Australian Government

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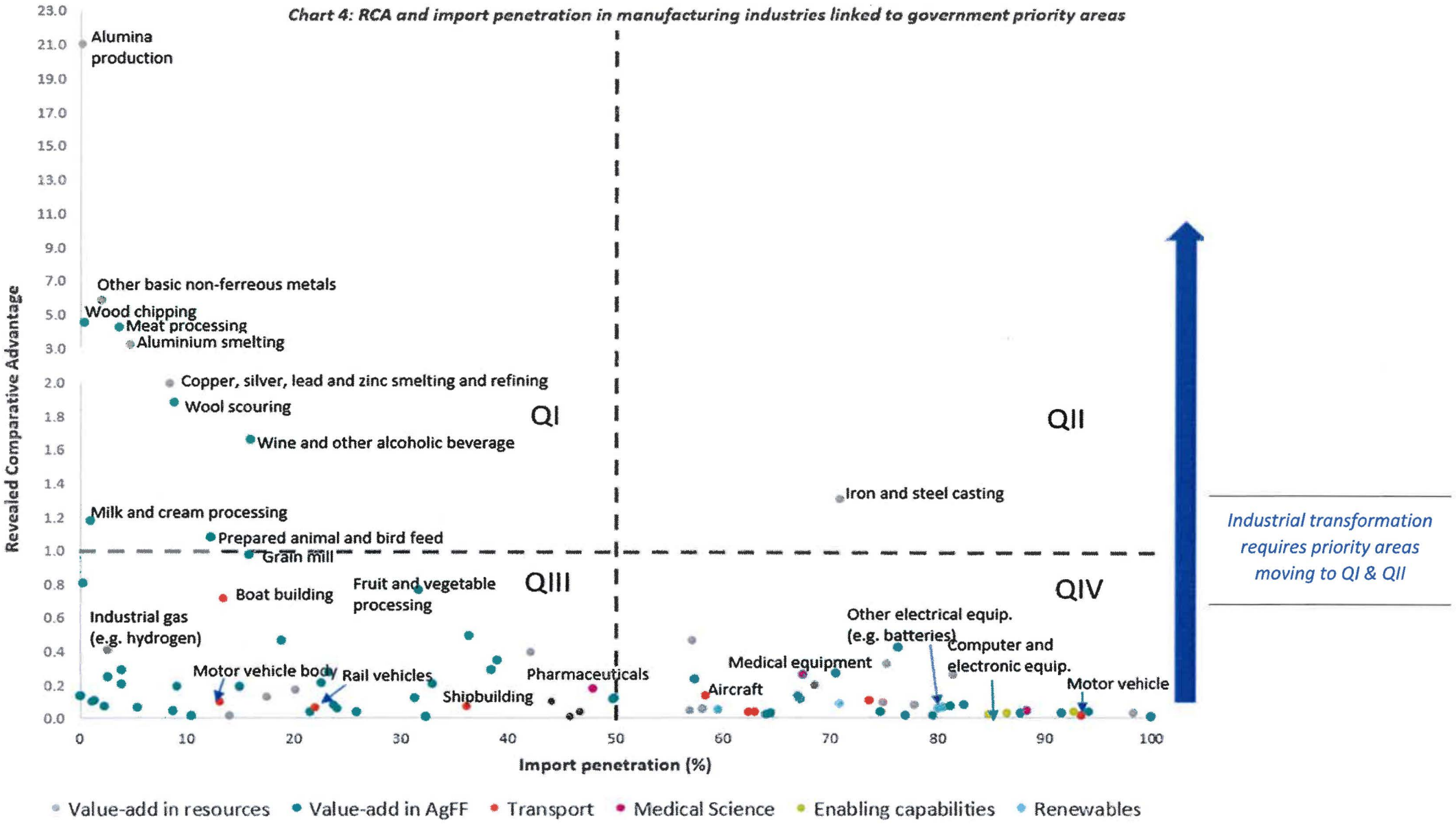
Barriers to collaboration and commercialisation

Industry Innovation and Science Australia

Chart 4: RCA and import penetration in manufacturing industries linked to government priority areas



Industrial transformation requires priority areas moving to QI & QII

Chart 4 illustrates the different market conditions and the likely corresponding innovation required to achieve industry transformation and diversification. It is our view that stable transformation arises by making a strategic choice for economic development based on high value rather than low cost. High-value strategies create and extend markets while low-cost approaches invite commoditisation and insecurity. Relevant policy may include nudging businesses to move toward a focus on high-value products in niche and growing markets (**Quadrant II**).

- **Quadrant I – includes businesses operating in industries that are already competitive.**
  - At a minimum, these businesses would need to continuously pursue and adopt incremental new-to-business innovations to maintain their competitiveness.
    - Examples of these are food processing manufacturing and wool scouring (both part of the value-add in agriculture priority area) and primary metal manufacturing such as copper refining which is critical input for renewable technologies (part of the value-add in resources priority area).
    - In food processing, for instance, incremental innovations such as line extensions, packaging changes, new flavours and other operational improvements could simplify supply chains, enhance sustainability and reduce costs. In contrast, new-to-market innovation would involve investment in disruptive innovations to address social issues such as hunger and accommodate emerging markets, such as plant-based meats, insect protein bars, synthetic fat replacers and precision fermented milk proteins.
- **Quadrant II – includes businesses that are highly competitive, specialised in niche markets and facing intense competition.**
  - At a minimum, these businesses would need to pursue and adopt incremental innovations to remain competitive in their niche markets; for example, differentiating through product quality and technological advancements.
    - Iron and steel casting is the only subsector that falls within this category. This subsector manufactures cast iron and steel components based on a technique that allows manufacturers to produce components with complex geometries, tailored to customer requirements and specific markets. Cast iron and steel components are used in wind turbine systems, aircraft engine parts and defence equipment, among other uses and markets.
- **Quadrant III – includes businesses operating in low competitiveness industries that face no to moderate import competition and are focused on the domestic market.**
  - These businesses would require disruptive innovations to scale up and compete in international markets. Examples of these are transport equipment manufacturing (vehicle body and trailer manufacturing), boat building and pharmaceutical products. For example, the domestic manufacturing of vehicle body and trailer manufacturing is mainly oriented toward the production of caravans and trailers for domestic household consumption.
    - Pharmaceuticals also fall within this quadrant. This is because imports satisfy around 50% of Australian domestic market, and Australian exports represent 0.7% and 0.4% of total Australian and global exports, respectively.[16] The COVID-19 pandemic highlighted

[16] Export shares sourced from unpublished Department of Industry, Science and Resources data. Export shares refer to 2021 year. Import penetration based on Australian Bureau of Statistics (ABS) (2023) (reference period 2020-21 financial year) *Australian National Accounts: Input-Output Tables* [data set], ABS website, accessed 24 November 2023.

Australia's dependence on global pharmaceutical supply chains. Despite this, exports of medicinal and pharmaceutical products have increased at a faster pace than overall Australian exports in the last two decades. Over the period 2000 to 2022, the annual average growth rate of pharmaceutical exports was 9.1%, while Australian total exports' annual average growth rate was 8.4%.[17] This is consistent with patent activity, which shows that applications for pharmaceuticals patents have been on a growth trajectory since 2014, growing from 1,834 patent filings in 2014 to 4,465 in 2022.[18] Australia has a comparative advantage in certain pharmaceutical products, including medicaments, vitamins and alkaloids.

- **Quadrant IV – includes businesses that operate in industries that are not internationally competitive and face significant import competition.**
  - These businesses would require disruptive innovations to support capability building to compete on value rather than cost or price. Sectors in this quadrant include medical equipment manufacturing (for example personal protective equipment, hospital bed manufacturing and other manufactured consumables). In 2021, the medical equipment industry shares of total Australian and global exports were 0.3% and 0.6% respectively.[19] IISA interviews with businesses highlighted the difficulty businesses face in commercialising medical devices in international markets due to lack of product testing in Australia's small domestic market. The medical equipment industry is largely fragmented, based on specialised manufacturers that require a highly skilled workforce and ongoing investment in R&D to be competitive.[20] Australia has a comparative advantage in certain medical devices such as therapeutic respiration apparatus, breathing appliances and gas masks.

Risk-taking in pioneering enterprises for global markets

Australia's industrial transformation relies on businesses improving their performance in priority areas of the economy (**Quadrants III and IV**). We recommend that policy address market dynamics and business strategy to invigorate collaborative innovation.

Businesses operating in domestic-market-focused sectors with no significant import competitive pressures (**Quadrant III**) can meet domestic demand without innovation, disincentivising external collaboration to pursue radical innovations.[21] A similar case is evident in those low-competitive domestic-market-focused sectors that face significant import competition (**Quadrant IV**). Import competition may create dilemmas for businesses in low-competitive sectors to choose between short-term low-cost strategies or high-risk innovation strategies. Our observation is that businesses will respond to importation pressures by reducing research and development efforts.[22] Additional evidence reinforces the observation that management responds to import competition by competing on cost and price.

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[17] Australian Bureau of Statistics (Reference period: 2000 to 2022) 'Table 12a. Australia', *International Trade in Goods and Services*, Australian Bureau of Statistics, accessed 23 November 2023.
[18] IP Australia (2023) *Australian Intellectual Property Report 2023: Patents*, IP Australia, last accessed 24 November 2023.
[19] Unpublished data, Department of Industry, Science and Resources
[20] IBISWorld (2023) *C2412 – Medical and Surgical Equipment Manufacturing in Australia*, IBISWorld, last accessed 24 November 2023.
[21] Cuervo-Cazurra A and Rui H (2017) 'Barriers to absorptive capacity in emerging market firms', *Journal of World Business*, 52(6):727–742.
[22] Nobuaki and Isamu (2017), 'Innovation responses of Japanese firms to Chinese import competition', *The World Economy*, 43(1):60–80.