards from the innovator to search for ways to add value and or corner a bottleneck asset

Imitation demands strong ordinary capabilities

Complementing requires strong dynamic capabilities

Competition today involves ecosystems, not industries

- Traditional level of analysis: “industry” or “market”
 - › Competition occurred within an industry
- Business ecosystems consist of suppliers and complementors working together to co-create and sustain new products and markets
 - › All building on a “platform” (standards and interfaces)
 - › Members can be from multiple “industries”
- Competition occurs between ecosystems, not just firms
 - › Ex: Android vs iOS

Ecosystems offer ample niches where less innovative firms can gain a foothold and begin the learning and upgrading process.

Strong Dynamic Capabilities are Needed Everywhere

- All organizations (Large and Small Firms, Universities, Government Agencies) have some level of Dynamic Capabilities...
- But in many organizations Dynamic Capabilities are weak
 - › Too inward-looking
 - › Poor business models
 - › Blind to opportunities and threats
 - › Slow to adjust
- Strong Dynamic Capabilities take time to develop and require continuous refinement, which calls for the investment of resources.
- An organization must determine the nature of its need for foresight and flexibility before launching the investment/development effort.

Universities Need Dynamic Capabilities

- The relative importance of knowledge domains is not fixed
- The needs of businesses that will hire graduates shift regularly
- Key role is to train students with skills that will be in demand
- To do this well requires astute management of resources and an ability to attract more
- Orchestration with local and national business ecosystems is also critical

Capabilities in the University

Examples of Ordinary Capabilities:

- Rewarding high-quality research
- Maintaining high teaching standards
- Benchmarking peer organizations

Examples of Dynamic Capabilities:

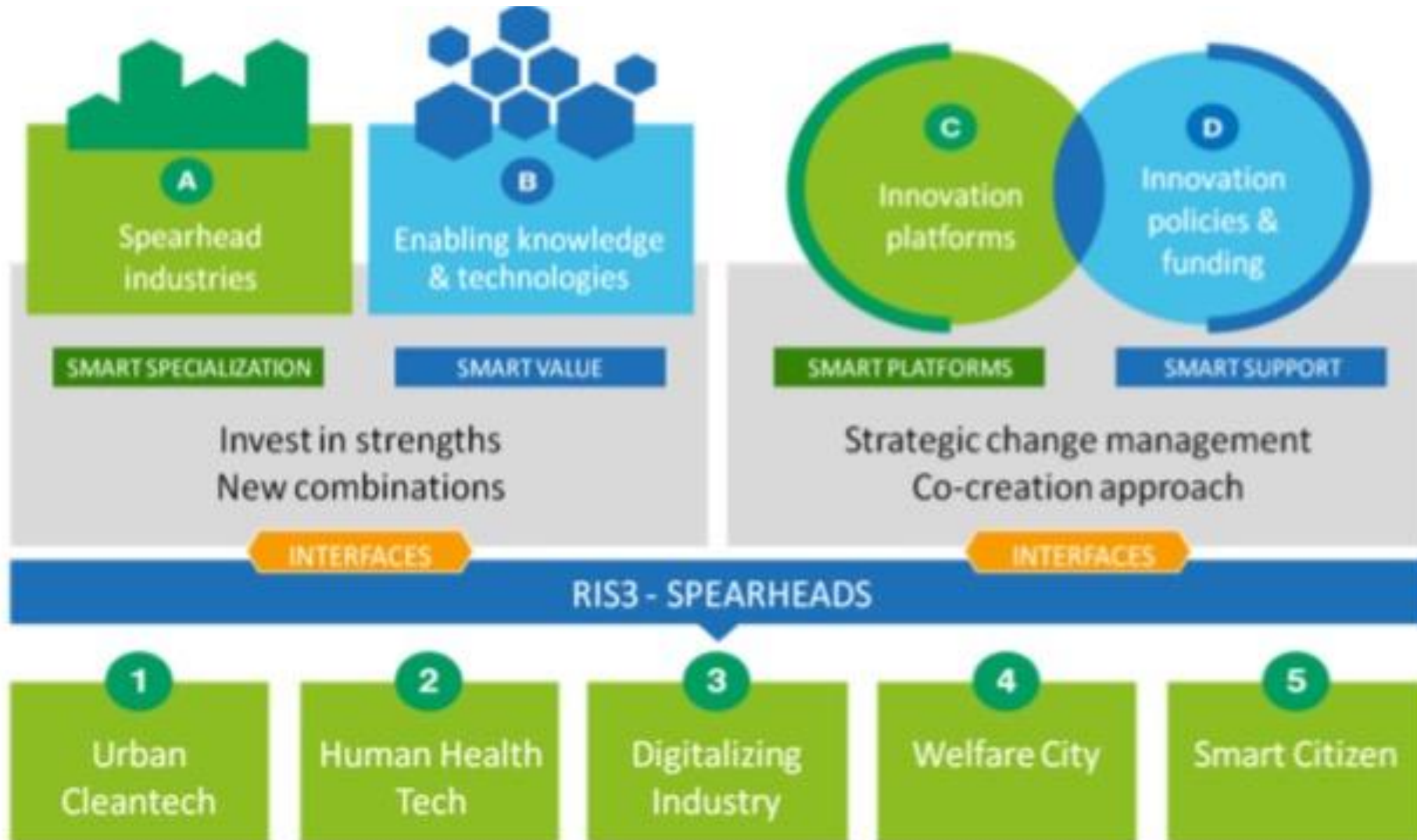
- SENSE: monitor impending changes at regulators, businesses, and in local community; look for potential new fund sources and partnership opportunities; energize technology transfer activities
- SEIZE: implement new teaching technologies; explore alternate contractual arrangements with faculty; contract for services such as cafeterias when competitive suppliers exist
- TRANSFORM: instill a culture that embraces change; allocate resources to where growth is expected/needed; monetize underused real estate or other assets

University-based innovation ecosystem

- Converts technology and other inputs into enterprise development
- University can provide the pillars for regional specialization
- Attracts existing firms
- Develops new niches to broaden its base

University helps identify promising technology areas, offers specialized programs, and provides “innovation platform” to facilitate ecosystem-wide collaboration

Example: The Helsinki Region (Markkula and Kune, 2015)



Government Can Assess and Remedy Gaps in the Innovation Ecosystem

Missing Resources?

- Capable entrepreneurs?
- Good governance regs?
- Adequate IP rights? IP Access?
- Local Support services?
- Freedom to fail and start again?

Collaboration failures?

- University-industry?
- Government-industry?
- Company to Company?
- University to other national systems?

Dynamic Capabilities in Government includes Orchestrating across Multiple Policy Thrusts

1. Energize Entrepreneurship
2. New MNE Engagement
3. Narrow Sub-Sector Targeting
4. Mission-Oriented Innovation Policy
5. Increase Global S&T Collaboration

The policy thrusts must go hand in hand with a deliberate push to develop dynamic capabilities in not only firms but also institutions.

Guiding Principles Behind Future Policy Thrusts

1. Industrial emergence is an evolutionary process; the short- to medium-term focus should be on evolving and augmenting existing firm-level, industrial and national capabilities
2. Learning and upgrading of firm capabilities and individual skills are the fuel to power innovation for South Africa and capture more value from the value chain
3. Strengthening value capture from domestic and foreign R&D / S&T is a longer-term means to accelerate development
4. A multi-stakeholder approach can help ensure that development does not deepen economic inequality

Policy Thrust 1: Energize Entrepreneurship

- Start-up culture is well-established, but is too concentrated in particular sectors, like financial technology
- Goal should be to spread the culture more widely
- Sense: identify early-stage entrepreneurs and reach out to offer services and other support
- Seize: lower bureaucratic barriers to starting and running a business; teach entrepreneurship skills
- Transform: create outreach program for early-stage entrepreneurs; publicly acknowledge the contributions of successful founders to create better awareness; incentivize successful entrepreneurs to support new start-ups

1a: Entrepreneurship Risks and Rewards

- Very few start-ups will scale beyond the micro-enterprise stage; but those few can be large-scale employers
- Accelerators, incubators, etc., have a poor record of helping firms achieve scale
- More valuable is mentorship from the founder of a successful start-up or from a VC investor (“Guided Entrepreneurship”)
- Contrary to popular myth, older founders with up to 20 years work experience are more likely to be successful
- “Social entrepreneurship” can widen the range of people attracted to start-ups and help meet social goals

1b: Example of an innovative approach to helping entrepreneurs: Endeavor Global Inc.

Endeavor is a global non-profit active in S. Africa since 2004

Local offices in S.Africa and elsewhere select potential high-impact entrepreneurs

For those selected, Endeavor offers a range of critical support services to help them grow:



Could be replicated domestically by a public, or public-private, initiative

Policy Thrust 2: New Multi-National Engagement

- South Africa has done a great job of attracting MNE investment, but it's over-concentrated in a few sectors
- Strategic investments in renewable energy and other emerging industries have the potential to help employ and train SA's large pool of unemployed, low-skill labor
- Sense: look for high-employment assembly opportunities among MNEs looking to open new regional factories
- Seize: arrange for higher-skilled workers from existing plants to help fill key roles in new factories
- Transform: Reduce bureaucratic friction to starting a new factory

Policy Thrust 3: Sub-Sector Targeting

- The domestic and global economies are full of existing and emerging niche opportunities, from digital services to traditional manufacturing
- Policymakers can play a role in supporting new and existing businesses willing to address these opportunities.
- Upstream opportunities exist in Mining, Agriculture, Energy, and Manufacturing
- S&T-based model: develop new products within GRI then spin off the entire lab (ex: Taiwan semiconductors)
- Sense: Identify and calibrate potential opportunities; assess whether private firms already exist that could exploit them directly
- Seize: Assemble the best possible personnel to pursue the idea; ensure adequate financial and managerial resources
- Transform: Establish potential spin-off in GRI (if not being done in private sector)

Target 3a: Global Value Chain Niches

- South Africa has relatively little involvement in global value chains (GVCs) outside the auto industry
- Its geographic disadvantage will be less important for high value-to-weight niche inputs
- Sense: Look across well-established (GVCs) for suitable niche opportunities
- Seize: Develop suitable local capabilities while cultivating GVC access
- Transform: Make necessary regulatory changes to facilitate participation

Policy Thrust 4: Mission-Oriented Innovation Policy (Mazzucato)

- Addresses major societal challenges that requires innovative inputs from multiple industries
- Requires policymakers to be future-oriented
- Not “picking winners” but rather setting a direction and correcting coordination failures
- Provision of patient capital
- Requires public organizations able to take risks, learning from and not punishing every failure
- Rewards should be shared between public and private actors
- Examples: sustainable agriculture; improving the health and education systems; clean tech and greening the economy

Policy Thrust 5: Increase Global S&T Collaboration

- South Africa is relatively unconnected to global S&T networks in terms of, for example, internationally co-authored papers
- Provide support for greater foreign engagement by GRIs and firm-level S&T units in order to build domestic capacity for the long-term
- Sense: Help researchers find international collaboration opportunities
- Seize: Provide research grants specifically for international collaboration; provide support for foreign researchers to study in S.Africa; search for opportunities with local firms to capture value from the knowledge generated.
- Transform: Monitor progress in this area over time

Future policy questions for South Africa: Expert panel

1. Are policymakers in productive dialogue with private enterprises in SA and abroad? Are they able to evaluate market information provided by firms?
2. Are the multiple departments, universities, agencies, and boards tasked with sci & tech development competing or collaborating with each other?
3. Are policymakers assessing the dynamic managerial capabilities in firms seeking support? Are there programmes to help build these capabilities?
4. What are the critical “mission-oriented” policies to orchestrate across South African industrial and innovation policy domains right now?
5. Is there a clear strategy for improved domestic and foreign value capture (PFI) for South Africa?