A TIAC Occasional Paper

STIMULATING INNOVATION: COMPARATIVE AND COMPETITIVE ADVANTAGES, AND THE ROLE OF COMPETENCIES

Context:

TIAC is providing the State Government with advice about optimising innovation aimed at strategically strengthening and diversifying the economy, and enhancing the cost effectiveness of Government services. Its work should therefore be framed at the sectoral level, rather than that at individual enterprise level, and this discussion of the role of advantages, and competencies follows that principle.

Any consideration of advantages must differentiate between *Comparative Advantage* and *Competitive Advantage*, as discussed below. Similarly, consideration of competitive advantage, at the sectoral scale, needs to acknowledge the separate, but interlinked, contributions of *Functional Competencies* and *Generic Competencies.* The purpose of this note is to highlight the crucial, but under-recognised, role of generic competencies and to emphasise their potential to enhance innovation and the State's competitive advantages.

Definitions of Advantages and Competencies:

- ***Comparative Advantage:***

This concept by David Ricardo guided international free trade from the early nineteenth century and is based on the principle that comparative advantage is a given, almost independent of policy. The notion can be broadened in the case of WA to include our "givens", such as: geography (location, climate, size and coastline), geology (natural resource endowment, and utility of the landscape), biodiversity, culture, and well-being. These are powerful comparative advantages for WA, but are largely outside the scope of a TIAC study.

- ***Competitive Advantage:***

The concept of competitive advantage was developed in the 1980's and is based on the belief that trading nations can shape what they are good at whilst still preserving the principles of international free trade. For example, WA's competitive advantage in minerals and energy is not solely due to its comparative advantages, because supportive policies and actions were required in areas such as infrastructure, education, research, marketing and trade arrangements. Similar observations can be made about agriculture and the manner in which WA has optimised its comparative advantage of large areas suited to dryland agriculture. In contrast, comparative advantage has had a much lesser role in developing our competitive advantage in astronomy, shipbuilding and health, areas where deliberate policies and actions have led to competitive advantage.

Our competitive advantages are normally viewed through functional prisms. For example, any discussion of competitive advantages in the State's mining industry recognises our internationally acknowledged expertise in exploration and its various components (geochemistry, geophysics, drilling, analysis etc.), mining (open cut and underground and their components), metallurgy etc. These are the all-important *Functional Competencies;* equivalent competencies can be identified in our other areas of competitive advantage.
These functional competencies are instantly recognisable, familiar to most, tend to frame our understanding of individual sectors within the economy, are mostly discipline-based, and strongly influence many career choices. They mostly reside within a specific sector, and whilst these competencies do not readily transfer to other sectors, they can be adapted. Functional competencies are optimised by drivers such as need, competition and critical mass, and are a source of substantial innovation in WA. Strengthening functional competencies through education, training and capital investment will stimulate innovation. Here is a possible definition:

- ***Functional Competency:***
  The successful application of a combination of qualifications, skills and experience, by an individual, or group, to specialised tasks, often discipline-based, within an operation.

The other component of competitive advantage is *Generic Competencies.* Whilst they can be as important as the functional competencies within our economic sectors, they are usually obscured by them. Generic competencies are adaptable, transferable and often common to several sectors of our economy. They amplify the impact of the functional competencies and the breadth and intensity of their contributions is expected to rapidly increase with increasing technology and digital convergence. Generic competencies usually consist of an integrated package of enabling capacities, skills and technologies that, when applied in specific contexts, contribute to the acknowledged competitive advantage of some, or all, of our more traditional economic sectors, such as: mining, energy and agriculture, astronomy, health and shipbuilding.

Examples include: big data and data analytics; imaging; sensor technologies, remote operations; regional and remote communications and operations; and dryland agribusiness. A key specific example is the adaptable package of capacities, skills and technologies that enable the remote control of iron ore operations in the Pilbara. Through increased productivity this package has substantially enhanced the competitive advantage of this sector and it has the potential to similarly enhance the competitive advantage of other sectors, such as agriculture. Interestingly, whilst functional competencies played the key role in optimising the benefits of the State's comparative advantage of exceptional iron ore deposits for almost 50 years, it is now generic competencies that are maintaining the sector's competitive advantage.

Our generic competencies are at the forefront of innovation in WA and conscious strengthening of these competencies will enhance our capacity to innovate and enhance our competitive advantages. Whilst both functional competencies and generic competencies provide the opportunity to leverage off existing businesses to create new business and disrupt existing ones, it is the latter that are more adaptable and transferable. However, measures to stimulate innovation and increase competitive advantage through policies aimed at enhancing our generic competencies first requires a thorough assessment of just what these competencies are, what are their impacts, and what is their potential. A preliminary definition follows:

- ***Generic Competency:***
  In the context of the WA economy: *"A Generic Competency is an adaptable and transferable package of enabling capacities, skills and technologies that extend across, contribute to, and enhance the competitive advantage of some, or all, of the key economic sectors in WA."*

Proposed Action:

This TIAC review of the role of advantages and competencies in stimulating innovation in WA has identified the importance and potential of generic competencies in enhancing our competitive advantages in the great competition for global advantage. Whilst recognition should lead to specific recommendations for policies that will support and strengthen our generic competencies, the reality is that we do not adequately understand their breadth, depth and potential within our economy. Assessment and mapping of these features of generic competencies within our economic sectors is a necessary precondition for policy development.

In its paper *"Stimulating Innovation in Western Australia: Laying the Foundations"* TIAC is proposing a significant study to map the clusters and concentrations of innovation in WA as a precondition to development of policies designed to stimulate and strategically strengthen innovation in WA. This subsequent review of advantages and competencies indicates that the proposed mapping exercise should also include differentiation between the contributions of functional and generic competencies within the clusters of innovation, and also identification of the key generic competencies within the State's economy.

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