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# Forces behind South Australia's unusual structural changes since 1840

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# Forces behind South Australia's unusual structural changes since 1840

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**Abstract**

The agricultural sector's share of GDP in growing economies typically declines but, for a century from the early 1850s, Australia's did not. That trend is most evident for the former colony and now State of South Australia (SA). Moreover, that share for SA has been almost flat since 1980 as well, along with the agricultural sector's share of SA exports. This paper seeks to shed light on the forces behind the unusual evolution of these sectoral shares for SA both up to 1950 and since 1980. The extensive time series data compiled for this paper suggest various partial explanations. For 1850-1950 they include the huge arable land area per worker, clearly defined and enforced property rights in settled rural areas as the frontier of European settlement expanded, the absence of a need to do any processing of the main 19th century exports (copper, wool and wheat), a strong public agricultural research and extension system, and the absence of major mining booms after the copper finds in the 1840s and 1860s.

**Keywords:** structural transformation, agricultural development, sectoral productivity growth, trade costs, mining booms, manufacturing protection

**JEL codes:** F13, F63, N47, O13, Q17

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## 1. Introduction

Structural changes in the high-income Australian economy over the past two centuries are unusual even compared with those of other lightly populated regions that were taken over by Europeans post-Columbus (McLean 2013). In particular, unlike almost any other country enjoying intensive economic growth, agriculture's share of GDP in the growing Australian economy did not decline for a century from the early 1850s – even though thereafter that sector's share of the nation's GDP fell steadily, as did its share of employment and exports, just as in other advanced economies (Anderson 2024).

That long plateau in the share of agriculture in Australia's growing GDP was not uniform across the various colonies/states of Australia, however. Indeed trends differed considerably, both preceding and following those colonies' Federation in 1901 into six states.

While each of those colonies/states would make an interesting case study, this article focuses on South Australia (hereafter SA). It does so not only because that colony/state had the longest period with its agricultural sector barely declining, but also because it has had the highest agricultural share of GDP among all the mainland states over most of the past 180 years (Figure 1). Moreover, that share for SA has been well above that for other European-settled New World countries (Figure 2). And during the most-recent half century, its agricultural shares of the State's GDP and employment remained flat at around 5% while for the other mainland Australian states those shares declined from around 5% to barely 2%. As well, over the decade to 2024, the share of agriculture in South Australia's merchandise exports has been rising rather than falling, and has averaged around four times agriculture's share for the rest of Australia.

[insert Figures 1 and 2 around here]

SA is unusual also in several other respects that together make it worthy of closer study. It is the only part of Australia that was colonised by free settlers rather than by convicts. Their settlement was organised in advance in London in the 1830s, where land was initially sold to would-be settlers, site-unseen, until a total of £55,000 was raised by 1836. Half of the proceeds from those and subsequent land and mine-site sales were placed in an Immigration Fund that funded free passage for skilled labourers and their families to migrate to the colony. SA's GDP per capita was well above the rest of Australia's in the first 15 years after white settlement began in 1836, and again in the 1870s, with growth in each of those periods due to a local copper mining export boom. In recent decades, though, the SA economy has been characterized – relative to other Australian states – as slow in both its overall economic growth and its structural transformation away from agriculture.

The purpose of this article is to begin to identify the forces behind SA's unusual structural changes since 1840, especially relative to simultaneous transformations in the rest of Australia's expanding economy and in other European-settled New World' countries. Key SA features include the absence of de-agriculturalization during its copper mining booms in the 1840s and 1860s/70s (as also happened in Victoria in its 1850s gold rush, but in contrast to Western Australia in the 1890s and from the 1960s), its relatively high share of GDP from manufacturing since Federation, its slow economic growth and structural change since the mid-1980s, the absence of any subsequent major SA mining booms over the past 15 decades, and a more than halving in its share of the national population (from 15.7% in 1850 to 10% in 1896, 8% in 1996 and 6.9% in 2024).

The article is structured as follows. Section 2 presents a summary of the data that reveal the nature and extent of numerous unusual features of SA's structural transformation to be explained. Section 3 outlines what trade and development theory suggests would happen to the sectoral structure of an economy as it grows, Section 4 examines data that shed light on various possible forces behind SA's structural transformation trends and cycles, particularly during the ten decades to 1950 but also the period since 1980. The final section summarizes and concludes.

## 2. Unusual features of SA's economic development to explain

The British formally began colonising SA in December 1836, half a century after the arrival of Britain's first fleet in New South Wales. It was the only part of Australia that was colonised at the outset by free settlers rather than by convicts. Their settlement was organised in advance in London. Importantly, revenue from land sales was invested both in essential public infrastructure, which lowered costs of getting rural produce to the capital city and to ports, and in subsidizing labourers to migrate to the colony.[1] Customs and excise duties also were invested in roads, ports and railways.

SA's GDP per capita was well above the rest of Australia's during the first 15 years of settlement. A brief recession in the early 1840s was followed by the discovery of copper north of Adelaide, leading to Australia's first mining export boom. A second copper boom began in the 1860s such that, in the 1870s, SA's GDP per capita was again well above the average for the rest of Australia.

[1] Even though it was assumed that land in the colony was the Crown's to sell, the Letters Patent recognised the rights of the "Aboriginal Natives to live unhindered within the Province of South Australia". At that time there were perhaps only 700 Kaurna aboriginal people on the Adelaide plains and 3000 neighbouring Ngarrindjeri people, many having died from the preceding spread along the River Murray of infectious diseases (Lockwood 2017, p. 66). As early as 1839 the settler population in SA was more than treble that aboriginal number.

Thereafter, however, SA has had no significant mining booms. That contributed to its GDP per capita dropping to just 83% of the national average in the two decades preceding Federation when Western Australia had its first mining boom and averaging around 90% in the 20th century (Figure A1).[2] The State's growth has slowed in recent decades too: between 1990 and 2024, for example, its per capita GDP growth rate was one-ninth below the declining national average rate.

That growth of the economy has been affected by its openness to trade. The SA colony was a relatively open economy until the present century. Between 1857 (when data became available) and 1909, an average of two-fifths of SA's exports went to the colonies to its east. But even focusing on just overseas exports, SA was more trade intensive than the rest of Australia for the ten decades to 1970. The next two decades saw its export intensity slow, but that openness index grew more rapidly than that for the rest of the country in the 1990s (Figure A2(a)), thanks in part to the dramatic growth in wine exports. Since then, however, SA exports have grown relatively slowly. In fact the ratio of exports to GDP has been declining in SA throughout the present century, in contrast to the rest of Australia, and whether or not services are included (Figure A2(b)).

As in all growing economies, the sectoral compositions of GDP, employment and exports have altered significantly over time. But they have done so quite differently in the various colonies/states of Australia. The agricultural share of GDP was flattest for longest in South Australia, from the late 1840s to the early 1950s, averaging 30% of the GDP of that colony and then State – compared with 24% for Australia as a whole. True, in 1842 and 1845 copper was discovered in Kapunda and Burra,[3] respectively, shrinking agriculture's share of SA's GDP from 43% to 29% in just five years and replacing wool in the latter 1840s as that colony's dominant export. Those two mines' production continued until 1878, but an additional copper discovery in the Moonta-Wallaroo region in 1860 added substantially to the colony's mineral outputs such that SA's copper production per capita stayed well above that for the rest of Australia until 1920 (Figure A3). However, mining thereafter played a relatively minor role in SA's development in the remainder of the 20th century. Meanwhile, rises in Australia's protection from import competition during the middle half of that century encouraged manufacturing, particularly in SA where extensive post-war immigration raised the State's share of the nation's population by one-ninth.

Annual employment data by sector and colony/state are scarce historically, but they are available quarterly from the mid-1980s. Agriculture's share of total employment in SA has steadily declined since 1984, halving over that period from

[2] Figure and Table numbers preceded by an A are available in the online Supplementary Material.
[3] The so-called 'monster mine' at Burra was for a time considered the richest copper mine in the world, and was the first mine in Australia to pay dividends to shareholders – who were mainly SA residents (O'Neil 2024).

8% to 4%. But for Australia as a whole, that share has fallen by more than two-thirds, from above 6% to below 2% (Figure 3).

[insert Figure 3 around here]

These structural transformations are partly reflected in the composition of exports.[4] The past six decades have seen the agricultural share of Australia's merchandise exports decline from more than 80% to less than 15% (Figure A4). For SA, the agricultural share of its exports also averaged around 80% in the early 1950s – up significantly from its average of 69% over the previous 100 years (Figure 4). However, in contrast to the rest of Australia, and despite wool almost disappearing as an export item in SA as elsewhere, the agricultural share of SA merchandise exports has ranged between 40% and 50% since 1990 and averaged 46% compared with Australia's 22%. Meanwhile, mining's share of SA exports averaged just 34% over that period compared with 60% for Australia as a whole (Figure 5).[5] As a result, SA's share of national agricultural exports rose from 9.6% in 1990-95 to 10.7% in 2020-25. By contrast, SA's share of the nation's exports of nonfarm goods fell from 4.4% in 1990-95 to 1.7% in 2020-25.

[insert Figures 4 and 5 around here]

Those data for goods ignore services trade, however. Services exports have almost doubled their share of total (goods plus services) exports this century in SA, to 24% by 2024, in contrast to their share for Australia as a whole which has fallen from 25% at the turn of the century to less than 20% since 2020 (Figure 6). Educational services have dominated services export growth in SA, rising from 2% to 14% of all goods and services exports. That compares with their growth for Australia as a whole from 3% to just 8%.

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[4] While agricultural GDP and employment data refer to the primary sector (which includes forestry, fishing and hunting although those three sub-sectors have contributed less than 5% of the sector's total GDP and employment), agricultural exports also include items processed into basic foods and beverages (mostly wine in SA's case). This difference in treatment – which has been adopted by statistics agencies globally – is deemed necessary because many farm products are not internationally tradeable until their first-stage transformation. For the same reason, non-ferrous metals are included in what is defined as mining exports. Non-ferrous metals have been a non-trivial part of SA's mining exports, some of the raw material for which comes from mines near Broken Hill across the border in New South Wales.

[5] Apart from real GDP, all other GDP and export data are expressed in current prices throughout (i.e., not constant or deflated), so as to capture the combined effects of changes in quantities and prices. Unless otherwise indicated in the text, figures or tables, the historical macroeconomic and sectoral data on Australia's economy have been compiled from Butlin and Sinclair (1986), Vamplew (1987), Sinclair (2009), Butlin, Dixon and Lloyd (2015), and updated from ABS, ABARES and DFAT data. Years shown are calendar years to 1913 and fiscal years ending on 30 June thereafter. The pound, which was the currency up to 14 February 1966, are converted to Australian dollar equivalents simply by multiplying by two.

[insert Figure 6 around here]

The international competitiveness of SA agricultural exports, as for Australia as a whole, was strongest initially in non-perishable products that were not labour intensive in their production (because real wages were high in this peripheral labour-scarce economy) *and* that had a high-enough price per ton or per cubic metre to cope with the high cost of transport within Australia to the ports and then to the main markets in high-income Europe (Blainey 1966). Hence the 19th century dominance of wool in SA's overseas exports before and subsequent to the copper booms, with wheat+flour also being important and both remaining so through the first half of the 20th century. In the 21st century, by contrast, grains and especially wool have been contributing a far smaller share of SA exports as wine and other agrifood production expanded (Figure 4(b)).

Prior to Federation, the colony of SA had export markets very close to hand, namely in Victoria and New South Wales. In the half-century to 1909 (years for which annual data are available), an average of 40% of SA's exports went to those interstate jurisdictions. Indeed, SA's small population contributed between a third and a half of Australia's wheat and barley production in that period (Figure A5), while accounting for less than 11% of Australia's population. During 1901-1950, SA still accounted for 29% of all Australian wheat + flour exports abroad.

In that first half of the 20th century, agriculture's share of SA exports averaged the same as for Australia, at 70%. But since 1990, when that Australian share averaged 22%, SA's share fluctuated between two-fifths and two-thirds and averaged 47% (Figure 5). In the most-recent decade to 2025, only Victoria had a similarly high share of its merchandise exports coming from agriculture of around 50%: Tasmania's share is only half as large, and the shares for the other states are less than one-fifth (Figure A6).

An important contributor to the retention of SA's agricultural export share since the 1980s is wine. SA has always had a near-majority share of Australia's winegrapes and wine production, and has produced more than ten times as much per capita as the rest of Australia (Figure A7(d)). Hence when the country's wine industry successfully launched its *Strategy 2025* in 1996 and wine production and exports exploded, SA agriculture benefitted disproportionately.[6] Even though the wine industry has been in decline recently (Anderson 2018, 2025), wine's contribution to SA exports was substantial over the first two decades of this century (Figure 4(b)).

In short, the relatively slow-growing SA economy since 1980 has remained more agricultural than the rest of Australia. Strikingly, since 1990 the trend in the agricultural share of its GDP has been flat, averaging 5.6%, whereas that share for

[6] SA's share of the value of Australian wine exports averaged 64% during 1990-2025.

the rest of Australia has fallen from 4.2% to 2.2%. And since the early 1990s, agriculture's share of national merchandise exports has halved from around 30% as the share of mining jumped from below 50% to almost 80%. By contrast, SA's agricultural share of exports has remained in the 40-50% range, and its mining share (which includes non-ferrous metals) has risen only to around two-fifths. Meanwhile, manufacturing's share of exports has fallen more for SA than for other states, from around 30% to 8% (Figure 4(b)).

The dramatic de-agriculturalization in other states is partly explained by the mining boom this century, something that has been much less dramatic for SA. Manufacturing's share of GDP has fallen over 1990-2024 from 21% to 6% in SA compared with a less-steep fall nationally, from 14% to 5%. SA's services sector has thus moved from being well below the national GDP share in 1990 (70% vs 77%) to above by 2024 (85% vs 81%). But even accounting for the relatively rapid services export growth in SA, agriculture's share of all exports by the state have remained around 40% (Figure 6(a)).

## 3. Structural transformation of a growing economy: theory

Structural change is an economy-wide phenomenon, involving the interaction between changes in domestic factor supplies (natural resource capital, produced physical and human capital, and labour time), technologies, consumer preferences, international product and input prices, and foreign exchange rates. Also, changes in trade policies, and in producer or consumer subsidies or taxes, can cause movements along supply and demand curves for each sector as they alter the gap between domestic and international relative prices of sectoral outputs.

The normal pattern of structural transformation of a growing economy is for the agricultural sector's initial dominance to decline as workers are attracted to higher earnings in industrial and service activities (Anderson 1987, Anderson and Ponnusamy 2023). Lewis (1954), for example, assumed this is because non-farm labour productivity is relatively high and improves with industrial capital accumulation or importation faster than can be offset by off-farm migration. Later in the development process, the manufacturing sector's shares of GDP and employment decline as well. Development economists, including in Australia, began tracing that pattern of structural transformation many decades ago (Fisher 1939; Clark 1940; Kuznets 1957; Chenery 1960). They note also that agriculture's employment share typically exceeds its GDP share (Timmer 2009; Deininger, Jin and Ma 2022), whereas the GDP shares of both manufacturing and mining typically exceed their employment shares.

Those features of development are consistent with the pattern of country-year annual data on sectoral shares of GDP and employment for many countries as their per capita incomes grew (Herrendorf, Rogerson and Valentinyi 2014). Growing economies also saw their agricultural share of exports decline on average, although the experiences were more varied once countries moved beyond low-income status (Figure S4 in Anderson 2024).

A four-sector model of an economy with well-accepted demand elasticities can explain those features. Think first of it being a closed economy producing farm and non-farm products and subject to sectoral productivity growth, then open that economy to international trade, and then expand it to include a sector producing nontradable products and a mining sector.

Start by considering a closed economy with only two sectors, agriculture and non-agriculture, and assume a fixed supply of natural resource capital, produced capital and labour time. If its economic growth was due to exogenous productivity growth occurring equally rapidly in both sectors, the sectoral supply curves would shift out at the same rate. However, assuming the price and income elasticities of demand for farm products are below one, the demand curve is steeper and shifts out less for agricultural goods than for other products following productivity-improving income growth. Thus outputs of both sectors rise but less so for agriculture, and the price of non-farm products rises relative to the price of farm products; and they do so more, the more price inelastic is the demand for food and the more the income and price elasticities of food demand fall further as per capita income rises (Matsuyama 2019). Were there to be a faster rate of reduction in marginal costs of production in agriculture than in the rest of the economy (as suggested by the empirical work of Martin and Mitra 2001 and Gollin, Parente and Rogerson 2002), agriculture's GDP share would fall even further because of the low elasticities of demand for that sector's outputs.

If that small economy had sufficiently low trade costs as to be able to export a share of its production or import a share of its consumption of both farm and non-farm products at the prevailing international terms of trade at its border, it would have a larger share of its GDP coming from agriculture the stronger its comparative advantage in farm products, and conversely for non-farm products. In that case, agriculture's share of GDP would rise or fall over time depending only on whether that economy's productivity growth was biased toward farm or non-farm production. But if economic growth in the rest of the world was lowering the price of farm products relative to the price of non-farm products, as happened throughout the 20$^{th}$ century (Pfaffenzeller, Newbolt and Rayner 2007), that would increase the likelihood of agriculture's GDP share declining in this small open economy.

In reality, a large part of even the most advanced economies involves the production and consumption of nontradable goods and services because of these products' prohibitively high trade costs. The prices of nontradables are determined solely by domestic demand and supply conditions and related policies, because the quantity demanded has to equal the quantity produced domestically. If one were to combine the two tradable sectors in the above 2-sector economy into one "super sector" of tradables, then the closed economy conclusion, that agriculture's share of GDP is likely to decline over time, will be stronger if the share of tradables in GDP declines in this open growing economy. The income elasticity of demand for marketed services—which make up the vast majority of nontradables—is well above unity in developing countries and tends to converge toward unity as incomes grow (Lluch, Powell and Williams 1977, Table 3.12; Lee 2026). If productivity growth were to be equally rapid for nontradables as for tradables, while demand grew faster for nontradables than for tradables, both the price and quantity and hence the value of nontradables would increase relative to that of tradables. But if productivity growth was faster in tradables than in nontradables (as suggested by the findings for services by Fuchs 1980 and Kravis, Heston and Summers 1983), it is even more likely the real exchange rate (the price of nontradables relative to tradables) would appreciate and the share of nontradables in GDP would rise. Since in that case the share of tradables in GDP would fall, it is even more likely that agriculture's share also would decline in such an economy.

Suppose the other tradable sector is manufacturing. Then at the global level the income elasticity of demand for manufactured consumer goods also matters via its effect on the international terms of trade. While that elasticity may be above one in low-income countries, it falls increasingly below one as countries and thus the world becomes more affluent. Hence, the manufacturing sector is also likely—thanks to the nature of demand for services—to come under pressure to decline eventually even in a small open economy as it become affluent, following the pattern for agriculture. Even if manufacturing productivity growth was exceptionally rapid in that economy, there is the possibility of faster consequent growth in those economies' demand for nontradables pulling more resources out of manufacturing as well as agriculture.

If in addition to farming and manufacturing there is also a mining sector, using specific natural resource capital (mineral deposits) in addition to inter-sectorally mobile labour and produced capital, primary mineral products also could be exported from this economy and more so the better-endowed per worker the economy is with mineral resources versus agricultural land and the lower the costs of trading outputs from mining relative to those from other sectors.

If the stock of natural resource capital is unchanged, rapid growth of produced capital (physical capital plus human skills and technological knowledge) per hour

of available labour tends to strengthen comparative advantage in non-primary products (Leamer 1987). By contrast, a discovery of more minerals or energy raw materials (or a rise in the international price of mining products) would strengthen that economy's comparative advantage in mining and weaken its comparative advantage in agricultural and manufactured products, other things equal (the so-called 'Dutch disease'). Such a shock would also boost the economy's income and hence the demand for nontradables, which would cause its sectorally mobile resources to move into the production of more nontradable goods and services, further reducing farm and industrial production (Corden 1984) – and conversely when a mine is exhausted or there is a downturn in the international price of mining products.

The more a resource-rich economy directs some of its investment in capital to forms that are specific to primary production,[7] the later its comparative advantage would shift from primary products to tradable manufactured goods or services. This is all the more likely, as real wages rise, if new technologies developed increasingly save labour more for the primary sectors than for other sectors.

Structural transformation of an economy can also be influenced by government responses to changing objectives of society that change its infrastructure, economic institutions, and policies such as taxes, subsidies, regulations or quantitative restrictions on the production, consumption or trade of products or of the factors or intermediate inputs used to produce those products.

In short, the above theory suggests agriculture's shares of a small open economy's GDP and exports would decline more slowly:

- the faster its quality-adjusted stocks of natural resource and produced capital needed specifically for agricultural production increase relative to endowments of sectorally mobile labour and other factors of production;
- the faster is productivity growth in its farm sector's value chain compared with that in other sectors producing tradables; and
- the more local producer prices of its farm products rise compared with those for other sectors, including through changes in trade costs and in industry support policies.

[7] The accessible stock of natural resource capital can be expanded through mining exploration, or made more productive through investments induced in response to rising relative prices of primary products. Examples are the clearing and fencing of farmable land, developing a system of roads or rail lines, and creating or importing new mining or farming technologies. Those ways of extending the natural resource frontier in lightly populated economies were commonly accompanied, through linkages to varying extents (according to the 'staples' model), by growth in closely related manufacturing (e.g., processing of primary products) and service activities (Findlay and Lundahl 2001).

## 4. Forces behind changes in sectoral shares of SA's GDP, employment and exports

With the above survey of economic development and trade theory in mind, we turn now to the evidence available to help us understand the forces behind SA's unusual structural changes since 1840, including relative to simultaneous transformations in Australia's other five colonial/state economies. Complete time series of annual data over the past two centuries are available for only a small number of pertinent endogenous and exogenous variables, hence comprehensive econometric analysis is not possible. Empirical attention is thus confined to shedding light just on the forces behind the evolution of sectoral shares in SA's GDP, employment and exports, as depicted above in Figures 1 to 6 and the online supplementary figures.

### *4.1 Per worker endowments of natural resource capital and public infrastructure*

From the outset of European settlement in SA, the economy was very open to inflows of financial capital and (at least British and German) settlers, both capitalists and variously skilled labourers. Perceived rewards from migration were the driving force behind these inflows. Those perceptions in the 19th century were formed from favourable reports of evolving economic and social conditions in the colony. Especially important were reports on natural resource abundance per worker and liberal regulations governing access to them, and on profits/earnings from engaging in production, employment and trade in the various sectors of the economy.

Land and mineral resources were assumed by the colony's planners to be the Crown's. Land was initially sold in London to would-be settlers, and then to immigrants, at £1 per acre for Sections of 134 rural acres each (plus a town acre in Adelaide). That price also applied to mine sites. Half the proceeds from land and mine-site sales were placed in an Immigration Fund that was used to provide free passage for labourers and their families to migrate to the colony. That was crucial for agriculture during the copper boom because otherwise more workers would have been attracted away from farms to mines. Much of the rest was invested in public infrastructure, including that which was essential for exporting the key items over the coming decades of wool, copper and grain.

For agriculture, the quality of the land available for farming, and the associated water and climate, are crucial. It gradually came to be understood that SA is the driest state in Australia, and that its soils were among the world's poorest. Even today less than 5% of the State's surface area is cropped, and two-thirds of the rest is under perpetual leases for very sparse sheep and cattle grazing. SA remains one of the world's least densely populated jurisdictions, with 54 ha per capita in

2022 compared with 28 ha in the rest of Australia and 1.6 ha globally. In 1850 SA's relative abundance of land was even greater: 1545 ha per capita compared with 11 ha globally. True, SA's population multiplied eleven-fold between 1850 and 1950,[8] but even so its crop area per capita grew rapidly to the 1880s before it plateaued. It has been twice the Australian average since World War II (Figure A8(c)).

Crucial to exploiting that abundance of natural resources per capita was the development of secure property rights over farmed land and mineral deposits (along with reducing transport costs, see Sub-section 4.3 below). Property rights began by surveying land and establishing titles within the city of Adelaide (completed in March 1837) and then in nearby rural areas. Setting a low minimum price (£1 per acre) discouraged speculation and encouraged people with capital to make the move to South Australia. The rollout of securely enforced land titles over the first few decades of settlement was systematic, working outwards from Adelaide, thereby keeping to a minimum the cost of building roads and later railways. During that rollout, pastoral leases were offered for yet-to-be-surveyed rural land from 1846. Initially those leases were for just one year, but in 1850 they were made available for up to 14 years, and by the late 1880s for 21 years with the right of renewal for a further 21 years.

Several acts of parliament were important in governing the evolution of property rights. One was the Real Property Act of 1858, which established the so-called Torrens system under which the Government issued a certificate of title for each parcel of land and guaranteed its validity. Then the Scrub Lands Act of 1866 and the Strangways Act of 1869 encouraged the development of agricultural areas beyond existing freehold land. They did so with a credit system (20% deposit and the balance at the end of four years), but stipulated that no-one could hold more than one square mile (640 acres or 260 hectares) on credit at one time, so as to encourage closer settlement. These conditions were extended in 1872 to apply to all land south of the so-called Goyder's Line (roughly the 10 inch or 250ml rainfall isohyet). They thereby encouraged extensive growth, including cropping in what later proved to be marginal in some low-rainfall regions (Meinig 1962).

The South-Eastern Drainage Act of 1875 was another milestone: it provided funds to build and maintain drains to the sea such that wetlands in the southeast of the colony could become far more agriculturally productive (Abbott 1986). As well, in the early 1880s a former Governor (Jervois) invested in some private drainage of the swamps along the lower reaches of the Murray River; and from 1905 the Lands Department continued that effort until all but the small swamps near

[8] That compares with a doubling for the world as a whole, and between five- and six-fold increases for Latin America, South Africa, Canada and the United States. Only Argentina (16-fold) and New Zealand (21-fold) saw larger population increases than SA or Australia over those ten decades (Inklaar et al. 2018).

Murray Bridge had been reclaimed for grazing dairy cows.

As the demand for farming land grew, previously issued government leases were systematically resumed by the Government. While graziers did not like having their runs sub-divided into farms, lessees were compensated and some graziers were then able to bid higher than new farmers and so gain freehold title to land they had formerly leased.

The Crown Lands Consolidation Act of the late 1880s established four district land boards, followed by a permanent Pastoral Board which was created by the Pastoral Act of 1893. That board classified the land, fixed the area, rent and purchase price, and determined who the successful applicants would be. The lessee could purchase their leased land at any time after the first six years at a minimum price of five shillings per acre (one-quarter of the minimum price that had been fixed at £1 per acre in 1834). That right of purchase was subsequently removed, but some leases were made perpetual. While this arrangement relieved the lessee of the need to raise capital to buy the land, at the same time it secured for the Government the option of exercising some control over that land's future use.

The last major land policy development in the 19th century was the Closer Settlement Act of 1897, which focused on large areas of potentially good farmland owned by pastoralists. This Act remained helpful through the first half of the 20$^{th}$ century, particularly in making it possible for the government to settle returned servicemen on farmland after the two world wars.

Water management systems had to be introduced from the outset of European settlement in SA. Initially that took the form of wells and dams in the areas surrounding Adelaide, to cope with the region's dry summers (Smith 2007). Horticulture and viticulture were advanced further with the establishment on the River Murray by the Chaffey Brothers of Renmark in 1888 and by the SA Government of several other nearby villages by 1895. Those settlements had varying degrees of difficulty in pumping irrigation water from the Murray River so, following the Federation Drought of 1892-1902, an Interstate Royal Commission on Waters of the River Murray laid the groundwork for management arrangements subsequently set out in the River Murray Waters Agreement. In 1908 the SA Government began to establish irrigated fruit blocks in the Riverland. Irrigation was organized in district or community schemes with a central pumping system and channels to distribute water by gravity to individual farms. It took until the late 1960s before those channels began to be replaced with much-more-efficient pipelines. In the meantime, six locks were built in SA in the 1920s and 1930s, prompting vegetation clearance for irrigated horticulture that caused naturally saline groundwater to rise, reducing the frequency and duration of floods that had previously leached salt away from the plant root zone. The SA Department of Agricul-

ture opened a new Research Centre at Loxton in 1971 to boost its irrigation research and extension efforts, which led to a complete rethink on irrigation management to improve water use efficiency and productivity. In 1976 a new SA Water Resources Act required the conversion of area-based water licences to volumetric water allocations and facilitated the trading of river water between irrigators. That trading of river water licences has been controversial, but it is gradually improving the efficiency of water use by irrigators (Wheeler 2022). Since then tradable water licences have been established also for dams and bores in wetter parts of SA such as the Mt Lofty Ranges and the South East, thereby separating out the water asset from each farm's land property right. The past 13 decades have thus seen some gradual improvements in the productivity of SA's water use on farms, even though controversies continue with respect to the volumes of river water to be retained for NSW and Victoria irrigators on the one hand and, on the other hand, the volumes to be allowed through the Murray mouth for the benefit of the environment.

In the case of minerals, private enterprise was initially relied on to locate and develop SA's mineral resources, with the crown retaining control only over gold and silver. But the colonial government required that the land encasing the copper find near Burra be purchased as a 20,000-acre lot at £1 per acre. That meant a broad group of investors had to get together to become owners of the Burra copper company, which thereby spread the subsequent economic benefits of mining that site and helped avoid corruption and rent-seeking (Harris and La Croix 2021). A similar outcome emerged from SA's second copper boom that started in the 1860s near Moonta.

From the 1860s a belief began to emerge that mineral wealth belonged to all residents. So in 1882 a government Geological Survey of SA was formed to search for payable mineral deposits and water supplies, and by 1888 parliament had alienated all mineral rights to the Crown. After a royal commission, a School of Mines was established in Adelaide in 1889 in the hope of reversing the mining sector's slowdown, and a Department of Mines was established in 1894 to regulate and further encourage mining in the colony (O'Neil 2024).

Once public ownership over minerals was asserted, private enterprise sought various forms of government assistance, including financial subsidies, rewards for discoveries, and the selection of mining sites. These public-private partnerships contributed to the establishment of key rural towns. For example, iron ore mining by the Broken Hill Proprietary Co. Ltd. (BHP) at Iron Knob from 1899 led to the development of Whyalla as an industrial city; and the rise of Port Pirie (still the world's largest lead smelter) was directly connected to the mines at Broken Hill. A search for coal at Leigh Creek commenced in 1890 (and resumed in 1941). The Electricity Trust of South Australia took over administration of that coalfield in

1948 and then constructed the Port Augusta Power Station to utilise its coal. In the early

In more-recent decades, the mining sector in SA has been challenged increasingly on environmental issues. The most famous example accompanied the development of the potentially massive Olympic Dam copper–uranium–gold–silver–lead deposits on Roxby Downs Station following their discovery in 1975. Such have been the strictures placed increasingly on its development by the State Government, particularly regarding the risk of artesian water depletion, that BHP has yet to fully exploit this globally significant mine.[9] Those strictures may have dampened investment in other mineral exploration and exploitation in SA too, especially compared with the opportunities that have been taken up in Western Australia over the past half century.

Given SA's land abundance per worker, theory suggests its competitiveness in manufacturing within Australia and internationally would be relatively weak. But that expectation is tempered somewhat by the absence of extensive mineral developments over the past 130 years, especially relative to Western Australia and Queensland. The consequent dependence of the economy on rural industries temped the SA government in the middle one-third of the 20th century to aggressively encourage industrial development in the State. The nature and consequences of that intervention are discussed below in Section 4.4.

### *4.2 Sectoral productivity growth*

In the latter half of the 19th century, Australia became the envy of the New World in terms of the productivity of its sheep industry. Wire fencing helped selective breeding and quality upgrading of livestock (Pickard 2010). Vermin fences began to be built in the 1880s to protect livestock from foxes and dingos, and were brought together by 1946 to create in SA the world's longest fence (2200 km, from near Ceduna in SA's west to the NSW/Qld border in the State's northeast). Meat and milk production were stimulated by refrigerated shipping becoming available from the 1880s. Wheat production was helped enormously by labour-saving machinery that was locally innovated to overcome local issues. SA examples include the invention of the harvester stripper by John Ridley in 1843, and

[9] In October 2025, BHP announced it has proposed to expand its Olympic Dam activities by investing another $840 million in the site, with a view to doubling the mine's copper production. A few months later, following the Federal Government's passage of new pro-union industrial relations legislation and its insistence on dictating how the plant's energy would be sourced, BHP announced it would postpone that investment at least until the early 2030s (Gottliebsen 2026).

the stump-jump plough by the Smith brothers in 1876 (which, with scrub rollers, lowered greatly the cost of bringing SA's mallee scrub lands into cultivation).[10]

Public agricultural research and associated tertiary education began to supplement the impact of farmer innovations, beginning with the establishment of Roseworthy Agricultural College in 1883. It was the first of its kind in Australia and, by 1891, offered a Bachelor of Science in Agriculture (Pratley and Archer 2017, Pratley 2021).[11] Its first Director identified in the 1880s the value of applying phosphate fertilisers when sowing wheat. That technology, which was successfully demonstrated in the field by the Correll brothers at Minlaton in 1890, led to a long-term reversal in what had been a decline for some time in wheat yields.

Around the same time more-focused exchanges began between agriculturalists in SA and climatically similar Mediterranean countries. The rich genetic diversity of Mediterranean forages provided seeds for several pasture legumes, notably clovers and medics that gradually transformed dryland farming in SA. Byerlee (2022) notes that "by the 1950s, these pasture species had become the core element in integrating crop and livestock farming in SA that greatly increased agricultural productivity and enriched soil fertility."[12]

The University of Adelaide, founded in 1874, established the Waite Agricultural Research Institute in 1924, and the Council for Scientific and Industrial Research (later CSIRO) established its Division of Soils at the Waite campus from 1927. Agricultural Science degrees were awarded from 1932. The Australian Wine Research Institute opened on the Waite campus in 1955.

New ideas from researchers were disseminated promptly thanks to the formation in 1888 of the Agricultural Bureau movement, and then the SA Department of Agriculture in 1902. The latter established eight experimental farms and orchards during 1905-08, and from 1993 much of the research activities of the SA Department of Agriculture (now called Primary Industries and Regions South Australia or PIRSA) were consolidated and co-located on the Waite site as the SA Research and Development Institute (SARDI).

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[10] Just as in other Australian colonies and in high-wage, land-abundant North America, and in contrast to lower-wage, densely populated East Asia, the most successful agricultural technologies were those that saved on labour and boosted yields (Hayami and Ruttan 1985).

[11] SA was the first Australian colony to adopt a public schools Act, in 1850, following the establishment in 1847 of two Anglican private schools (St Peter's and Pulteney). By 1851, 115 public schools had been established in SA. In 1913 land was given to the SA Government by Peter Waite to establish a public agricultural high school at Urrbrae and what became the Waite Agricultural Research Institute of the University of Adelaide. Roseworthy was incorporated into the University of Adelaide in 1991, becoming its second agricultural campus.

[12] For more details, see Puckridge and French (1983). Webber (1990) points out that between the 1930s and the 1970s, wheat yields in SA rose by 50% and wool yields trebled.

Research into trace elements and subterranean clover from the 1930s led to vast areas of previously infertile soil being brought into production in the State's southeast, Kangaroo Island and southern Eyre Peninsula. One area of 160,000 ha in the Upper South East, previously known as the Ninety-Mile Desert, was taken up as a private development by the AMP Society in the 1950s. AMP financed individual family farmers to clear, crop and graze that land in what is now known as the Coonalpyn Downs (Tiver 1986).

The development and widespread adoption of labour-saving farming (and mining) technologies and machinery were encouraged by the high and rising level of real wages in Australia (Duncan 1972). High farm labour productivity in SA was helped at the outset from the assisted immigration of skilled farmers, including from Germany, and by SA being the first Australian economy to legislate (in 1850) for the introduction of public schools. One consequence was that agriculture's share of SA's employment was often below its GDP share – the opposite of what is observed in most developing economies (Deininger, Jin and Ma 2022).

The maintaining of agriculture's share of GDP in SA from 1980, in contrast to its decline in other states, was helped by the state having from the late 1970s the highest level of broadacre *multifactor* farm productivity, and the second-fastest rate of growth in that index after Western Australia (Figure A8).[13]

The standard index of broadacre farm *labour* productivity (the sector's GDP share divided by its employment share) averaged 1.02 for SA and 0.78 for Australia during 1984-2024, implying farm labour productivity in SA was about one-third above the rest of the nation's over that 4-decade period. Even more strikingly, that difference has grown considerably since the 1980s: it rose from around 0.6 in both jurisdictions in 1984 to 1.4 in SA but to just under 1.0 for the rest of Australia by 2025 (Figure A9).

An indicator of farm *land* productivity growth is the rise in yields for the most important crop, namely wheat. Following their fall in the latter half of the 19$^{th}$ century through nutrient depletions, they rose and then plateaued in the next half-century thanks to new varieties, superphosphate and fallowing. They did the same in the next four decades thanks to better rotations, nitrogen fixing via legumes, and improved mechanization. And since 1990 they have accelerated again, especially in SA (Figure A10).

A market consequence of the technological changes that generated that farm productivity growth is a sharp rise in farmland prices. The real price of broadacre farming land has grown much faster in SA than in Australia, increasing more than

[13] While growth in primary factor use and in intermediate inputs were the major contributors to farm output growth in colonial times, farm productivity growth has been the dominant source of growth in Australia's farm output at least since the 1970s (PC 2005).

eight-fold since 1992 compared with less than four-fold for the rest of Australia (Figure A11).

These indicators of relatively very rapid growth in farm labour and land productivity in SA further helps to explain why agriculture's share of GDP in SA has not fallen, unlike in the rest of Australia, since 1980.

### *4.3 Domestic and international trade costs*

During the 19th century especially, the production of many potentially tradable goods was naturally protected from import competition by high transport and communication costs. As that natural protection gradually fell with the lowering of those trade costs, so the ranges of goods exported and imported expanded. The number of exported goods remained small until the closing decades of the 20th century though, thanks to the strong competitiveness of SA's key ones (copper, wool, wheat+flour, then later meat, dairy products and barley).

Public investments in rural infrastructure such as roads, railways, telegraph services, telephones and electricity all gradually lowered internal transport and communication costs. The first public (horse-drawn) railway and the first telegraph lines were erected in the mid-1850s, and the Overland Telegraph to Darwin and connecting to Europe via Jakarta was operational by 1872. Meanwhile, it became SA government policy to provide wheat farmers with access to a railway station or siding, or a coastal port, within 15 miles (24 km) of their properties (Williams 1974).

Ocean shipping costs and travel times shrunk too as steam power and steel hulls replaced wooden sailing ships through the middle half of the 19th century (Jacks, Meissner and Novy 2010). The opening of the Suez Canal in 1869 added to that relative decline in costs of shipping bulky exports from SA to Europe.

Together, SA's relatively rapid farm productivity growth and its decline in trade costs helped the rural sector maintain a high share of SA's exports. Agricultural exports were dominated by wool through to the 1960s (Figure 4), it being the farm enterprise that was perhaps least intensive in its use of scarce labour relative to abundant grazing land. Like copper concentrate, wool also was high valued in terms of its volume and weight. Wheat and then barley were the only other key farm exports until recently. The fact that wool and grain (along with skins, hides and tallow) were able to be exported in raw form meant the farm sector contributed little to the early development of the local manufacturing sector. It took until refrigeration allowed exports of perishable meat and dairy products before the food processing part of SA manufacturing got a significant boost from agriculture.

### *4.4 Relative product prices and sectoral assistance policies*

The international terms of trade for primary producing countries exporting to the United Kingdom and other western European countries in exchange for manufactured goods improved enormously over the 19th century, thanks to the spread of the industrial revolution and the signing of the Cobden-Chevalier Treaty between Britain and France in 1860 (Williamson 2008). That helped farmers in Australia but also in other countries that exported primary products. The 20th century saw the opposite trend in the index of international prices of agricultural products relative to manufactured goods (Pfaffenzeller, Newbolt and Rayner 2007). However, favourable access to the UK market after the signing of the Ottawa Agreement in 1932 benefitted Australian (and other Commonwealth member country) exporters.

Domestic relative prices are not the same as those at the nation's border though, for two reasons. One is that the price of nontradables relative to tradables alters as real per capita incomes change, thanks to the former goods' higher income elasticities of demand. Thus mining sector booms tend to pull mobile resources toward the sector producing nontradables (largely services), which is additional to the pull of mobile resources toward the booming mining sector. However, there was little de-agriculturalization with SA's two copper booms of the early 1840s and the 1860s/early1870s, because much of the government revenue raised from the sale of mining rights was used to attract more immigrant labourers.

The other reason domestic relative prices can differ from those at the nation's border has to do with trade policies. Manufacturing and numerous agricultural industries enjoyed considerable natural protection from import competition in the 19th century and through to and during World War I, thanks to high ocean trade costs. While import tariffs added only a little to that protection in SA during the colonial period (Lloyd 2017), manufacturing tariffs grew very considerably soon after Federation in 1901 (Anderson and Garnaut 1987). The manufacturing sector's nominal rate of assistance trebled between 1919 and 1932, to 63%, while assistance to (mainly import-competing) agricultural industries averaged only around 5% (Lloyd and MacLaren 2015).

Iron and steel were among the assisted industries that evolved in SA, and they also enjoyed bounties from 1909 to 1948 (Lloyd and MacLaren 2015). Effective protection for steelmaking and steel-using manufacturing was raised further in 1938 when the Federal government imposed a ban on exports of iron ore. That ban stayed in place until May 1966 (having been partially lifted in November 1960 – see Lee 2013). It, plus falling non-ferrous metal prices, diverted investments from mining to steel manufacturing: local mining firms invested their huge profits from the previous 3+ decades not in further exploration and new mining technologies so much as in the less-risky downstream processing of minerals and

metals (Blainey 2003, pp. 276-77). Local demand for the latter had expanded during World War I and, together with food processing, they dominated SA's manufacturing output. As a result, the mining sector's contributions to SA's GDP and exports were miniscule during 1920 to 1965 (Figures 1 and 4).

In addition to basic metal products, SA manufacturing was concentrated also on motor vehicles and parts, shipbuilding, and domestic appliances. This meant that, on average, SA's manufacturing sector in the 1970s received above-average effective rates of assistance via import tariff protection (Warhurst 1978). SA was thus more exposed than most other states when tariffs were gradually lowered over subsequent decades.

Policies affecting industry incentives were not restricted to tariffs or quantitative restrictions on imports. Various state governments also have been pro-active from time to time in inducing industrial developments, but perhaps none so actively as the SA government between the 1920s and 1970s, particularly after Sir Richard Butler became Premier in 1927 and throughout the subsequent premiership of Sir Thomas Playford (1938-65). Both premiers adopted numerous measures aimed at attracting manufacturers to SA. One set was aimed at lowering the cost of living for factory workers, especially via creating in 1936 the Housing Trust of SA. The Trust oversaw the building of thousands of low-cost houses and flats each year through to the 1970s, including to the north of Adelaide where it also reserved adjacent land for industrial estates and coordinated the provision of such services as electricity, water and sewerage needed to attract manufacturing investment and migrants to the region around Elizabeth. As a result, SA received a disproportionately large share of post-WW2 migrants, particularly from Britain. The Trust also offered very generous land inducements to keep General Motors and Chrysler from moving motor vehicle manufacturing to the eastern states. Another notable inducement was the provision to BHP of exclusive rights to prospect for iron ore in the Middleback Ranges for decades, upon BHP agreeing in 1958 to build a steel works in Whyalla (Stutchbury 1984).

Those and related SA government incentives to boost manufacturing in SA were sufficient to ensure that sector's share of the state's GDP transitioned from being mostly below that share nationally pre-WW2, consistent with SA's comparative advantage given its very low population density, to being above the national average until early this century (Figure 7). That assistance also contributed to the decline in agriculture's share of state GDP during 1950-80. Its gradual phasedown subsequently contributed to the state's de-industrialization, to the pause in agriculture's relative decline, and to the growth in the service sector's GDP and export shares (Figures 1 and 6). The painful prolonged adjustment to the phasedown in Federal and State government assistance to SA manufacturing also would have contributed to the lowering of SA's share of national GDP by a quarter between 1990 and 2024.

[insert Figure 7 around here]

## 5. Summary and conclusions

This review has revealed a pair of unusual features of SA's structural transformation, namely agriculture's near-constant share of GDP for around 100 years from the early 1850s and its persistent share of the State's GDP and exports since the 1980s.

A key explanator is that SA has always had an exceptionally large endowment of agricultural land per capita. By 1950 it still had more than 30 times the world average when Canada had 13 times and the other New World settler economies had less than 3 times. Of course farm land is not evenly distributed across the world's land surface in terms of quality, but SA's persistent relatively abundant per worker endowment of crop land (2-3 times the high Australian average) has been a strength for SA's agricultural sector over the past 190 years.

Second, the investment of revenue from sales of SA farm land and mining sites in not only subsidizing workers to emigrate to SA but also building trade-cost-lowering rural infrastructure greatly benefitted SA's agricultural competitiveness, as did the phased development and enforcement of clear property rights on farmed land. The subsidy to worker immigration in particular was able to avert a 'Dutch disease' for SA's non-mining sectors during each of the colony's two large copper export booms in the 19$^{th}$ century.

Third, new technologies developed for local conditions boosted SA's agricultural development. Nineteenth century examples include the crop stripper, the stump-jump plough, scrub rollers, the inclusion of phosphatic fertilizer when seeding wheat, and appropriate fencing. Public investments in agricultural research and associated rural education and extension contributed greatly to the stock of pertinent new farm technologies for SA conditions and their prompt dissemination. New cropping technologies in the present century have been effective in raising both land and labour productivity in broadacre farming faster in SA than nationally.

Fourth, the fact that SA's first exports (copper, wool and wheat) were able to be shipped unprocessed meant they did not contribute to boosting the share of manufacturing in GDP. However, SA manufacturing was boosted by Australia's import-protecting trade policy stance from the 1920s to the 1970s, and by various additional forms of SA government assistance to industrial development, which together dampened the state's competitiveness in primary production. After the Playford period ended and tariff protection was reduced in 1972 and gradually phased out from the 1980s, the SA manufacturing sector's importance shrank

rapidly and thereby indirectly contributed to the retention of SA's agricultural GDP and export shares.

And a fifth contributor to the retention since the 1980s of SA's agricultural shares of GDP and exports was the sudden export-led growth in Australia's wine industry, around half of which occurred in SA.

To conclude, it is not clear where SA's comparative advantages will lie in the decades ahead. Agriculture's dominant role to date could be challenged by a future mining boom in SA (e.g. expanding investment at Olympic Dam), particularly if ways are found to reduce water and other environmental risks associated with prospective mining developments. It could also be challenged by a boom in services exports, for example from higher education following the merger of the State's two biggest universities in 2026 to form the mega Adelaide University with its stronger foreign-student focus. Or defence and space sectors could grow rapidly under new government initiatives and new technologies. Any of those booms would alter the structure of SA's economy away from agriculture. But they could also be more or less offset if the recent downturn in investment in public agricultural R&D were to be reversed and complement on-going private R&D investments.

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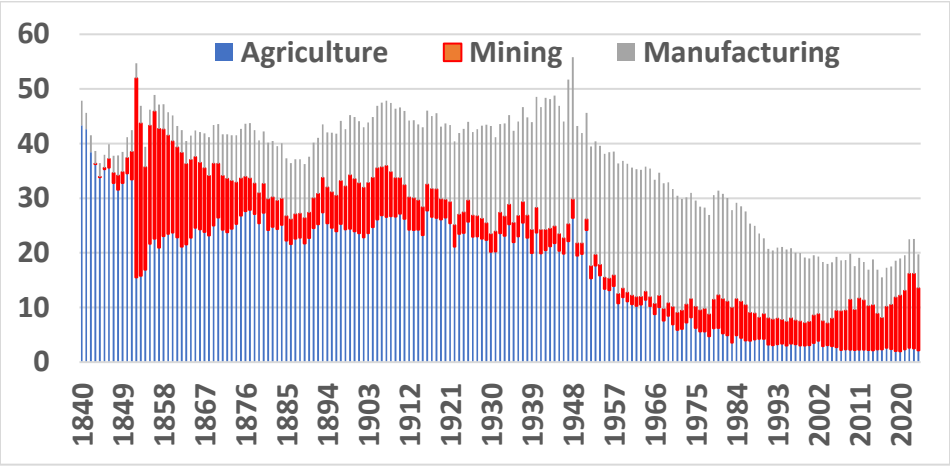
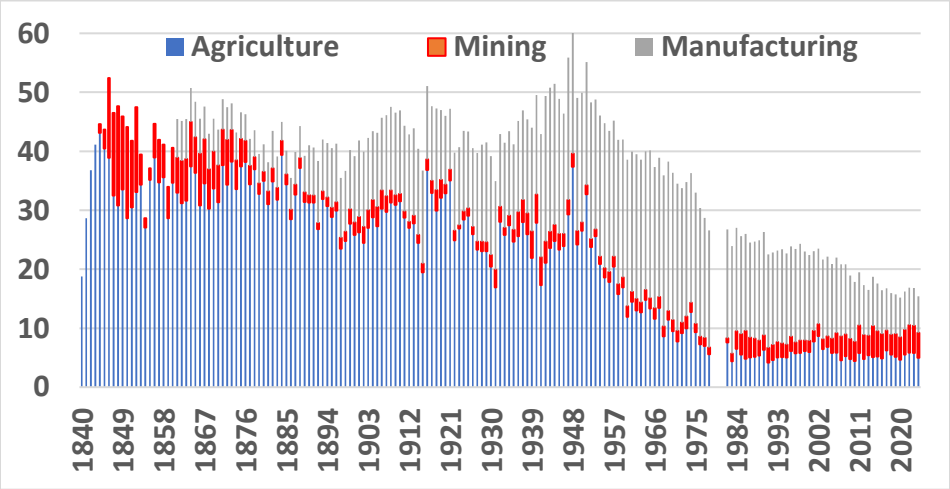
Figure 1: Contributions of agriculture, mining and manufacturing to GDP in Australia and its colonies/states, 1840 to 2024 (%)

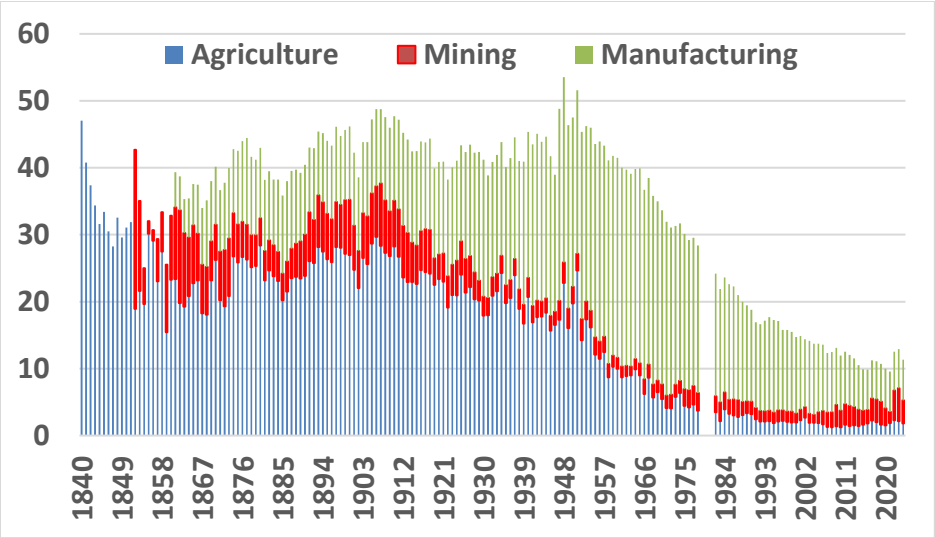
(a) Australia




(b) South Australia



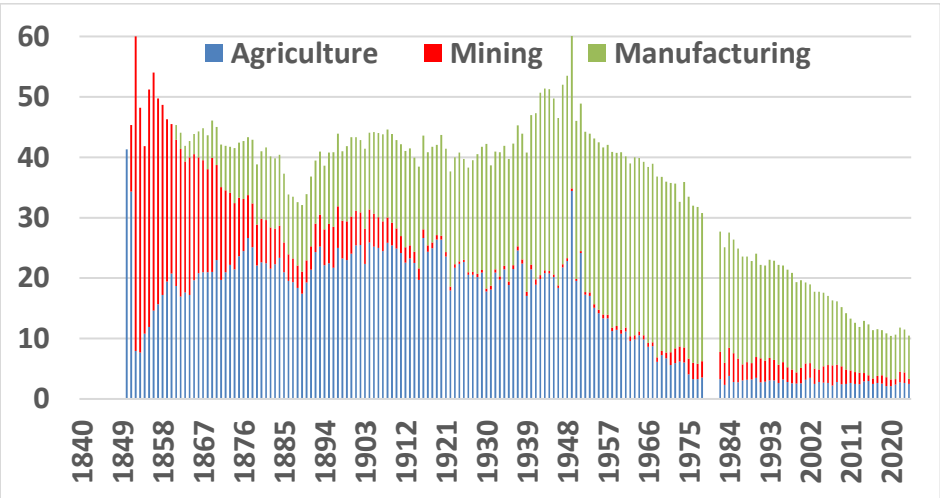

(c) New South Wales



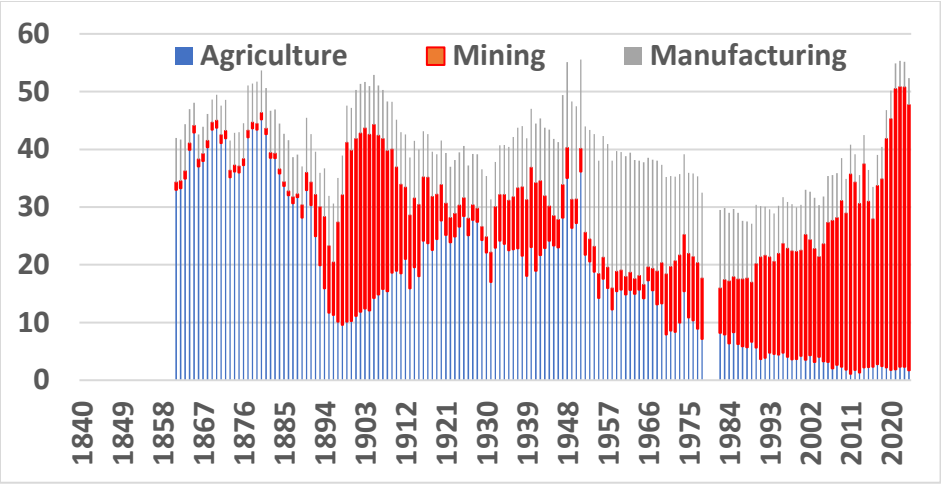

(continued)

Figure 1 (continued): Contributions of agriculture, mining and manufacturing to GDP in Australia and its colonies/states, 1840 to 2024 (%)

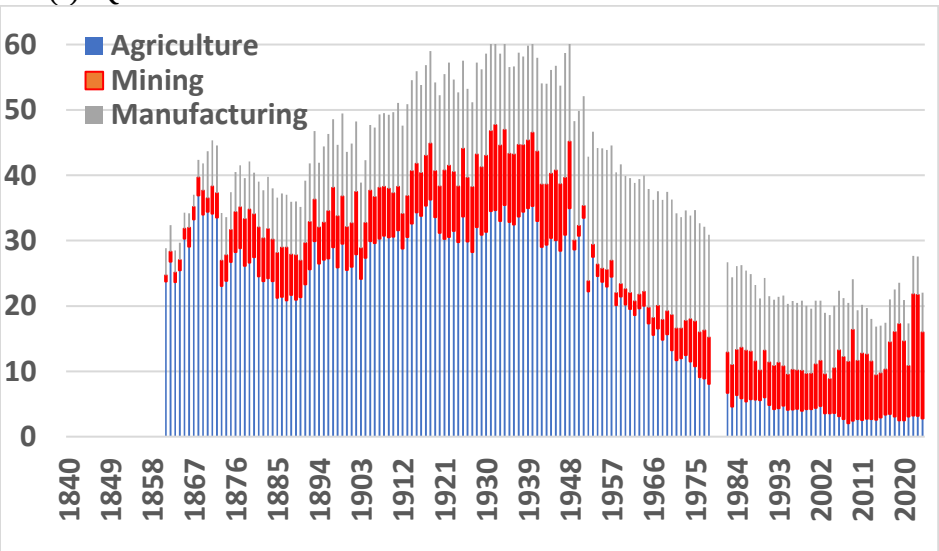
(d) Victoria




(e) Western Australia



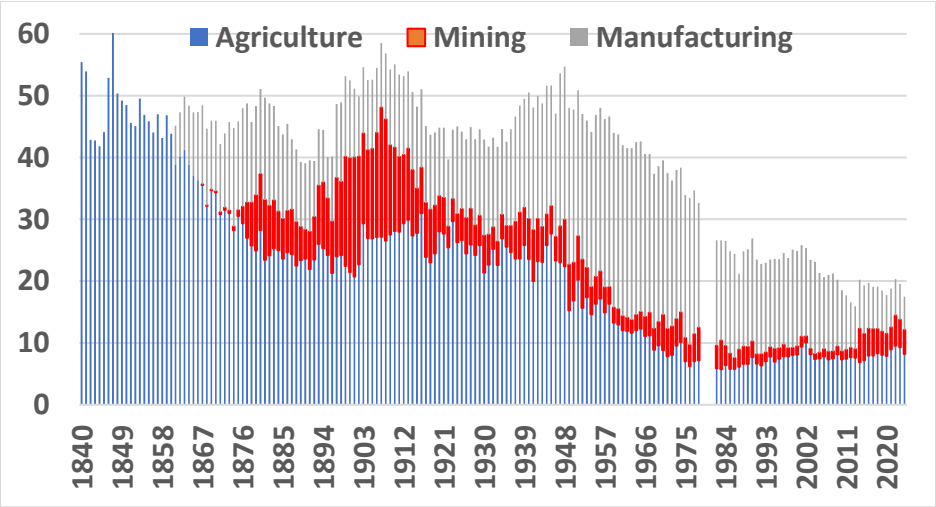

(f) Queensland




(continued)

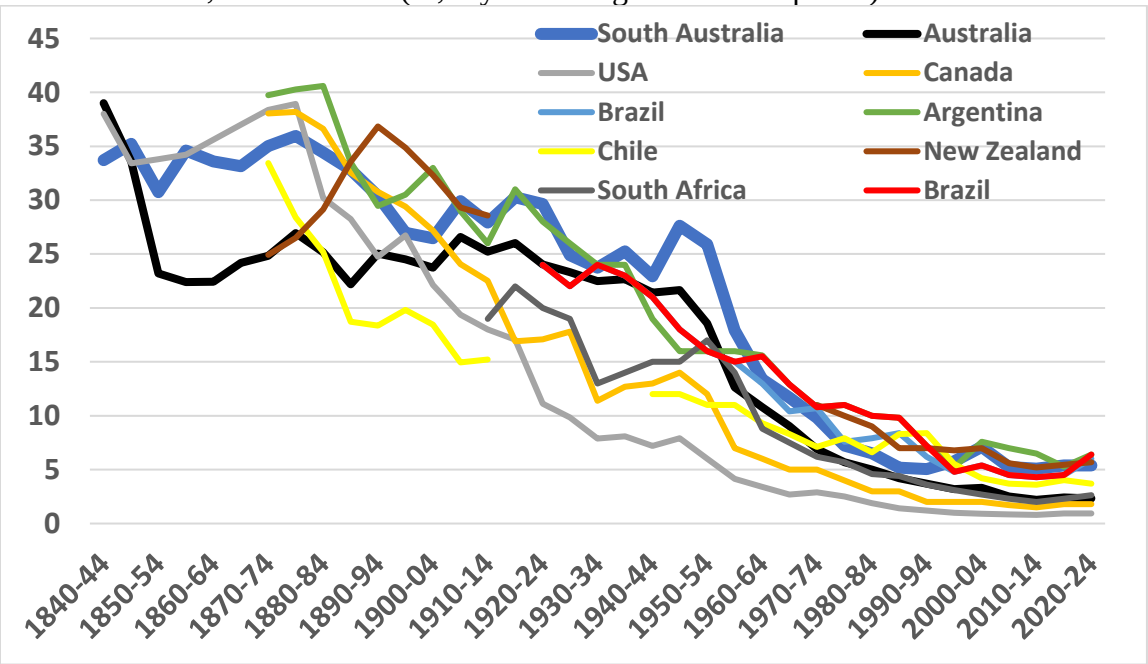
Figure 1 (continued): Contributions of agriculture, mining and manufacturing to GDP in Australia and its colonies/states, 1840 to 2024 (%)

(g) Tasmania



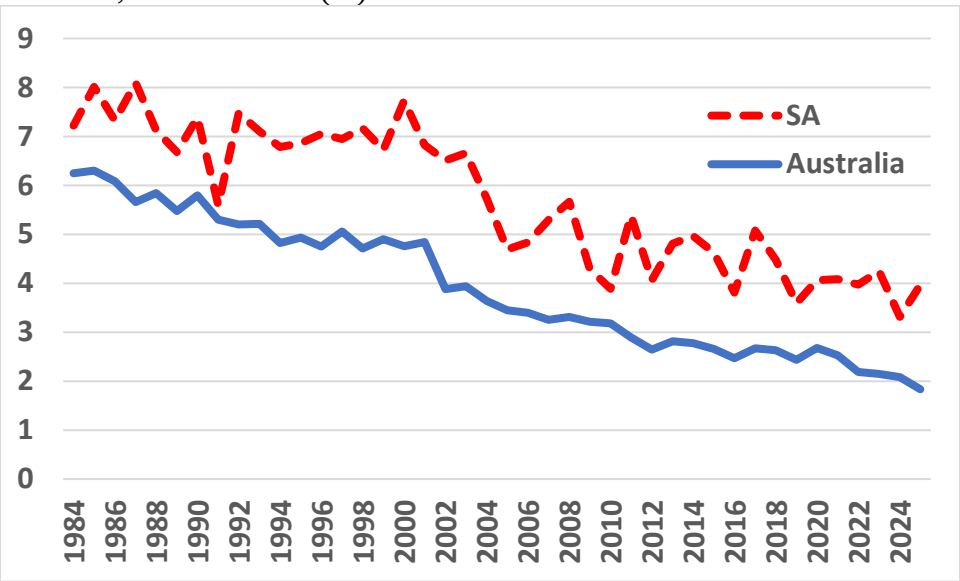

Sources: Butlin and Sinclair (1986), Vamplew (1987), Sinclair (2009), Butlin, Dixon and Lloyd (2015), and updated from ABS.

Figure 2: Agriculture's share of GDP, South Australia, Australia and other New World countries, 1840 to 2024 (%, 5-year averages at current prices)[a]




[a] US shares for the first seven 5-year periods shown are interpolated from estimates by Gallman (1966, Tables 3 and A-1) for 1839 (42.7%), 1849 (33.4%) and 1959 (34.2%), and Mitchell (2005) for 1870-74 (38.4%).
Sources: Author's compilation based on data in Mitchell (2005), Gallman (1966) and World Bank (https://databank.worldbank.org/source/world-development-indicators).

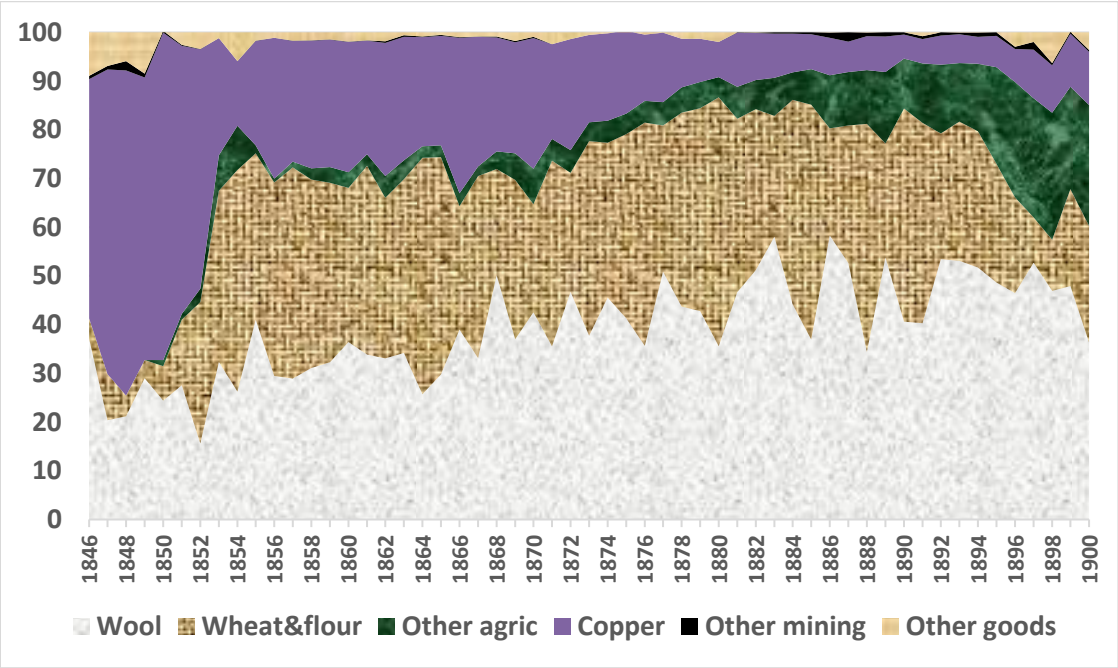
Figure 3: Shares of agriculture in total employment, South Australia and Australia, 1984 to 2025[a] (%)



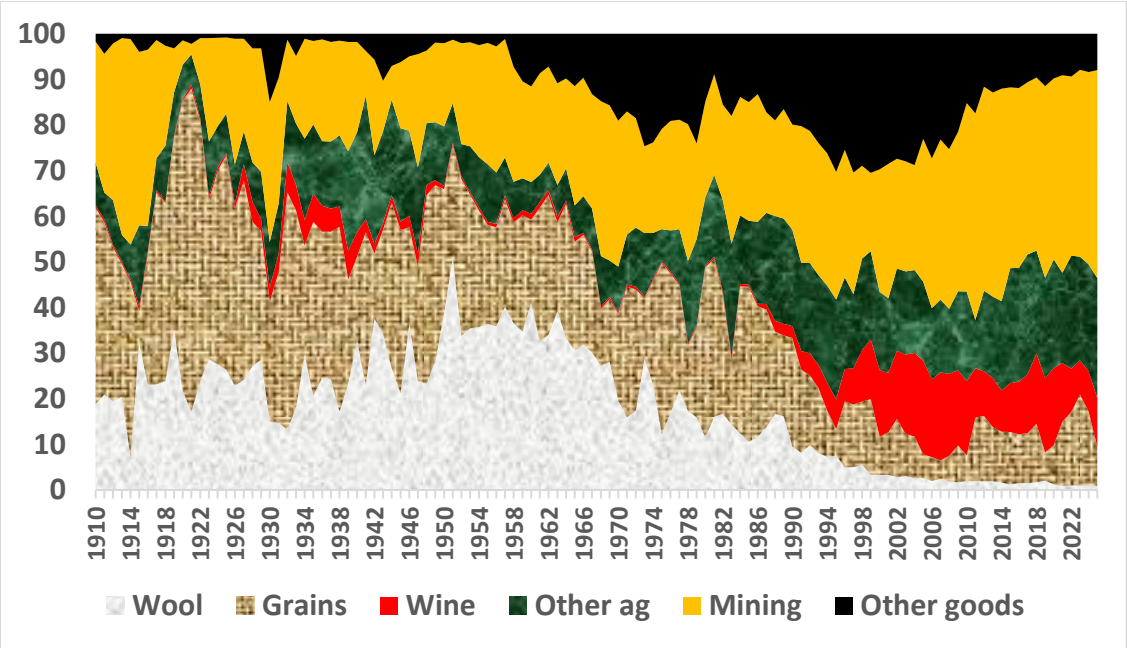

[a] Employment as of November in each fiscal year.
Source: ABS Cat No 6291.0.55.001 (*Labour Force, Australia, Detailed*)

Figure 4: Contributions of wool, grains,[a] other agricultural goods, copper,[b] other mining,[c] and other goods produced in South Australia to the value of its merchandise exports overseas, 1846 to 2025 (%)

(a) 1846 to 1900

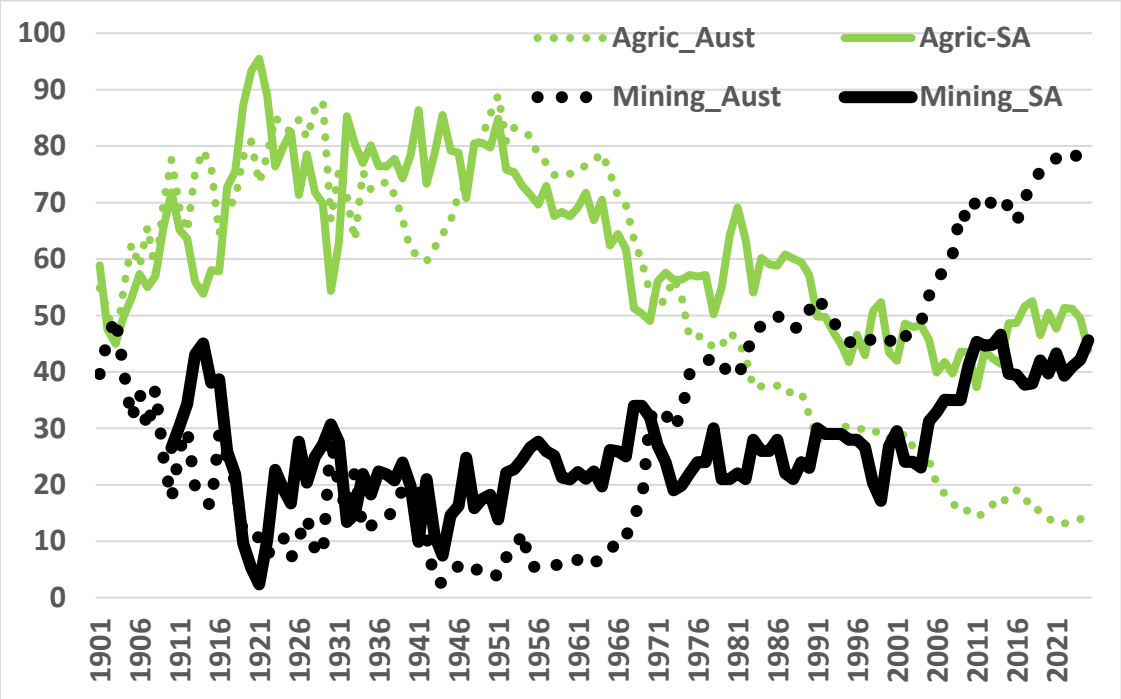



(b) 1910 to 2025




[a] Barley emerged as an export item after World War I and became increasingly important after World War II.
[b] Copper ore and concentrate.
[c] Includes non-ferrous metals from 1910.
Source: South Australian *Statistical Registers* and *South Australian Yearbooks* for data to 1996 and thereafter ABS's Merchandise Exports by Commodity (SITC), Country and State.

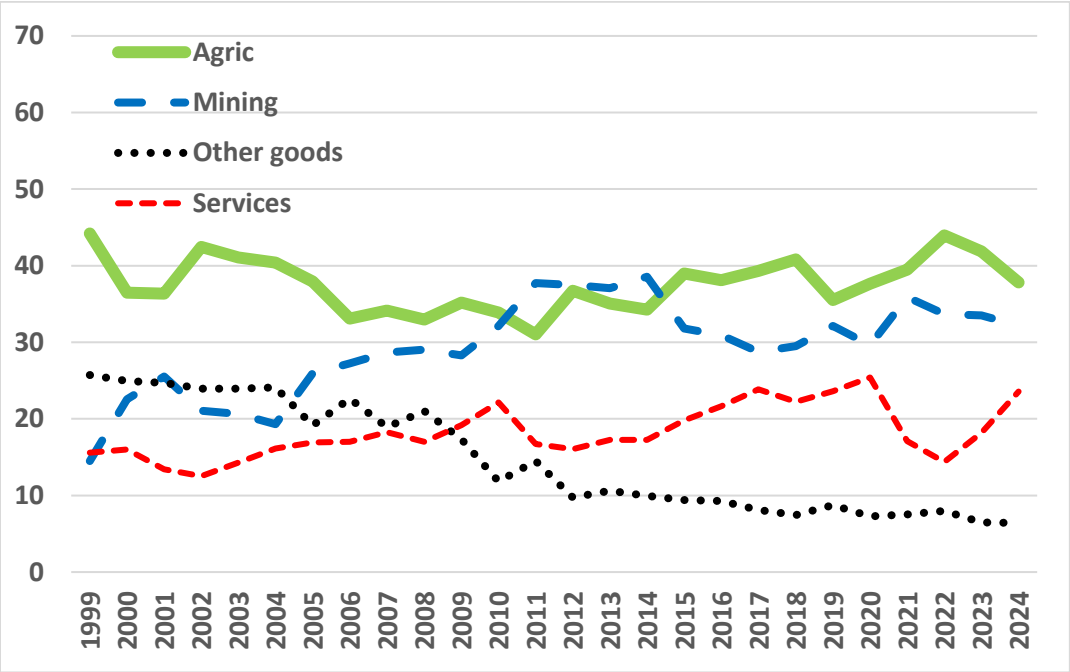
Figure 5: Contribution of agricultural and mining products to the value of South Australia's and Australia's merchandise exports, 1901 to 2025 (%)



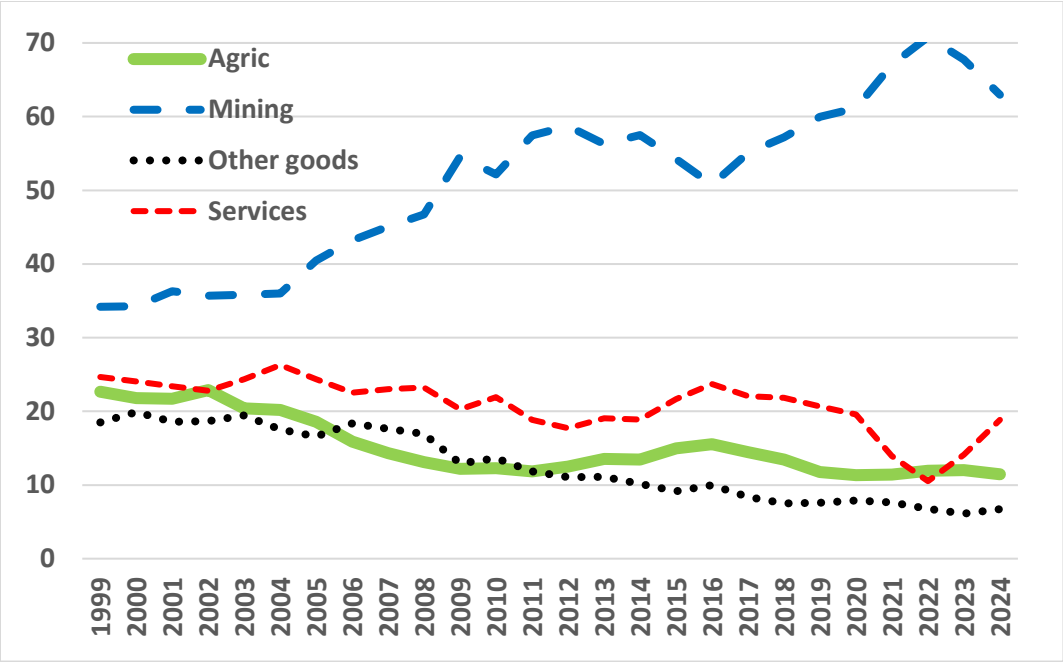

Sources: South Australian *Statistical Registers* and *South Australian Yearbooks* for data to 1996 and thereafter ABS's Merchandise Exports by Commodity (SITC), Country and State.

Figure 6: Contributions of agricultural, mineral, other goods, and services to the value of goods plus services exports, South Australia and Australia, 1999 to 2024 (%)

(a) South Australia

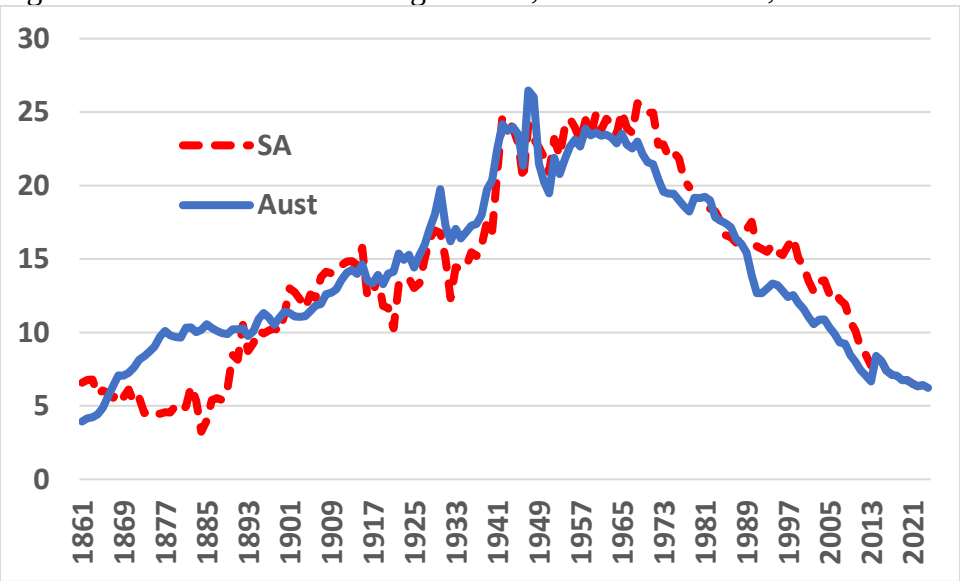



(b) Australia




Source: https://www.abs.gov.au/statistics/economy/international-trade/international-trade-supplementary-information-financial-year/latest-release

Figure 7: Share of manufacturing in GDP, SA and Australia, 1861 to 2024 (%)




Sources: Butlin and Sinclair (1986), Vamplew (1987), Sinclair (2009), Butlin, Dixon and Lloyd (2015), and updated from ABS.

# Forces Behind South Australia's Unusual Structural Changes Since 1840: Supplementary Material

## Supplementary figures

A1: South Australia's shares of Australia's population and real GDP, and its GDP per capita as a % of Australia's, 1840 to 2024
A2: Exports as a % of GDP, South Australia and Australia, 1840 to 2024
A3: A4: Per capita production of copper, South Australia and rest of Australia, 1840 to 1980
A4: Contributions of wool, gold and other goods to Australia's merchandise exports, 1840 to 2024
A5: South Australia's and Australia's wheat, wool and barley production, 1850 to 2022
A6: Agricultural shares of all goods' exports from South Australia and other states of Australia, 2016 to 2025
A7: Agricultural land area, South Australia and Australia, 1842 to 2013
A8: Broadacre farm productivity growth in Australia's states, 1978 to 2024
A9: Agriculture's GDP and employment shares and labour productivity indexes, South Australia and Australia, 1984 to 2024
A10: Wheat yields, South Australia and Australia, 1860s to 2010s
A11: Broadacre farmland prices in South Australia and Australia, 1992 to 2024

## References cited in supplementary figures

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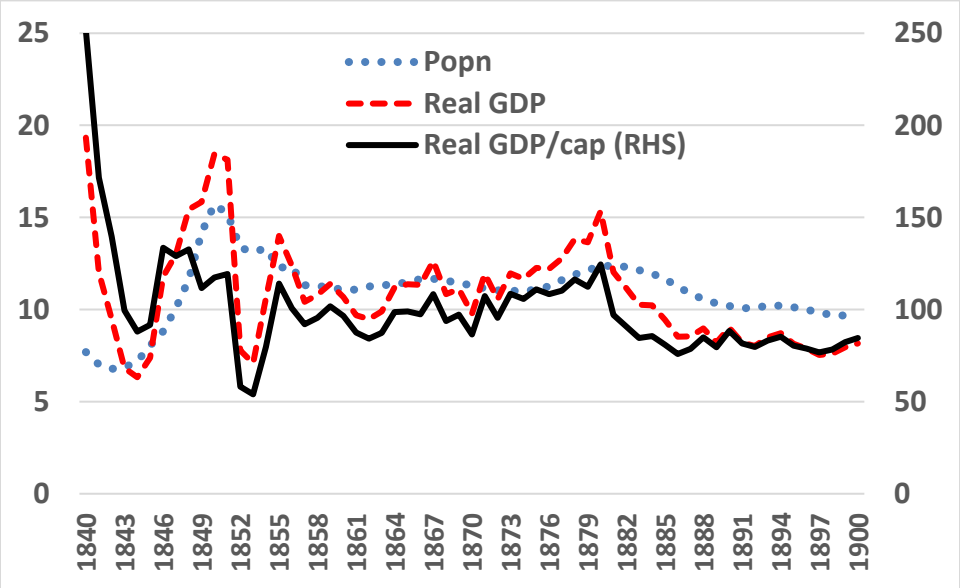
Sinclair, W.A. (2009), *Annual Estimates of Gross Domestic Product: Australian Colonies/States 1861-1976/77,* at http://arrow.monash.edu.au/hdl/1959.1/88855.

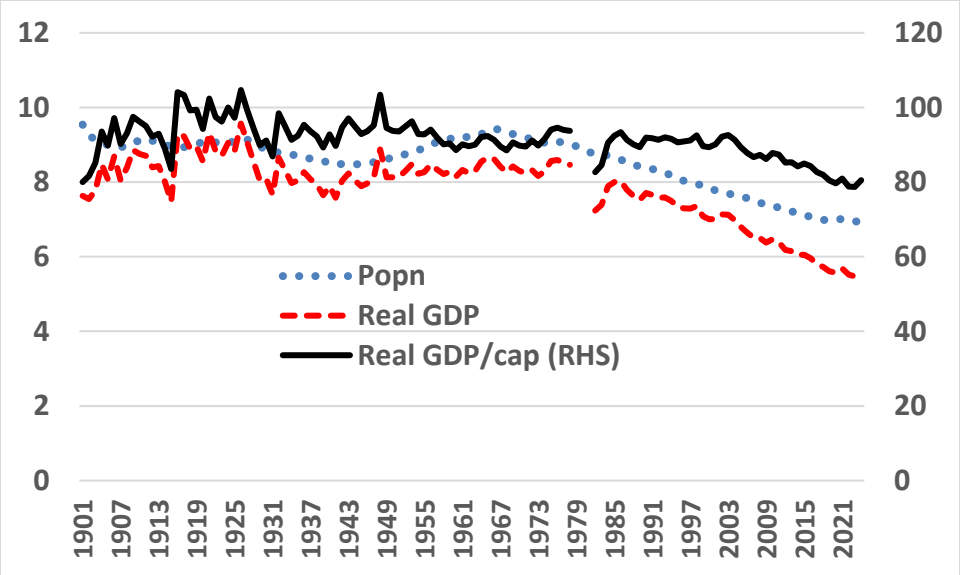
Vamplew, W. (1987), *Australians: Historical Statistics,* Sydney: Fairfax, Syme and Weldon.

Figure A1: South Australia's shares (%) of Australia's population and real GDP, and its GDP per capita as a % of Australia's, 1840 to 2024

(a) 1840 to 1900



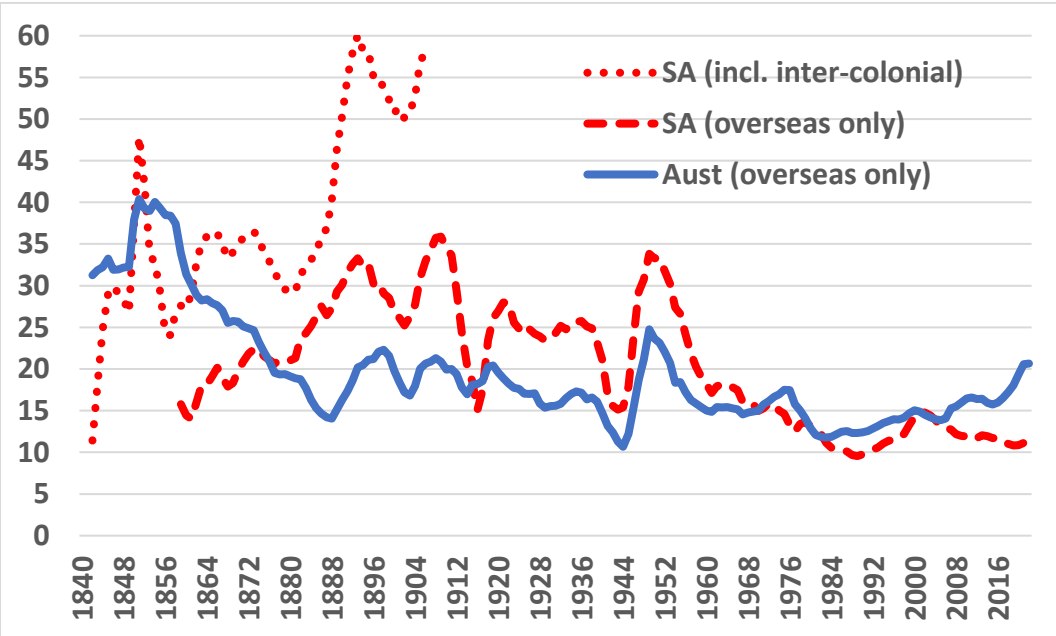

(b) 1901 to 2024



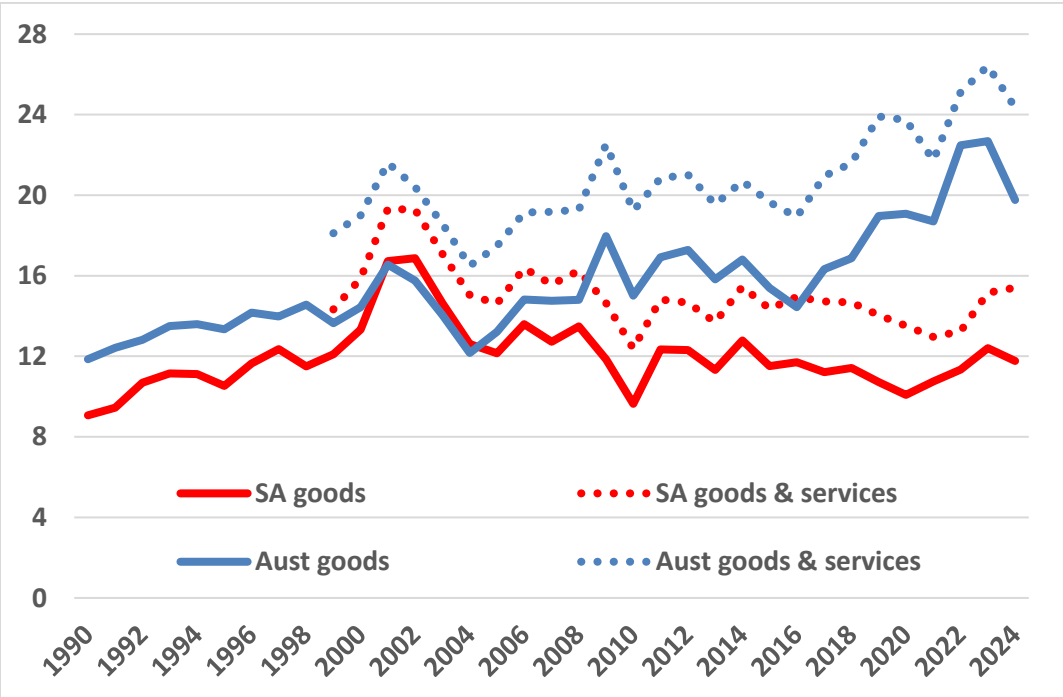

Sources (also for Figure A3): Butlin and Sinclair (1986), Vamplew (1987), Sinclair (2009), Butlin, Dixon and Lloyd (2015), and updated from ABS.

Figure A2: Exports as a % of GDP, South Australia and Australia, 1840 to 2024

(a) Goods exports only, 5-year averages around year shown

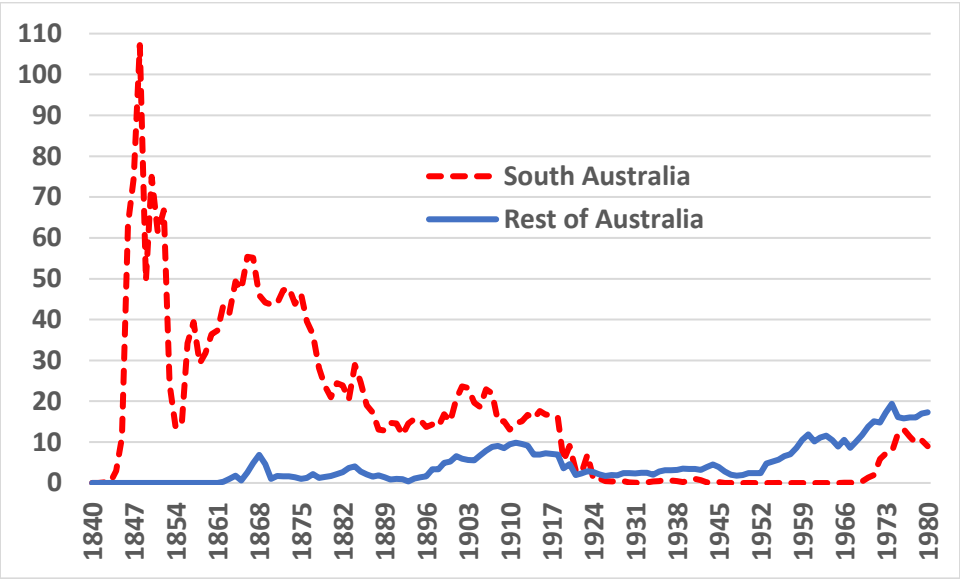



(b) Goods and services exports, annual from 1990




Sources: ABS (Cat. No. 5220.0) and DFAT (https://www.dfat.gov.au/about-us/publications/trade-statistical-pivot-tables).

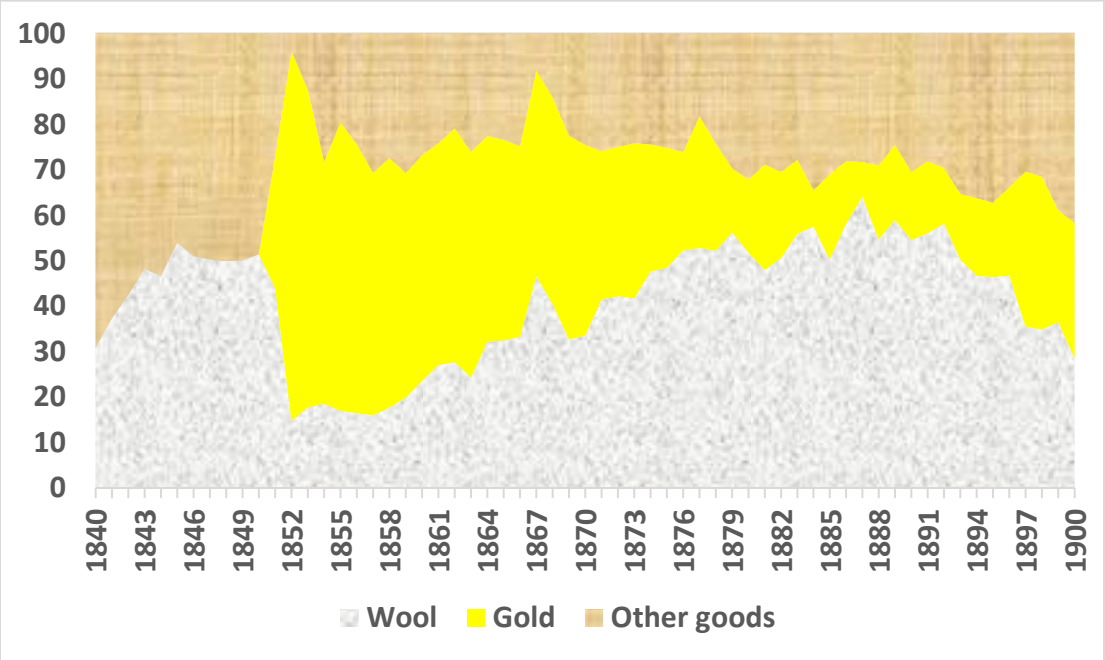
Figure A3: Per capita production of copper, South Australia and rest of Australia, 1840 to 1980 (kgs)



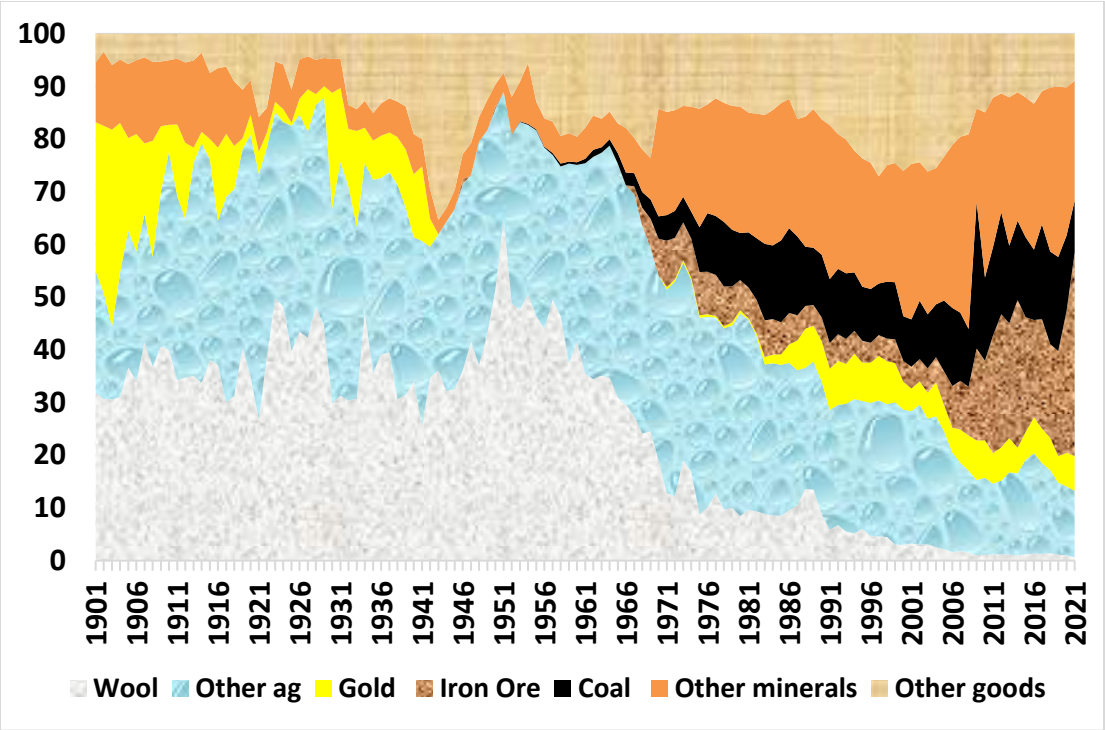

Source: Vamplew (1987).

Figure A4: Contributions of wool, gold and other goods to Australia's merchandise exports, 1840 to 2024 (%)

(a) 1840 to 1900



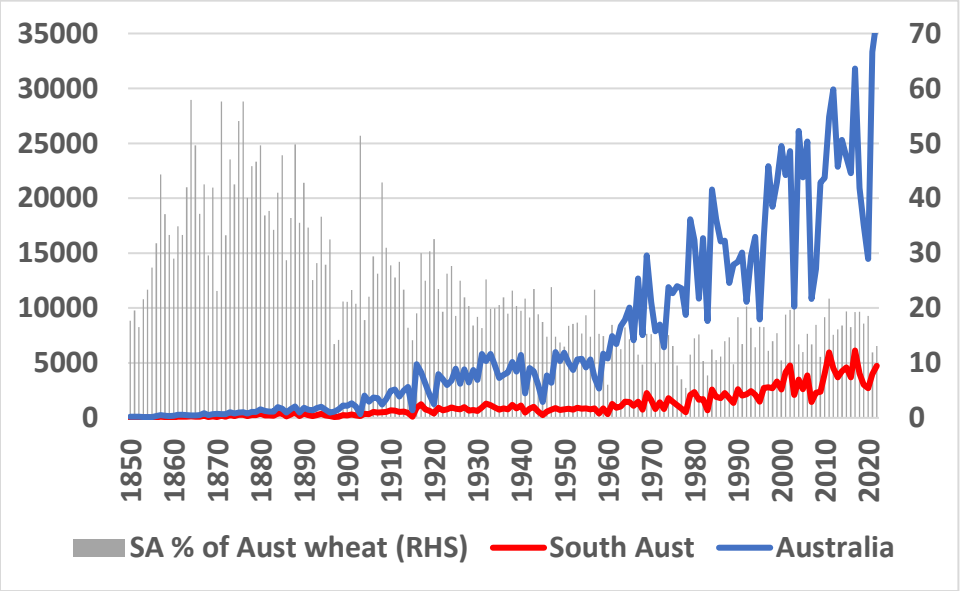

(b) 1901 to 2024



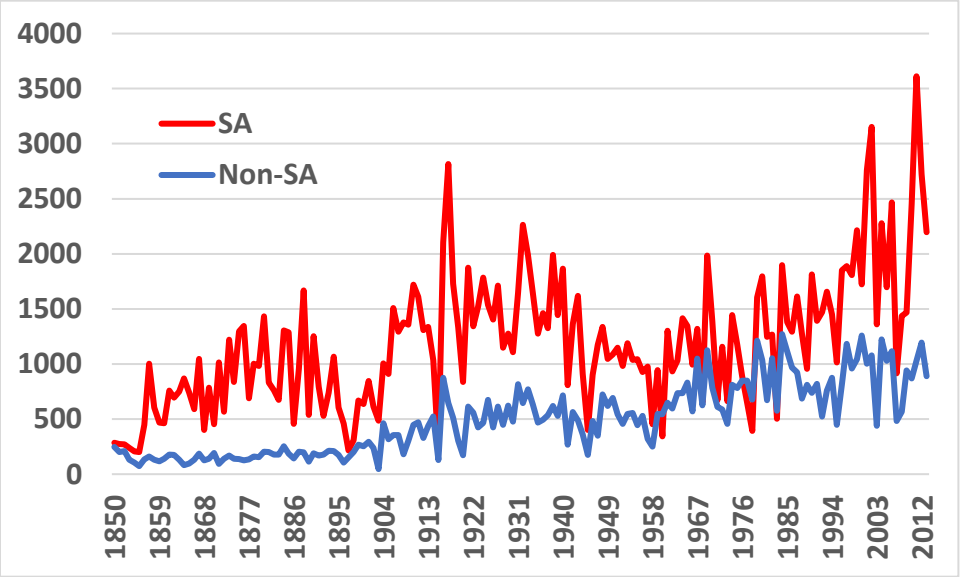

Sources: Vamplew (1987), updated from ABS and ABARES.

Figure A5: South Australia's and Australia's wheat, wool and barley production, 1850 to 2022

(a) Wheat production in SA and Australia and SA's share (kt and %)

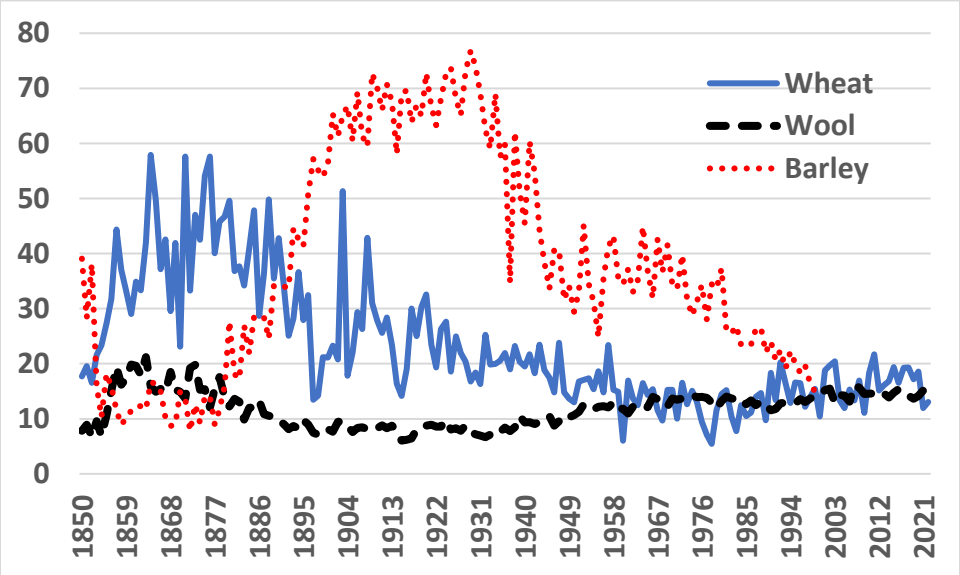



(b) Per capita wheat production, South Australia and rest of Australia (kgs)



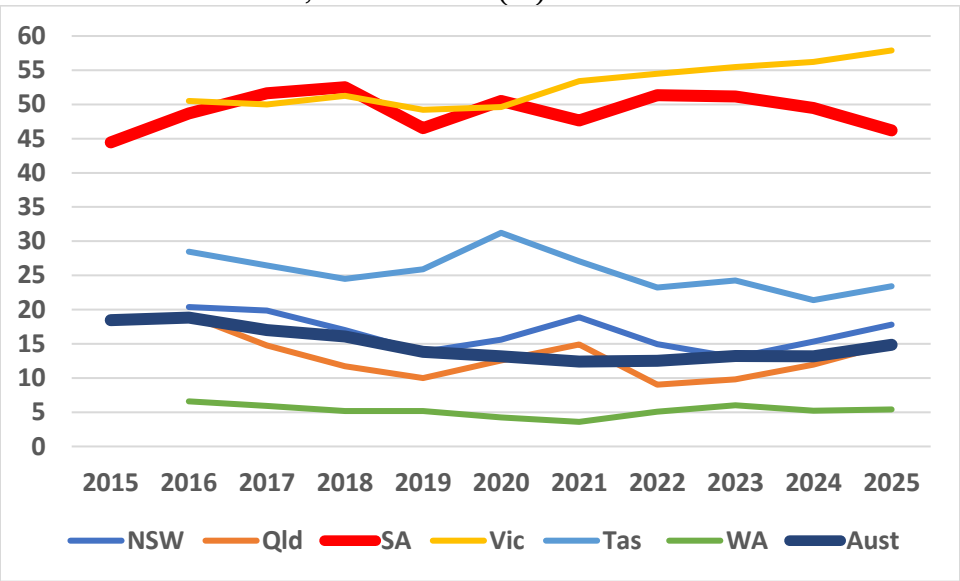

(continued)

Figure A5 (continued): South Australia's and Australia's wheat, wool and barley production, 1850 to 2022
(c) South Australia's share in Australia's wheat, wool and barley production (%)




Sources: South Australian *Statistical Registers* and ABS including its *Historical Selected Agricultural Commodities, by Australia, State and Territories, 1860 to 2022*.

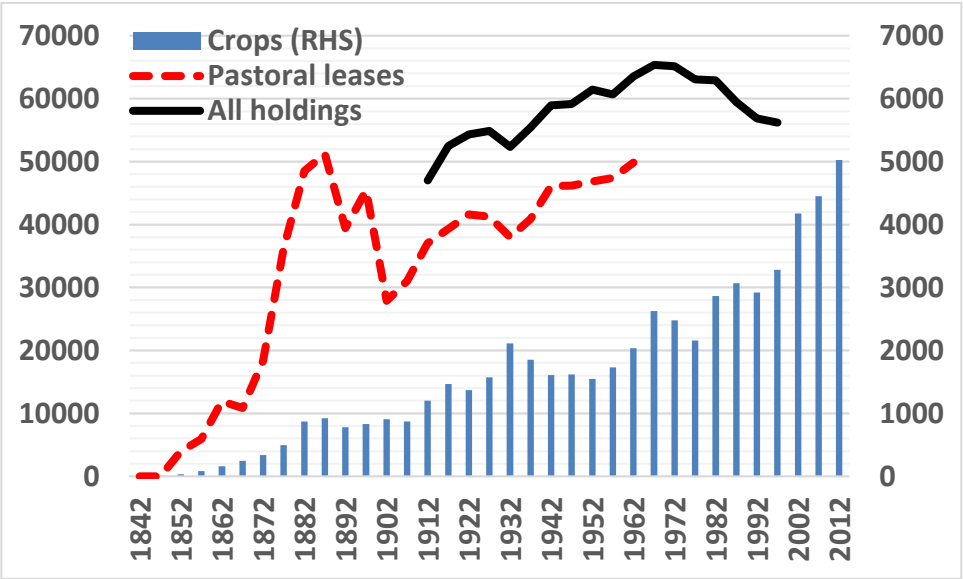
Figure A6: Agricultural shares of all goods' exports from South Australia and other states of Australia, 2016 to 2025 (%)



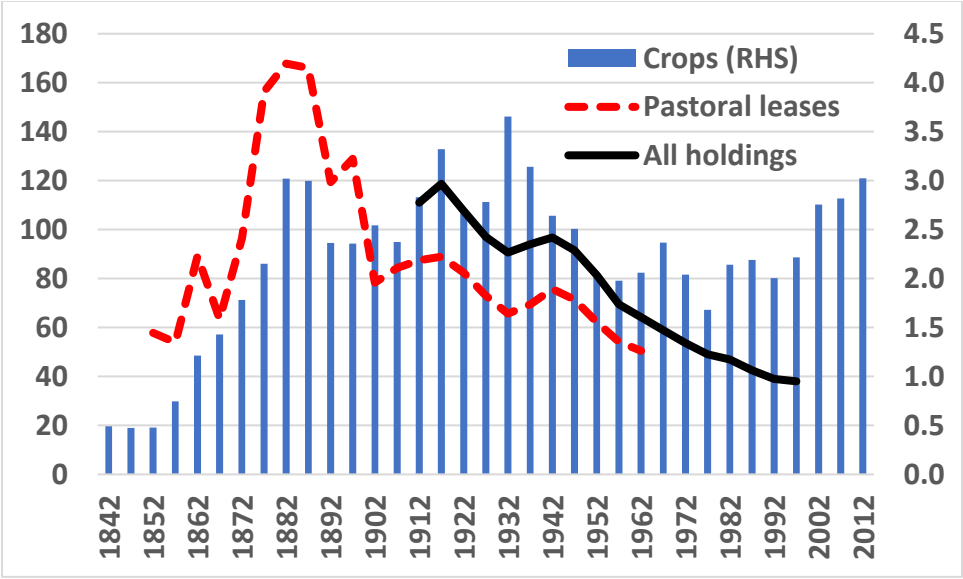

Source: DFAT for data from 2014-15 (see https://www.dfat.gov.au/trade/trade-and-investment-data-information-and-publications/trade-statistics/trade-statistical-pivot-tables).

Figure A7: Agricultural land area, South Australia and Australia, 1842 to 2013

(a) SA ('000 hectares)



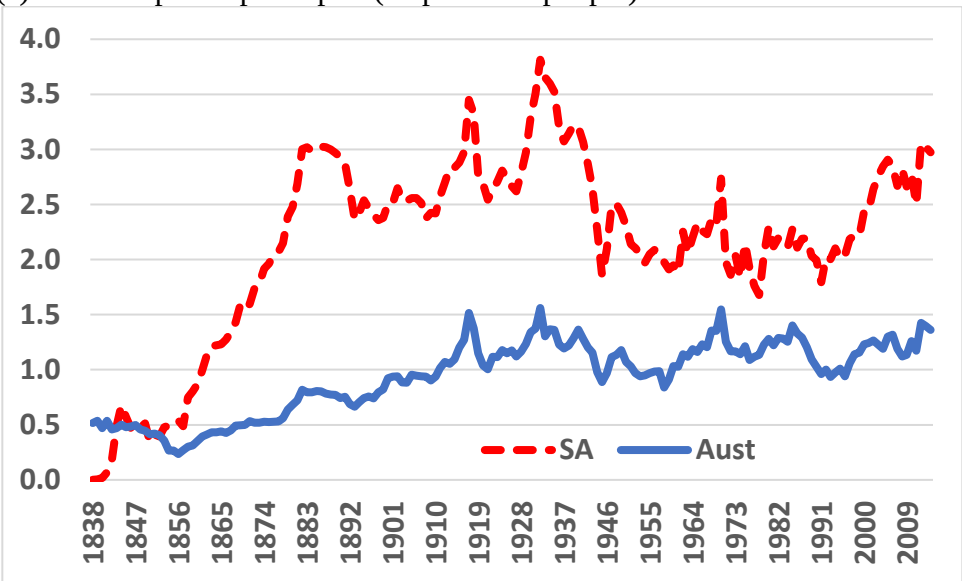

(b) SA (hectares per capita)



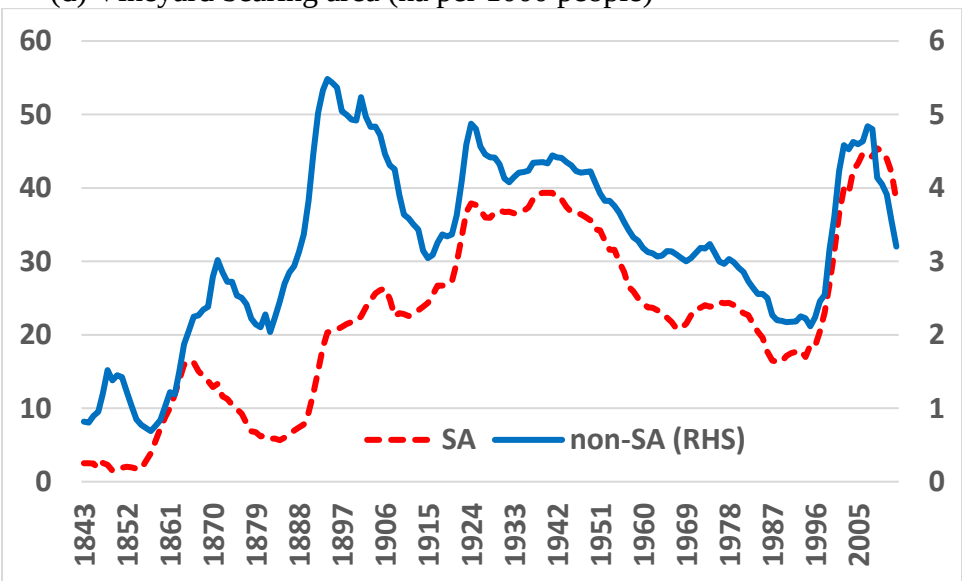

(continued)

Figure A7 (continued): Agricultural land area, South Australia and Australia, 1842 to 2013

(c) Total crop area per capita (ha per 1000 people)

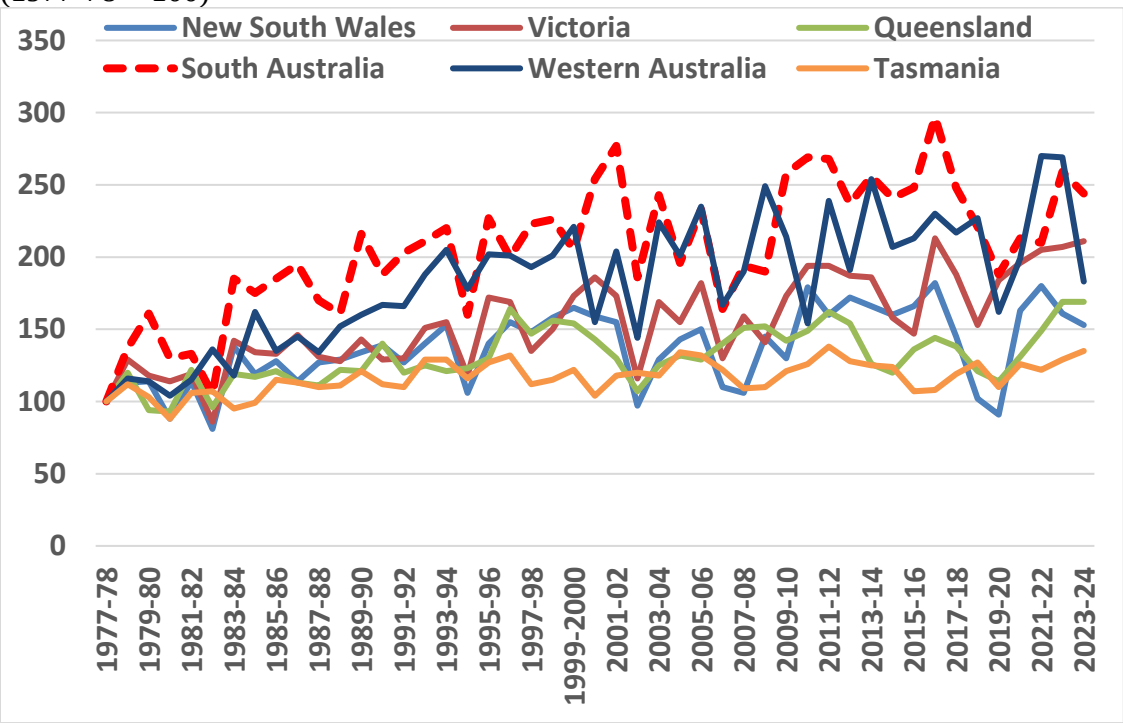



(d) Vineyard bearing area (ha per 1000 people)




Source: ABS and SA *Statistical Registers* and *Yearbooks*, and Anderson (2015).

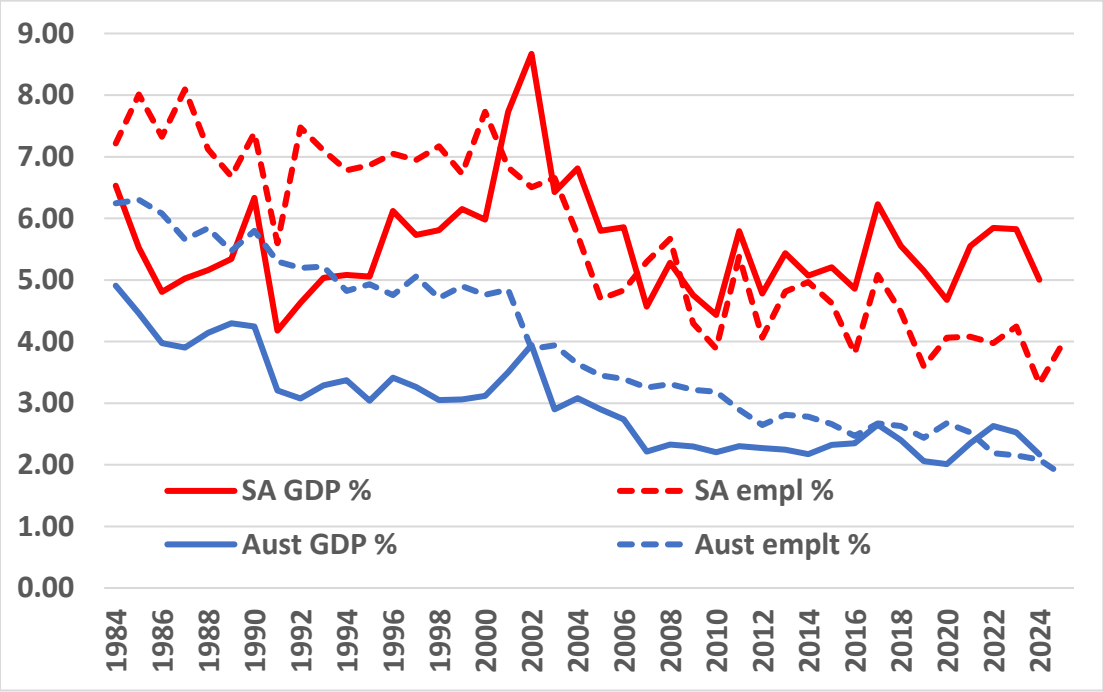
Figure A8: Broadacre farm productivity growth in Australia's states, 1978 to 2024 (1977-78 = 100)



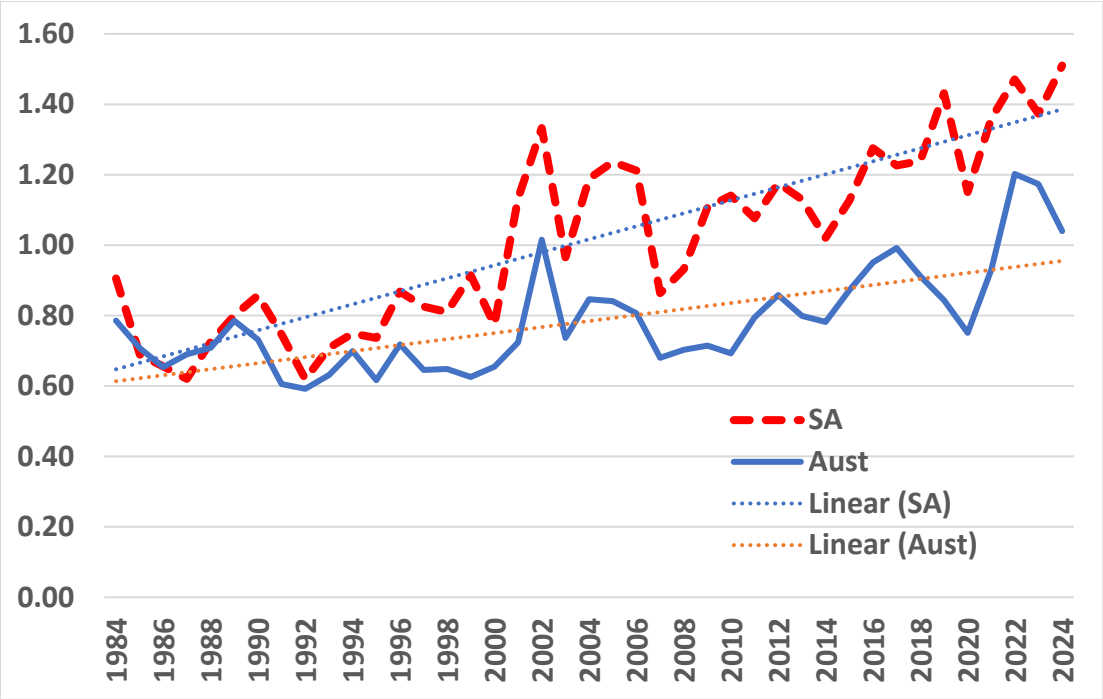

Source: ABARES (2026a), https://www.agriculture.gov.au/abares/research-topics/productivity/agricultural-productivity-estimates#download-data, accessed 13 February.

Figure A9: Agriculture's GDP and employment shares and labour productivity indexes, South Australia and Australia, 1984 to 2024

(a) Agriculture's GDP and employment shares (%)

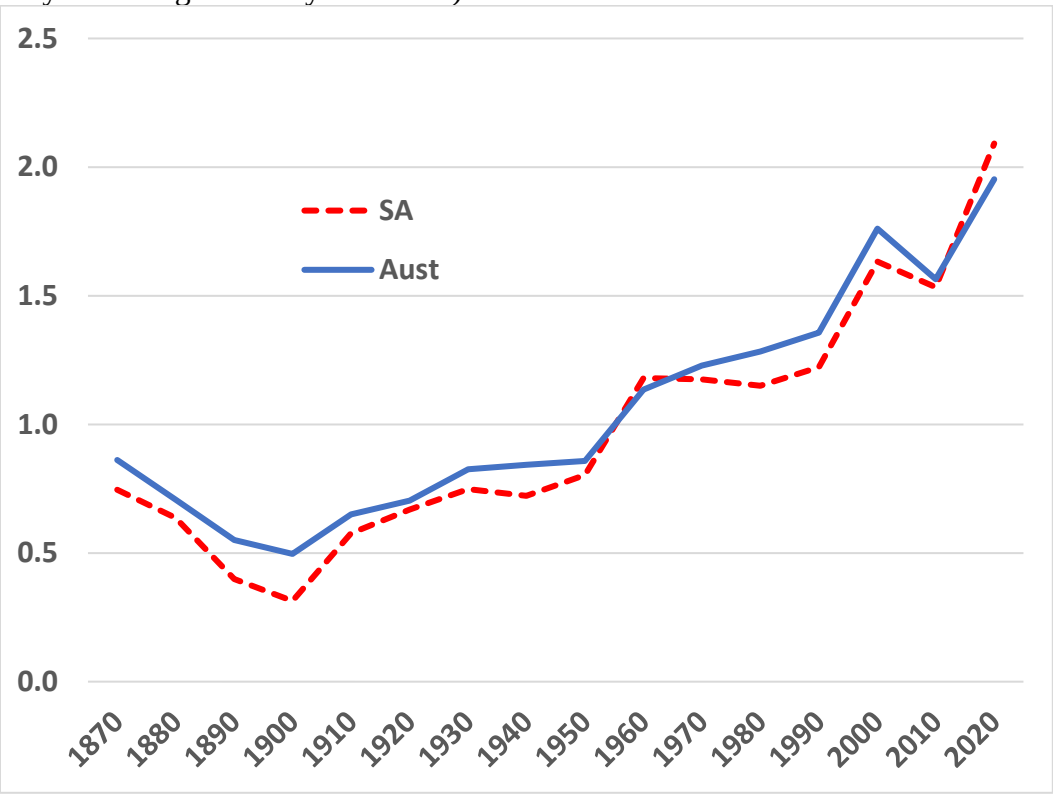



(b) Labour productivity index (ratio of GDP share to employment share)



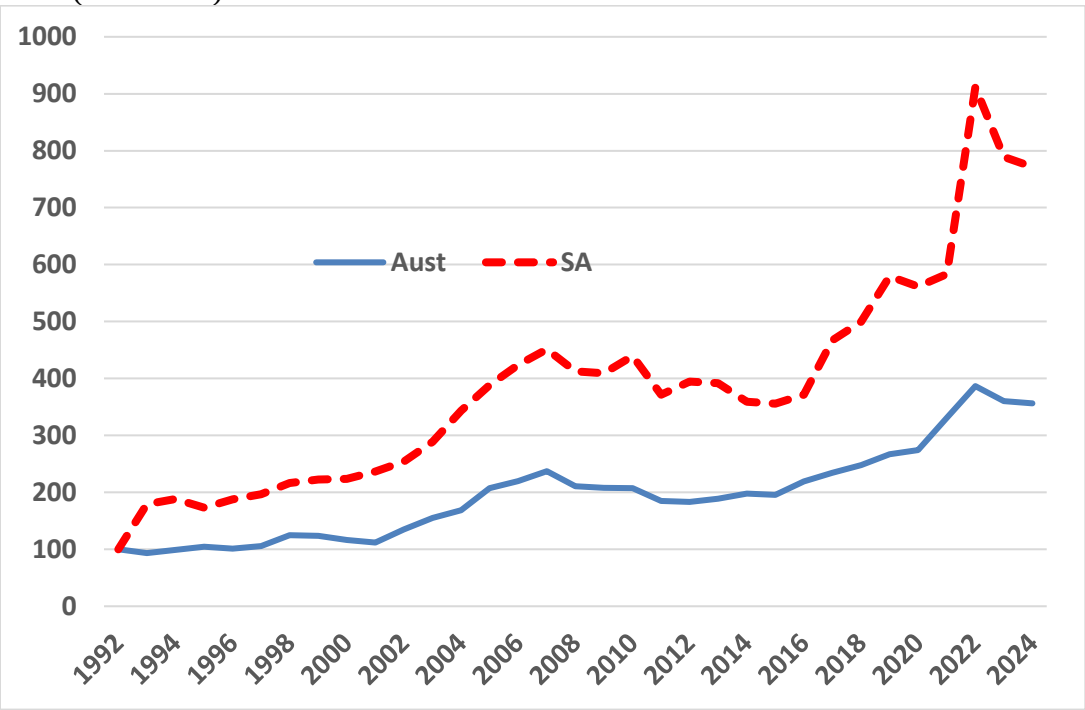

Sources: Figure A1 and ABS Cat No 6291.0.55.001 (Labour Force, Australia, Detailed)

Figure A10: Wheat yields, South Australia and Australia, 1860s to 2010s (t/ha, 10-year averages to the year shown)[a]




[a] The first two observations are an average of just the first, middle and last year of each of those decades.
Source: ABS (2024).

Figure A11: Broadacre farmland prices in South Australia and Australia, 1992 to 2024 (1992=100)[a]




[a] Corrected for inflation by use of the CPI.
Source: ABARES (2026b).