

Senate Economic References Committee

Parliament House

Canberra ACT 2600

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Dear Senators

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### Inquiry into Australia's Innovation System

As a matter of definition, let me start by characterising innovation quite simply as the successful implementation of new ideas, or 'ideas successfully applied'. In the present-day knowledge economy, there is a strong link between the level of national investment in research and development (R&D) and the discoveries and inventions that are adopted and applied to create new industrial infrastructure as well as what seems like an ever-expanding range of new or radically improved end user products and services.

While emphasising the need for greater industry relevance, the submissions ask us not to underestimate the importance of investment in the basic research that creates and extends enabling technologies in areas such as nanotechnology, micro/nanoelectronics, semiconductors, advanced materials, photonics, analytics, artificial intelligence and biotechnology.

Most of these technologies include the development and application of digital technology and the capacity to develop software. Digital literacy is becoming a key requirement for economic and social progress in the digital age. It is reflected not only in the industries built around traditional production (manufacturing, mining, energy, transport), which are going through a process of digital transformation, but also in the services sector (construction, banking, finance, health, government) and the creative and cultural industries.

In a business context, innovation is closely associated with an emerging vibrant culture of entrepreneurship in Australia and globally – the ability to visualise and create economic value through the application of ideas and insights about market behaviours and customer wants. Submissions note that many of these insights are put into effect with the commercial application of new knowledge and technologies generated by research.

A key theme of the inquiry is that such innovation thrives in an innovation 'system' – essentially the relationships and interactions between knowledge creating organisations (research and education institutions), knowledge adopters (industry, and the businesses that constitute it), and government (in its policy, funding, enabling, and regulatory roles). Financial organisations, including venture capital

investors and a range of innovation ‘intermediaries’ play an important enabling and integrating role.

Innovation systems not only have national but also local and regional dimensions. Geographic clustering and the formation of innovation ecosystems around universities and research organisations are becoming more prevalent in the development of technology-oriented industries, in sustaining international competitiveness and in creating long-term growth and jobs. Many submissions also recognise the value of social innovations that enhance community well-being and the quality of the environment and human interaction both in cities and regions and in rural and remote areas.

Submissions have pointed to the importance of continued investment in world class university education and the development of an integrated tertiary education system that covers both higher education and vocational education and training (VET). Lifting innovation performance must encompass the role of the VET sector and new funding models must address and simplify cross-sectoral collaboration. Current and future employers require university graduates with ‘boundary-crossing’ skills and an appreciation of practice, and technicians with an appreciation of theory.

The predominant logic behind contemporary innovation policy tends to be on the *supply side* with the primary focus being on investment in science and research. However, it is also important to address *demand side* issues as many Australian businesses are not sufficiently committed to R&D and lack the motivation or incentive to invest in new products, processes or ways of doing business, including participation in global supply chains and building enterprise ‘absorptive capacity’. This requires us to find ways of strengthening Australia’s innovation and entrepreneurial culture.

Many submissions call for a greater commitment to industry led research and development. Currently business investment in R&D is heavily oriented towards mining and energy, manufacturing, information and communication services, and commercial services and tourism. By contrast, university research is heavily concentrated in health, the environment, and generally expanding knowledge. The commitment to health research reflects in large part the targeted funding of the NH&MRC, the strength of medical research capability, the commitment of industry end users and opportunities for early stage venture capital investment.

A sustained increase in university research in other industries would require greater targeted funding from government and industry in priority areas through strategically oriented funding with industry involvement. The recently established industry Growth Centres are potentially a move in this direction, as would be funding for manufacturing that gives priority to advanced manufacturing, and for ICT with priority for enabling digital transformation across all industries.

The importance of collaboration between entities in the innovation system is well made in submissions. While some universities have deep long term collaborative arrangements with global businesses, many Australian businesses take a short-term transactional view of acquiring research outputs. Businesses and universities must give greater attention to building longer-term engagement on the basis of understanding each other's distinctive missions and the creation of trust. Collaboration will be enhanced by the development of personal interactions and relationships between industry and university leaders.

A number of submissions have suggested a high level, national, coordinated approach to innovation with a body having responsibility for developing an overarching strategy and investment plan. Ideas and proposals in this context include supporting the development of STEM skills, improving industry-university engagement and advocating support for translation of research into application. Nor is the value of design, social sciences and humanities overlooked, with increasing emphasis in advanced economies on various types of non-technological innovation such as new business models, systems integration and high performance work and management practices.

Best regards

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