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ECONOMIC ASPECTS OF AUSTRALIAN FEDERATION: TRADE RESTRICTIVENESS AND WELFARE EFFECTS IN THE COLONIES AND THE COMMONWEALTH, 1901-3

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Economic Aspects of Australian Federation: Trade Restrictiveness and Welfare Effects in the Colonies and the Commonwealth, 1901-3

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Abstract

The federation of Australia in 1901 entailed the formation of a customs union among its six formerly tariff-autonomous colonies. Although the elimination of tariff barriers to intercolonial/interstate trade would have been welfare-enhancing, Australia's common external tariff was set considerably higher than the tariffs on external goods imported by the pre-federation colonies, implying a welfare reduction. Relying on a newly compiled dataset of 3,584 commodity- and colony-disaggregated imports, this paper estimates trade restrictiveness indices (TRIs) and static welfare losses for the six Australian colonies in 1900 and for the Commonwealth of Australia in 1903. This paper finds that the TRIs substantially exceeded average weighted tariffs in the colonies and in the Commonwealth. Moreover, this paper finds that, despite the high external tariff legislated by the newly formed Australian Commonwealth, the customs union produced an enormous net static welfare gain, estimated to have been 1.16 per cent of Australian GDP.

Key words: Australia, customs union, federation, tariffs, trade restrictiveness index

JEL codes: F13, F15, N77

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I. Introduction

When the Australian Commonwealth was founded in 1901, its main economic incarnation was a customs union among its six constituent states, formerly colonies. Prior to federation, the colonies possessed tariff autonomy and pursued quite divergent policies, ranging between a nearly free-trade policy in New South Wales and a markedly protectionist policy in Victoria. Within months of Australian federation, the first federal tariff went into effect in October 1901, coinciding with the abolition of tariffs on interstate trade.[1] As economic historians have observed, the first federal tariff (or common external tariff) closely resembled the Victorian tariff. Yet, even for Victoria, federation entailed a substantial break in trade policy; although Victoria's imports from outside of Australia were subject to similar tariffs as before federation, imports from the other Australian states became non-dutiable. As for New South Wales, the largest economy within the Commonwealth, the mostly non-dutiable importation of goods from outside of Australia ceased under federation, with these imports becoming subject to the common external tariff.

Economic historians have long considered the impact of the formation of the customs union on Australia's internal and external trade. As well, Lloyd (2015, p. 160) determined that Australia's average tariff on a basket of major goods imported from outside of Australia increased not insignificantly following federation. More precisely, Australia's common external tariff in 1903 exceeded an import-weighted average of the individual colonies' *tariffs on external (non-Australian) goods* in 1900. It would be expected that the heightened tariff on imports from outside

[1] However, there was one exception. Under the Australian Constitution, Western Australia was permitted to continue imposing duties on imports from other Australian states for a period of five years. The duties could not be raised above the level in effect when the customs union became operational. Furthermore, the maximum duty per commodity was progressively reduced by one-fifth of its initial level, each year, until all duties on imports from other states were phased out, after five years. See *Australian Constitution* s. 95.

of Australia would have reduced the Commonwealth's aggregate welfare. Indeed, several economic historians have speculated that federation was welfare-reducing. According to Forster (1977, p. 115), 'The 1901 tariff was likely to have reduced the Australian G.D.P. below what it would otherwise have been…the fact that New South Wales moved from complete free trade to protection, seems to raise the potential for loss'. In *Why Australia Prospered*, McLean (2013, pp. 136-7) wrote, 'There seems little doubt that the average *level* of protection increased for the country as a whole since bargaining between the states resulted in the uniform national tariff rates being set mainly in reference to those prevailing in Victoria. In theory, this would have a negative effect on national economic welfare' (emphasis in original). However, whilst it may be accepted that federation entailed a welfare-reducing increase in the tariff on Australia's external trade, federation also entailed a welfare-enhancing dismantlement of tariffs on interstate trade. In magnitude, how does the welfare loss from Australia's increased common external tariff compare to the welfare gain from internal trade liberalisation?

This paper has three aims. First, following the approach of Kee et al. (2008), trade restrictiveness indices (TRIs) are estimated for each of the six pre-federation colonies in 1900 and for the Australian Commonwealth in 1903.[2] The TRI is the uniform tariff rate such that, if it was applied to all imports, the welfare effect would be identical to the welfare effect produced by the existing tariff structure, in which varying tariffs are applied to (elasticity-varying) commodity imports. Second, the static deadweight welfare losses arising from tariff policy are estimated, as a per cent of GDP, for each of the six pre-federation colonies, for a composite pre-federation 'Australia', and for the post-federation Australian Commonwealth. It must be acknowledged that the estimated static welfare losses do not account for, *inter alia*, the possibility that Australian

[2] For the seminal study on the TRI, see Anderson and Neary (1994).

tariffs effected a terms of trade gain.[3] However, this possibility was a remote one. In 1903, Australia took approximately 1.5 per cent of world imports (Federico and Tena 2019). In 1900, it constituted a mere 0.7 per cent of world GDP (Bolt and van Zanden 2020). With regard to tariff theory, this paper concerns a classic 'small country' case. Third, this paper situates Australia's pre- and post-federation TRIs and static welfare losses within the contemporary international context.

For the first era of globalisation, TRIs and static welfare losses have been estimated for a couple of other countries. For the United States, Irwin (2010) produced an annual series of both measures for 1867-1961. For Canada, Beaulieu and Cherniwchan (2014) estimated these measures quinquennially for the period from 1870-1910. This paper contributes to the literature by estimating TRIs and static welfare losses for another 'western offshoot', Australia. In so doing, it raises the number of polities for which such measures are available (for c.1900) from two to nine, including the six Australian colonies and the Commonwealth. Broadly, this study enables a better understanding of the diversity of tariff policies and their attendant welfare effects in the high-income, settler economies of the first era of globalisation. Comparisons between Australian and Canadian trade policy, in particular, have featured in previous literature, with Pomfret (2000) observing a divergence in their policies throughout the twentieth century. To what extent were the trade policies of these Dominions similarly restrictive and welfare-reducing at the start of the twentieth century?

The next section of this paper describes the tariff policies of the colonies, on the eve of federation (1900), and the Commonwealth, shortly after the formation of the customs union (1903). It also covers the widening scholarship on the economic consequences of Australia's tariff

[3] With regard to federation, Forster (1977, p. 115) suggested that 'for Australia dynamic effects in the short run were probably unimportant'.

policy pre- and post-federation. The section thereafter describes the historical (and modern) data used in estimating the TRIs and static welfare losses. Far from conforming to an internationally standardised classification system, the colonies' classifications of commodity imports did not even align with each other. One of the main tasks of this study is to categorise the colonies' commodity imports according to modern industry classifications, for the purpose of matching imports to elasticities. An incidental benefit of this study is the availability of consistent, industry-disaggregated import values and tariffs for each of the six colonies and the Commonwealth. In the penultimate section of the paper, the TRIs and welfare losses are estimated and discussed. Concluding comments are offered in the final section.

II. Tariffs Before and After Federation

On the eve of federation, there was considerable variation in the trade policies of the colonies, as borne out by their average tariffs in 1900. The average tariff of protectionist Victoria (11.8 per cent), which imposed tariffs on both manufactured and non-manufactured imports, was nearly double the average tariff of New South Wales (6.2 per cent), which derived its non-negligible customs revenue entirely from fiscally-motivated duties on alcohol, sugar, and tobacco (Lloyd 2017, p. 342). Thus, the two largest colonial economies, viz. New South Wales (37.4 per cent of Australian GDP) and Victoria (27.8 per cent), entered the Commonwealth with quite discrepant trade policies.[4] Given the strength of its association with protectionism, it might be expected that Victoria had the highest average tariff of all of the colonies in the late nineteenth century, but that was not the case. In 1900, Victoria's average tariff was surpassed by the average tariffs of Western Australia (16.0 per cent), Queensland (20.4 per cent), and Tasmania (22.4 per cent), partly due to

[4] These shares are calculated from the Sinclair (2009) dataset.

these colonies' greater reliance on the tariff as a source of public revenue (Lloyd 2017, pp. 331 and 342).[5] South Australia's average tariff was 8.1 per cent (Lloyd 2017, p. 342). A mild degree of protectionism—protectionist and fiscal motivations for tariffs are often difficult to distinguish from each other—permeated the trade policies of the four (economically) smaller colonies, all of which imposed tariffs on at least some non-luxury manufactures (Patterson 1968, pp. 158-63). For the purpose of estimating the TRIs and welfare effects, tariffs need not be dichotomised as either protective or fiscal, as both types of tariffs produce deadweight welfare losses. Still, a protectionist trade policy would target different commodity imports than would a revenue-orientated trade policy. Insofar as the price elasticities of import demand vary across commodities, the estimated welfare effects would be expected to differ between a mainly protective and a mainly fiscally-motivated trade policy.

Although the impact of tariffs on the welfare of the colonies has not been studied until now, a number of articles have evaluated other potential consequences of tariffs during Australia's colonial period. Some economic historians have argued that increases in Victoria's tariffs raised employment in manufacturing in the late nineteenth century (Sinclair 1955; Sinclair 1971; Haig 1989).[6] However, to whatever extent such a sectoral adjustment may have occurred, it was unlikely to have been growth-enhancing for pre-federation Australia, where agricultural labour productivity exceeded manufacturing labour productivity.[7] Analysing the cross-colonial and inter-temporal

[5] As Lloyd (2017, p. 331) goes on to mention, the smaller colonies had much smaller shares of land sales and excise taxes in public revenue, compared to New South Wales and Victoria.

[6] What effect Victoria's protectionist policy had on its sectoral composition is not readily apparent. In 1901, despite their divergent trade policies, the shares of manufacturing in total employment were not especially different between Victoria (20.3%) and New South Wales (17.5%); see Haig (1989, p. 3).

[7] In 1890/1, labour productivity in Australian agriculture was almost one-third higher than in manufacturing, as calculated from Butlin (1962, p. 460) and Butlin and Dowie (1969, p. 153).

variation in Australian tariffs from 1866-1900, Varian (2022) found no association between tariffs and growth in GDP per capita.[8] It is worth observing that, in 1900, GDP per capita was nearly identical in New South Wales and Victoria, despite their differing policies (Sinclair 2009).

In crafting the first federal tariff of 1901, both fiscal and protective considerations were weighed (Forster 1977, p. 99). The federal tariff needed to generate a customs revenue adequate to finance the new Commonwealth government. Under the controversial Braddon Clause of the Australian Constitution, up to one-quarter of customs revenue could be retained by the Commonwealth government, with the remainder remitted to the states (*Australian Constitution*, s. 87).[9] In the first year of the federal tariff, only 83 per cent of customs revenue was remitted (Forster 1977, p. 99). The reliance of the Commonwealth and state governments on customs revenue, as well as the cessation of customs revenue derived from interstate trade, all conspired toward a federal tariff with high duties on imports into the customs union. As well, a high external tariff aligned with the aims of protectionist legislators, who ultimately achieved a federal tariff that emulated the Victorian tariff.

In applying tariffs, the pre-federation colonies did not differentiate between imports from other Australian colonies and imports from outside of Australia. In fact, one of the few restrictions which Britain had placed on the self-governing colonies' tariff-autonomy, since the 1850s, was that the colonies could not set preferential tariff rates, even for imports from Britain (Patterson 1968, p. xiv).[10] Thus, it would be misleading to describe a 'colonial external tariff'. Still, for each

[8] Furthermore, there was no statistically significant correlation between growth and a proxy for the tariff on, specifically, manufactured imports.

[9] The operation of the Braddon Clause was limited, in its duration, to ten years. The procedure for apportioning the federal customs revenue among the states was set out in a separate section; see *Australian Constitution*, s. 93.

[10] Although, by the time of Australian federation, the restriction against preferential trade policies within the British Empire had been strained, as evidenced by Canada's adoption of

colony, there were stark compositional differences between imports from other Australian colonies and imports from outside of Australia. Due to cross-commodity variation in tariff rates, the average *tariff on internal (Australian) goods* would differ from the average *tariff on external (non-Australian) goods*. For a basket of 31 major commodities imported by post-federation Australia, Lloyd (2015, pp. 157-60) calculated the commodity-weighted average tariff on external goods for each of the six colonies in 1900 and for the Commonwealth in 1903.[11] Of course, for the Commonwealth, the tariff on external goods approximates the common external tariff. Consistent with what had been suggested in the traditional literature, Australia's tariff on external goods increased under federation. The weighted average of the six colonies' average tariffs on external goods was 10.8 per cent in 1900, compared to the Commonwealth's average tariff on external goods of 13.5 per cent in 1903 (Lloyd 2015, p. 160).[12] The increase in the tariff on external goods would not necessarily imply a welfare loss for Australia, since the tariff structure could have shifted toward higher tariffs on relatively less elastic imports. However, assuming no such change in the tariff structure, the increase in the tariff on external goods would have been welfare-reducing. The main question, addressed in this paper, is whether the welfare reduction was of greater or lesser magnitude than the welfare enhancement from internal trade liberalisation.

The influence of federation on the pattern of trade, both among the Australian states and between the Australian states and other countries, has received some attention in the literature.

imperial preference in 1897; see Shields (1965). As well, in 1895, South Australia did reach a preferential agreement, covering a small number of commodities, with New Zealand; see New Zealand, Customs Duties Reciprocity Act, 1895, 59 Vict., no. 74.

[11] The 31 major commodities were those for which Australia's average annual import value exceeded £200,000 from 1899-1903, and which could be matched to corresponding commodities or groups of commodities in the colonial trade statistics; see Lloyd (2006, p. 171).

[12] If only the 23 dutiable commodities are included in the basket, then the increase in the average tariff is even greater, from 13.1% to 17.5%.

Coleman (2018) constructed a matrix of the pre-/post-federation changes in the propensities of each state both to export to and to import from the (five) other Australian states and the rest of the world.[13] All states but Victoria realised a decline in their propensities to import from the rest of the world.[14] With respect to intra-Australian trade, there was substantial heterogeneity among the states. Victoria was the only state to realise increased propensities *both* to export to and to import from the other states. Although the propensity of New South Wales to export to the other Australian states increased, its propensity to import from them declined. Overall, the formation of the Australian customs union did not uniformly internalise the trade of all states, i.e. reduce their propensity to trade with the rest of the world and increase their propensity to trade with the other states within the union. Irwin (2006) argued that federation had little effect on the pattern of Australian trade. A comparison of cross-sectional gravity-model estimates for 1900 and 1906, in which each Australian state is treated as though it was a country, reveals that the border effect actually declined slightly following federation, contrary to what would be expected with the formation of a customs union. Remarkably, even in 1900, when there were (non-preferential) tariffs on intra-Australian trade, intra-Australian trade was many times greater than Australia's trade with other countries, *controlling* for both distance and GDP. Thus, even before there was an Australian political border, there was a substantial Australian border effect.[15]

[13] To give an example, the propensity of New South Wales to export to Tasmania is the geometric mean of the propensity of New South Wales to export to Tasmania, i.e. the share of exports to Tasmania in the GDP of New South Wales, and the propensity of Tasmania to import from New South Wales, i.e. the share of imports from New South Wales in the GDP of Tasmania.

[14] It is suggested that the increase in Victoria's propensity to import from the rest of the world is an income effect, whereby federation raised Victorian income and its demand for goods only produced outside of Australia; see Coleman (2018, p. 244).

[15] In 1900, the estimated border effect was such that Australia's intranational trade was 4.7 times greater than its international trade, *ceteris paribus*; see Irwin (2006, p. 323).

III. Data

The TRI and static deadweight welfare losses are estimated for each of the Australian colonies for 1900, i.e. the final year before federation, and for the Commonwealth in 1903. Like Lloyd (2015), this paper selects 1903 as the post-federation year, because the first federal tariff, which went into effect in October 1901, underwent several amendments throughout 1902 (Forster 1977, p. 100). Four types of data are required for the analysis: current GDP and industry-specific import values, tariff rates, and import price elasticities of demand. The current GDPs of the colonies and the Commonwealth are obtained from Sinclair's (2009) historical national accounts for Australia.

For this paper, a dataset of commodity-specific import values is created from the official statistical volumes of the colonies and the Commonwealth.[16] The classifications of commodity imports differed quite significantly across the colonies, with some colonies using more disaggregated classifications. In 1900, Victoria enumerated nearly twice as many commodities (656) as did Tasmania (336). Altogether, the dataset covers 3,585 commodity-specific, colony-/Commonwealth-specific import values.[17] The import values pertain to total imports, as opposed to imports for just domestic consumption, and therefore include the values of those goods transiting through a colony. The sole exception is Victoria, which (only) reported the values of commodity imports exclusive of transshipments. For the other five colonies, the use of total import values is unavoidable. New South Wales did not distinguish between total imports and imports for domestic

[16] These volumes are: *Annual statement of the trade of the Commonwealth of Australia with the United Kingdom, British possessions, and foreign countries for the year 1903*; *Statistical register for 1900 and previous years* (New South Wales); *Statistics of the colony of Queensland for the year 1900*; *Statistical register. 1900* (South Australia); *Statistics of the colony of Tasmania for the year 1900*; *Statistical register of the colony of Victoria for the year 1900*; and *Statistical register of the colony of Western Australia for 1900 and previous years*.

[17] Excluded from the dataset are imports of gold, silver, and copper coin, as well as gold and silver bullion, ingots, and similarly described commodities.

consumption—unsurprising, given that nearly all of its commodity imports were non-dutiable. The other four colonies reported imports for domestic consumption only for dutiable commodities, and, even then, reported just the quantity of imports for domestic consumption if the duty was applied on a specific rather than *ad valorem* basis.

The dataset also includes commodity-specific tariff rates, of which there are three categories: non-dutiable, *ad valorem*, and specific. For the analysis, all tariff rates must be expressed as *ad valorem* rates. For non-dutiable commodities, the tariff rate is recorded as 0 per cent. For those commodities subject to *ad valorem* duties, the tariff rate is recorded as the *ad valorem* rate reported in the official statistics. For those commodities subject to specific duties, an *ad valorem* equivalent rate is calculated as the specific duty divided by the average unit value, which is itself calculated by dividing the total value of imports by the total quantity of imports.[18] Table 1 presents the distribution of tariff rates, both by the number of commodities and by value, for each of the colonies and for the Commonwealth. The distributions differed among the colonies, especially with respect to the proportion of non-dutiable imports. It is noteworthy that, apart from New South Wales, the colony with the highest share of non-dutiable imports, by value, was actually Victoria. Many of Victoria's non-dutiable imports were material inputs in manufacturing, and the free admission of these commodities furthered the colony's protectionist policy, raising the effective tariff rates for finished manufactures (Lloyd 2017, pp. 324-5).

The fourth type of data required for the analysis are import price elasticities of demand. Due to the incongruity between the colonial trade statistics and modern Harmonized System (HS)

[18] Although customs revenue is reported in the colonial trade statistics, the *ad valorem* equivalent tariff rate is not calculated by dividing customs revenue by the value of total imports, because duties were only levied on imports for direct consumption, the value of which is not typically reported in the case of specific duties. To the extent that total imports and imports for direction consumption differ, the *ad valorem* equivalent tariff rate would be mismeasured.

of classification, it is infeasible to match the nineteenth-century commodities to modern elasticities estimated for HS commodities at finer levels of disaggregation, e.g. HS4 or HS6. Therefore, this paper emulates Irwin (2010) in estimating the TRIs and welfare losses using industry-specific rather than commodity-specific import values, tariff rates, and elasticities. Import values are aggregated to the industry level, and industry-specific tariff rates are calculated as an import-weighted average of the commodity-specific tariff rates within each industry. For the purpose of matching imports and tariffs to elasticities, each of the commodities is assigned to one of the 21 industries for which Fontagné et al. (2022, p. 12) have estimated import price elasticities of demand from variation in tariff rates from 2001-16. Each of these 21 industries encompasses one or more HS2 industries. Indeed, the fact that these elasticities are tariff-based enhances their appropriateness for this analysis, since the pass-through of tariffs to prices is not always complete. In an effort to ensure the robustness of the results, the elasticities used by Irwin (2010, p. 115) in estimating the TRIs and welfare losses for the United States are used here as alternative elasticities. For 14 industries, which do not align with the industries in Fontagné et al. (2022), Irwin (2010) used elasticities estimated by Stern et al. (1976) and Shiells et al. (1986). Thus, each of the commodities in the dataset is also assigned to one of these 14 industries. To be clear, each commodity in the dataset is categorised according to two different classifications of industries. Hereafter, the 21 industry-specific elasticities from Fontagné et al. (2022) are described as the *Main* elasticities. The 14 industry-specific elasticities from Stern et al. (1976) are referred to as the *Alternative I* elasticities, while the elasticities for the same 14 industries from Shiells et al. (1986) are referred to as the *Alternative II* elasticities. Appendix A reports all three sets of elasticities.

Assigning nineteenth-century commodities to modern industries is an ambiguous endeavour. For example, the Tasmanian official statistics enumerate the commodity 'Furniture:

Cabinet Makers' and Upholsterers' Materials'. Should this commodity be assigned to the industry of 'Textile and Textile Articles' (which includes upholstery fabric), 'Base Metals and Articles of Base Metal' (which includes tools and implements), or 'Miscellaneous' (which includes furniture)? Commodity classifications such as 'Stationery', which combine goods from different industries are particularly problematic. Due to these ambiguities, the categorisation of commodities is, admittedly, imprecise. However, the use of two different sets of industry classifications should go some way toward ensuring that the overall findings are not dependent upon the imprecise assignment of commodities to industries.

Appendix B reports the industry-specific import values and tariff rates according to both the 21-industry classification and the 14-industry classification, for each of the six colonies and for the Commonwealth. As might be expected, the industries of 'Base Metals and Articles of Base Metals' and 'Textile and Textile Articles' accounted for relatively large shares of imports, but even these shares differed substantially across colonies. To give an example, 'Textile and Textile Articles' comprised 34.9 per cent of the imports of Victoria, but merely 13.4 per cent of the imports of Western Australia. The composition of imports varied across the colonies to no small extent, as did the tariff rates.

IV. Analysis

Following Kee et al. (2009, p. 179), the TRI is estimated as:

$$TRI = \sqrt{\frac{\sum_n m_n \varepsilon_n \tau_n^2}{\sum_n m_n \varepsilon_n}} \qquad (1)$$

In Equation 1, *m* stands for the share of imports in GDP, ε for the price elasticity of import demand, and τ for the *ad valorem* equivalent tariff rate. The subscript *n* denotes the industry, of which there are 21 for the *Main* estimates and 14 for the *Alternative* estimates. The TRIs for each of the

colonies in 1900 and for the Commonwealth in 1903 are reported in Table 2. Regardless of the choice of elasticities, the TRIs exceed the average tariffs for the colonies, although the rank order of the colonies remains mostly intact. For the Commonwealth, the TRI is similar when estimated using the *Main* elasticities (28.7 per cent) and the *Alternative I* elasticities (27.5 per cent), and is quite close to the TRI for Britain's other large Dominion, Canada, for which Beaulieu and Cherniwchan (2014, p. 157) have estimated a TRI of 25.2 per cent for 1900.

The static deadweight welfare loss, as a share of GDP, is estimated using the following equation (Johnson 1960):

$$WELFARE\ LOSS = 0.5 \sum_n m_n \varepsilon_n \tau_n^2 \qquad (2)$$

The variables and subscripts retain their meanings from Equation 1. The welfare losses are reported in Table 2. Welfare losses, as a per cent of GDP, were least for New South Wales and greatest for Queensland. Despite its association with protectionism, the static welfare losses from the trade policy of Victoria were less than the welfare losses from the trade policies of Queensland and Tasmania.

Most crucial is the comparison of the tariff-induced welfare losses in pre-federation Australia and in the Commonwealth. For the former, the welfare loss is calculated as a GDP-weighted average of the welfare losses in each of the colonies. Indeed, federation produced a net welfare gain for Australia, with the welfare loss declining by 1.16 percentage points (*Main*), 0.59 percentage points (*Alternative I*), or 1.50 percentage points (*Alternative II*). The choice of elasticities does not alter the finding that federation was beneficial to Australian welfare. The magnitude of the welfare gain arising from the Australian customs union far exceeded the magnitudes of the welfare effects of other developments in the nineteenth-century trade policy. It has been estimated that the watershed event in Canadian trade policy, the adoption of the 'National

Policy' in 1879, resulted in a further static welfare loss of 0.22 percentage points, as gauged from the 1875 and 1880 estimates (Beaulieu and Cherniwchan 2014, p. 157). In the United States, one of the sharpest movements in the static welfare loss as a share of GDP occurred under the trade-liberalising Wilson Gorman Tariff of 1894, with the welfare loss declining by 0.49 percentage points, from 1.00 per cent of GDP in 1893 to 0.51 per cent of GDP in 1895 (Irwin 2010, p. 130).[19]

As for the literature on the economics of customs union *formation*, the European Economic Community (EEC) has received the most scholarly attention.[20] Surveying the literature, Eichengreen and Boltho (2010, p. 282) suggest that the long-run effect of EEC membership, for its original six members, was an increase in GDP of roughly 5 per cent. A rather more tenuous contrast is between the Australian customs union and the North American Free Trade Agreement (NAFTA). Without a common external tariff, NAFTA is not a customs union but a free trade area. Moreover, the welfare effects have not been estimated using a method similar to the one employed in this study. Still, it is worth contrasting the substantial welfare effect of the Australian customs union with the meagre long-run effects of NAFTA, which raised American welfare by 0.01 per cent, was neutral for Canada, and reduced Mexican welfare by 0.30 per cent (Romalis 2007, p. 429).

This paper finds that the formation of the Australian customs union, although it entailed an increased tariff on external goods, was nonetheless welfare-enhancing. In magnitude, the welfare loss from the higher tariff on external goods was outweighed by the welfare gain from internal trade liberalisation. However, the net welfare gains from federation should not be misinterpreted

[19] It would appear that the effects of the protectionist McKinley Tariff of 1890 and Dingley Tariff of 1897 were of lesser magnitude.

[20] As well, several studies have examined economic aspects of the formation of the German Zollverein, a prototype for modern customs unions. For example, Ploeckl (2015) modelled the decision of states to join the German Zollverein.

as resulting in a country comparatively unaffected by trade policy. The static deadweight welfare loss in the Australian Commonwealth in 1903, estimated to be as much as 5.56 per cent of GDP using the *Main* elasticities, still far exceeded the welfare loss in Canada (1.24 per cent of GDP) and the United States (0.56 per cent) in 1900 (Beaulieu and Cherniwchan 2014, p. 157; Irwin 2010, p. 130). Among the Western offshoots, Australia had a comparatively welfare-adverse trade policy, even though federation brought a net improvement.

V. Conclusion

This paper has estimated that the formation of the Australian customs union in 1901 resulted in a substantial net aggregate welfare gain of 1.16 per cent of Australian GDP. Even the most conservative estimate, obtained using a different set of import elasticities, is that the gain exceeded one-half of one per cent of GDP. However, it is important to emphasise that this is an aggregate welfare gain, i.e. for the entire Commonwealth. Almost certainly, federation would have been welfare-reducing for the formerly free-trading, largest colonial economy of New South Wales, as Forster (1977, p. 115) suggested. Collectively, the welfare gains of the other five states would have been greater than suggested by the Commonwealth aggregate estimate.

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Table 1. Distribution of tariff rates, 1900-3

Colony	Year	Free	Dutiable			
			Less than 10 per cent	10-19.9 per cent	20-29.9 per cent	30 per cent or greater
By Number of Commodities						
New South Wales	1900	92.2	0.4	2.2	1.2	3.9
Queensland	1900	39.0	3.0	13.2	28.9	15.9
South Australia	1900	33.7	2.9	17.8	21.5	24.1
Tasmania	1900	47.5	1.2	13.4	17.8	20.2
Victoria	1900	42.4	3.8	12.3	17.5	23.9
Western Australia	1900	29.9	13.1	32.3	13.9	10.8
Australian Commonwealth	1903	39.7	3.6	21.4	19.7	15.7
By Value						
New South Wales	1900	88.4	0.0	3.5	3.9	4.3
Queensland	1900	34.3	7.5	19.4	20.7	18.0
South Australia	1900	46.9	3.8	20.2	19.4	9.7
Tasmania	1900	21.8	0.7	17.9	44.2	15.4
Victoria	1900	59.5	2.8	11.4	9.5	16.8
Western Australia	1900	34.7	15.0	34.6	6.1	9.5
Australian Commonwealth	1903	28.8	9.3	23.7	26.9	11.3

Sources: Calculated from dataset compiled from *Annual statement of the trade of the Commonwealth of Australia with the United Kingdom, British possessions, and foreign countries for the year 1903*; *Statistical register for 1900 and previous years* (New South Wales); *Statistics of the colony of Queensland for the year 1900*; *Statistical register. 1900* (South Australia); *Statistics of the colony of Tasmania for the year 1900*; *Statistical register of the colony of Victoria for the year 1900*; and *Statistical register of the colony of Western Australia for 1900 and previous years*.

Table 2. Average weighted tariff, TRI, and deadweight welfare loss, 1900-3

Colony	Year	Average weighted tariff	TRI	GDP (£ million)	Static deadweight welfare loss (per cent of GDP)
Main estimates					
New South Wales	1900	6.2	20.1	74.2	4.6
Queensland	1900	20.4	33.6	24.9	11.8
South Australia	1900	8.1	21.5	17.0	6.4
Tasmania	1900	22.6	25.1	9.2	8.5
Victoria	1900	11.8	31.3	56.6	7.4
Western Australia	1900	16.0	22.3	19.8	6.0
Pre-federation Australia	1900	--	--	201.7	6.7
Australian Commonwealth	1903	21.1	28.7	208.2	5.6
Alternative I estimates					
New South Wales	1900	6.2	21.9	74.2	1.6
Queensland	1900	20.4	34.4	24.9	3.3
South Australia	1900	8.1	24.3	17.0	2.0
Tasmania	1900	22.6	31.2	9.2	2.3
Victoria	1900	11.8	23.5	56.6	1.8
Western Australia	1900	16.0	27.2	19.8	2.1
Pre-federation Australia	1900	--	--	201.7	2.0
Australian Commonwealth	1903	21.1	27.5	208.2	1.4
Alternative II estimates					
New South Wales	1900	6.2	37.0	74.2	3.7
Queensland	1900	20.4	53.9	24.9	7.1
South Australia	1900	8.1	37.4	17.0	4.3
Tasmania	1900	22.6	50.1	9.2	5.4
Victoria	1900	11.8	42.2	56.6	4.3
Western Australia	1900	16.0	40.5	19.8	4.5
Pre-federation Australia	1900	--	--	201.7	4.5
Australian Commonwealth	1903	21.1	43.1	208.2	3.0

Sources: Average weighted tariff for colonies: Lloyd (2017, p. 342); average weighted tariff for the Australian Commonwealth: Lloyd (2008, p. 123); TRI: see text; GDP: Sinclair (2009); static deadweight welfare loss: see text.

Appendix A

Industry import price elasticities

	Main
Main	
Live Animals and Animal Products	-7.54
Vegetable Products	-6.06
Animal or Vegetable Fats and Oils	-8.53
Prepared Foodstuffs, Beverages, and Tobacco	-6.17
Mineral Products	-18.5
Products of Chemical Industries	-10.33
Plastic and Articles thereof	-8.39
Raw Hides and Skins, Leather and Articles Thereof	-5.59
Wood/Cork and Articles of Wood/Cork	-8.47
Pulp of Wood or other Cellulosic Materials	-9.93
Textile and Textile Articles	-7.15
Footwear, Headgear, Umbrellas and Prepared Feathers	-3.61
Articles of Stone, Plaster, Ceramic, and Glass	-6.62
Natural Cultured Pearls and Precious Stones and Metals	-13.59
Base Metals and Articles of Base Metals	-9.59
Machinery, Mechanical Appliances, and Electrical Machinery	-6.08
Vehicles, Aircraft, and Transport Equipment	-10.46
Optical, Photographic, Precision and Medical Instruments	-5.61
Arms and Ammunitions	-6.52
Miscellaneous	-4.85
Works of Art	-5.96

	Alternative I	*Alternative II*
Alternative		
Chemicals, Oils, Paints	-2.53	-7.18
Earthenware and Glassware	-2.85	-2.12
Metals and Manufactures	-1.68	-1.51
Wood and Manufactures	-1.40	-5.44
Sugar, Molasses, and Manufactures	-0.66	-0.66
Tobacco and Manufactures	-1.13	-7.57
Agricultural Products	-1.13	-0.21
Spirits, Wines, and Beverages	-1.64	-0.70
Cotton Manufactures	-3.94	-1.41
Flax, Hemp, Jute, and Manufactures	-1.14	-1.41
Wool and Manufactures	-3.92	-0.52
Silk and Silk Goods	-3.92	-0.52
Pulp, Paper, and Books	-0.69	-1.63
Sundries	-1.66	-1.66

Sources: Main elasticities: Fontagné et al. (2022, p. 12); *Alternative I* elasticities: Stern et al. (1976, p. 22), matched to industry categories by Irwin (2010, p. 115); *Alternative II* elasticities: Shiells et al. (1986, p. 515), matched to industry categories by Irwin (2010, p. 115).

Appendix B

New South Wales: Import values and tariffs by industry, 1900

	Value (£)	Value (per cent)	*Ad valorem* equivalent tariff (per cent)
Main			
Live Animals and Animal Products	1,241,284	5.4	0.0
Vegetable Products	2,260,827	9.9	6.4
Animal or Vegetable Fats and Oils	284,806	1.2	0.0
Prepared Foodstuffs, Beverages, and Tobacco	2,576,253	11.3	66.3
Mineral Products	568,341	2.5	0.0
Products of Chemical Industries	1,208,006	5.3	0.0
Plastic and Articles thereof	45,941	0.2	0.0
Raw Hides and Skins, Leather and Articles Thereof	741,798	3.2	0.0
Wood/Cork and Articles of Wood/Cork	649,791	2.8	0.0
Pulp of Wood or other Cellulosic Materials	773,893	3.4	0.0
Textile and Textile Articles	5,745,935	25.1	0.0
Footwear, Headgear, Umbrellas and Prepared Feathers	787,284	3.4	0.0
Articles of Stone, Plaster, Ceramic, and Glass	357,118	1.6	0.0
Natural Cultured Pearls and Precious Stones and Metals	226,031	1.0	0.0
Base Metals and Articles of Base Metals	2,941,454	12.8	0.0
Machinery, Mechanical Appliances, and Electrical Machinery	1,124,387	4.9	0.0
Vehicles, Aircraft, and Transport Equipment	270,096	1.2	0.0
Optical, Photographic, Precision and Medical Instruments	335,668	1.5	0.0
Arms and Ammunitions	120,623	0.5	0.0
Miscellaneous	639,239	2.8	0.0
Works of Art	0	0.0	0.0
Alternative			
Chemicals, Oils, Paints	1,541,899	6.7	0.2
Earthenware and Glassware	423,663	1.9	0.0
Metals and Manufactures	4,535,482	19.8	0.0
Wood and Manufactures	1,023,558	4.5	0.0
Sugar, Molasses, and Manufactures	782,302	3.4	23.7
Tobacco and Manufactures	317,860	1.4	141.7
Agricultural Products	4,309,135	18.8	2.2
Spirits, Wines, and Beverages	1,312,447	5.7	85.4
Cotton Manufactures	3,916,973	17.1	0.0
Flax, Hemp, Jute, and Manufactures	443,394	1.9	0.0
Wool and Manufactures	1,524,875	6.7	0.0
Silk and Silk Goods	191,599	0.8	0.0
Pulp, Paper, and Books	608,467	2.7	0.0
Sundries	1,967,121	8.6	0.0

Source: Statistical register for 1900 and previous years.

Queensland: Import values and tariffs by industry, 1900

	Value (£)	Value (per cent)	*Ad valorem* equivalent tariff (per cent)
Main			
Live Animals and Animal Products	187,130	2.8	8.8
Vegetable Products	1,126,953	16.6	3.6
Animal or Vegetable Fats and Oils	40,303	0.6	20.5
Prepared Foodstuffs, Beverages, and Tobacco	564,107	8.3	111.1
Mineral Products	187,660	2.8	29.4
Products of Chemical Industries	390,961	5.8	9.9
Plastic and Articles thereof	10,196	0.2	1.9
Raw Hides and Skins, Leather and Articles Thereof	85,687	1.3	12.5
Wood/Cork and Articles of Wood/Cork	70,891	1.0	14.5
Pulp of Wood or other Cellulosic Materials	192,422	2.8	5.6
Textile and Textile Articles	1,355,671	20.0	12.6
Footwear, Headgear, Umbrellas and Prepared Feathers	228,792	3.4	20.5
Articles of Stone, Plaster, Ceramic, and Glass	100,932	1.5	17.1
Natural Cultured Pearls and Precious Stones and Metals	39,623	0.6	22.0
Base Metals and Articles of Base Metals	1,226,456	18.1	5.3
Machinery, Mechanical Appliances, and Electrical Machinery	384,616	5.7	4.4
Vehicles, Aircraft, and Transport Equipment	69,540	1.0	11.9
Optical, Photographic, Precision and Medical Instruments	110,212	1.6	13.7
Arms and Ammunitions	147,345	2.2	1.9
Miscellaneous	268,144	3.9	16.1
Works of Art	5,171	0.1	0.9
Alternative			
Chemicals, Oils, Paints	512,565	7.5	19.7
Earthenware and Glassware	108,015	1.6	18.2
Metals and Manufactures	1,644,470	24.2	5.5
Wood and Manufactures	200,514	3.0	17.8
Sugar, Molasses, and Manufactures	10,892	0.2	30.1
Tobacco and Manufactures	91,766	1.4	204.4
Agricultural Products	1,408,401	20.7	25.8
Spirits, Wines, and Beverages	429,073	6.3	111.5
Cotton Manufactures	1,059,976	15.6	14.7
Flax, Hemp, Jute, and Manufactures	156,247	2.3	3.2
Wool and Manufactures	183,945	2.7	15.3
Silk and Silk Goods	40,598	0.6	15.2
Pulp, Paper, and Books	161,544	2.4	2.5
Sundries	784,806	11.6	12.0

Source: Statistics of the colony of Queensland for the year 1900.

South Australia: Import values and tariffs by industry, 1900

	Value (£)	Value (per cent)	*Ad valorem* equivalent tariff (per cent)
Main			
Live Animals and Animal Products	158,577	2.8	16.7
Vegetable Products	239,085	4.3	41.4
Animal or Vegetable Fats and Oils	43,992	0.8	18.7
Prepared Foodstuffs, Beverages, and Tobacco	690,236	12.3	62.7
Mineral Products	474,883	8.5	3.4
Products of Chemical Industries	346,273	6.2	7.6
Plastic and Articles thereof	6,952	0.1	0.0
Raw Hides and Skins, Leather and Articles Thereof	124,799	2.2	2.0
Wood/Cork and Articles of Wood/Cork	300,885	5.4	6.6
Pulp of Wood or other Cellulosic Materials	163,357	2.9	5.8
Textile and Textile Articles	1,566,172	27.9	7.2
Footwear, Headgear, Umbrellas and Prepared Feathers	116,763	2.1	23.8
Articles of Stone, Plaster, Ceramic, and Glass	59,481	1.1	16.4
Natural Cultured Pearls and Precious Stones and Metals	45,470	0.8	14.1
Base Metals and Articles of Base Metals	648,944	11.6	4.3
Machinery, Mechanical Appliances, and Electrical Machinery	189,921	3.4	11.8
Vehicles, Aircraft, and Transport Equipment	101,925	1.8	8.2
Optical, Photographic, Precision and Medical Instruments	58,896	1.0	11.8
Arms and Ammunitions	10,732	0.2	0.1
Miscellaneous	260,520	4.6	11.3
Works of Art	5,933	0.1	0.0
Alternative			
Chemicals, Oils, Paints	423,885	7.6	11.5
Earthenware and Glassware	70,173	1.3	16.3
Metals and Manufactures	883,688	15.7	6.7
Wood and Manufactures	343,756	6.1	8.8
Sugar, Molasses, and Manufactures	389,080	6.9	24.6
Tobacco and Manufactures	67,708	1.2	151.5
Agricultural Products	901,964	16.1	12.5
Spirits, Wines, and Beverages	242,086	4.3	101.1
Cotton Manufactures	860,269	15.3	10.1
Flax, Hemp, Jute, and Manufactures	187,449	3.3	1.2
Wool and Manufactures	543,379	9.7	5.6
Silk and Silk Goods	0	0.0	0.0
Pulp, Paper, and Books	128,163	2.3	3.6
Sundries	572,196	10.2	11.3

Source: Statistical register. 1900.

Tasmania: Import values and tariffs by industry, 1900

	Value (£)	Value (per cent)	*Ad valorem* equivalent tariff (per cent)
Main			
Live Animals and Animal Products	92,870	4.6	15.6
Vegetable Products	126,334	6.2	28.6
Animal or Vegetable Fats and Oils	18,454	0.9	18.7
Prepared Foodstuffs, Beverages, and Tobacco	235,558	11.6	89.6
Mineral Products	80,241	4.0	23.5
Products of Chemical Industries	118,555	5.8	13.4
Plastic and Articles thereof	0	0.0	0.0
Raw Hides and Skins, Leather and Articles Thereof	26,123	1.3	5.8
Wood/Cork and Articles of Wood/Cork	33,074	1.6	18.0
Pulp of Wood or other Cellulosic Materials	64,983	3.2	9.0
Textile and Textile Articles	515,318	25.4	17.3
Footwear, Headgear, Umbrellas and Prepared Feathers	46,454	2.3	19.9
Articles of Stone, Plaster, Ceramic, and Glass	43,584	2.1	17.7
Natural Cultured Pearls and Precious Stones and Metals	13,706	0.7	20.0
Base Metals and Articles of Base Metals	308,153	15.2	9.2
Machinery, Mechanical Appliances, and Electrical Machinery	110,164	5.4	6.9
Vehicles, Aircraft, and Transport Equipment	4,984	0.2	7.9
Optical, Photographic, Precision and Medical Instruments	17,940	0.9	19.4
Arms and Ammunitions	2,120	0.1	20.0
Miscellaneous	170,090	8.4	13.1
Works of Art	1,954	0.1	0.0
Alternative			
Chemicals, Oils, Paints	172,497	8.5	19.0
Earthenware and Glassware	34,443	1,7	15.6
Metals and Manufactures	432,308	21.3	8.7
Wood and Manufactures	51,964	2.6	19.6
Sugar, Molasses, and Manufactures	117,491	5.8	40.7
Tobacco and Manufactures	42,461	2.1	159.2
Agricultural Products	263,301	13.0	18.7
Spirits, Wines, and Beverages	105,185	5.2	98.2
Cotton Manufactures	493,374	24.3	19.9
Flax, Hemp, Jute, and Manufactures	63,138	3.1	0.4
Wool and Manufactures	5,021	0.3	0.0
Silk and Silk Goods	0	0.0	0.0
Pulp, Paper, and Books	65,295	3.2	9.0
Sundries	184,180	9.1	14.4

Source: Statistics of the colony of Tasmania for the year 1900.

Victoria: Import values and tariffs by industry, 1900

	Value (£)	Value (per cent)	*Ad valorem* equivalent tariff (per cent)
Main			
Live Animals and Animal Products	1,037,441	6.2	14.7
Vegetable Products	950,916	5.7	47.9
Animal or Vegetable Fats and Oils	98,143	0.6	11.5
Prepared Foodstuffs, Beverages, and Tobacco	1,661,624	10.0	79.6
Mineral Products	719,632	4.3	2.9
Products of Chemical Industries	741,329	4.4	6.2
Plastic and Articles thereof	88,980	0.5	0.0
Raw Hides and Skins, Leather and Articles Thereof	586,104	3.5	5.0
Wood/Cork and Articles of Wood/Cork	635,489	3.8	8.5
Pulp of Wood or other Cellulosic Materials	588,218	3.5	4.6
Textile and Textile Articles	5,810,769	34.9	4.7
Footwear, Headgear, Umbrellas and Prepared Feathers	150,554	0.9	22.1
Articles of Stone, Plaster, Ceramic, and Glass	260,390	1.6	15.9
Natural Cultured Pearls and Precious Stones and Metals	136,910	0.8	9.0
Base Metals and Articles of Base Metals	1,818,682	10.9	3.6
Machinery, Mechanical Appliances, and Electrical Machinery	388,205	2.3	8.2
Vehicles, Aircraft, and Transport Equipment	183,576	1.1	6.4
Optical, Photographic, Precision and Medical Instruments	271,276	1.6	12.0
Arms and Ammunitions	48,690	0.3	4.3
Miscellaneous	460,677	2.8	8.5
Works of Art	21,510	0.1	0.0
Alternative			
Chemicals, Oils, Paints	958,421	5.8	6.2
Earthenware and Glassware	248,032	1.5	15.7
Metals and Manufactures	2,423,860	14.6	4.9
Wood and Manufactures	741,875	4.5	10.0
Sugar, Molasses, and Manufactures	721,121	4.3	47.0
Tobacco and Manufactures	254,927	1.5	145.8
Agricultural Products	2,847,874	17.1	17.5
Spirits, Wines, and Beverages	792,209	4.8	93.1
Cotton Manufactures	2,246,062	13.5	5.4
Flax, Hemp, Jute, and Manufactures	455,279	2.7	1.5
Wool and Manufactures	2,707,923	16.3	3.7
Silk and Silk Goods	390,038	2.3	13.2
Pulp, Paper, and Books	540,136	3.2	3.7
Sundries	1,331,358	8.0	9.5

Source: Statistical register of the colony of Victoria for the year 1900.

Western Australia: Import values and tariffs by industry, 1900

	Value (£)	Value (per cent)	*Ad valorem* equivalent tariff (per cent)
Main			
Live Animals and Animal Products	754,798	12.7	17.2
Vegetable Products	455,738	7.6	20.7
Animal or Vegetable Fats and Oils	35,538	0.6	7.1
Prepared Foodstuffs, Beverages, and Tobacco	749,854	12.6	64.1
Mineral Products	221,822	3.7	2.4
Products of Chemical Industries	477,086	8.0	4.5
Plastic and Articles thereof	7,963	0.1	1.9
Raw Hides and Skins, Leather and Articles Thereof	76,859	1.3	10.9
Wood/Cork and Articles of Wood/Cork	69,241	1.2	14.1
Pulp of Wood or other Cellulosic Materials	106,798	1.8	5.5
Textile and Textile Articles	797,089	13.4	11.9
Footwear, Headgear, Umbrellas and Prepared Feathers	116,730	2.0	16.0
Articles of Stone, Plaster, Ceramic, and Glass	51,539	0.9	11.8
Natural Cultured Pearls and Precious Stones and Metals	26,242	0.4	20.0
Base Metals and Articles of Base Metals	1,059,641	17.8	1.7
Machinery, Mechanical Appliances, and Electrical Machinery	591,086	9.9	6.1
Vehicles, Aircraft, and Transport Equipment	117,080	2.0	6.6
Optical, Photographic, Precision and Medical Instruments	53,377	0.9	12.7
Arms and Ammunitions	13,570	0.2	10.0
Miscellaneous	176,325	3.0	7.9
Works of Art	1,127	0.0	20.0
Alternative			
Chemicals, Oils, Paints	560,046	9.4	4.4
Earthenware and Glassware	70,978	1.2	13.1
Metals and Manufactures	1,764,403	29.6	3.6
Wood and Manufactures	117,510	2.0	14.7
Sugar, Molasses, and Manufactures	140,950	2.4	2.7
Tobacco and Manufactures	96,423	1.6	144.3
Agricultural Products	1,534,526	25.8	16.8
Spirits, Wines, and Beverages	314,158	5.3	95.8
Cotton Manufactures	700,147	11.8	12.8
Flax, Hemp, Jute, and Manufactures	55,569	0.9	6.1
Wool and Manufactures	42,305	0.7	6.2
Silk and Silk Goods	10	0.0	0.0
Pulp, Paper, and Books	79,756	1.3	2.3
Sundries	482,722	8.1	11.2

Source: Statistical register of the colony of Western Australia for 1900 and previous years.

Australia: Import values and tariffs by industry, 1903

	Value (£)	Value (per cent)	*Ad valorem* equivalent tariff (per cent)
Main			
Live Animals and Animal Products	601,609	1.6	19.8
Vegetable Products	5,038,976	13.8	24.0
Animal or Vegetable Fats and Oils	277,852	0.8	17.9
Prepared Foodstuffs, Beverages, and Tobacco	3,920,788	10.7	88.1
Mineral Products	837,216	2.3	9.9
Products of Chemical Industries	2,387,828	6.5	6.4
Plastic and Articles thereof	229,427	0.6	8.8
Raw Hides and Skins, Leather and Articles Thereof	596,656	1.6	13.3
Wood/Cork and Articles of Wood/Cork	1,146,557	3.1	11.2
Pulp of Wood or other Cellulosic Materials	1,494,553	4.1	6.3
Textile and Textile Articles	8,882,366	24.3	11.6
Footwear, Headgear, Umbrellas and Prepared Feathers	764,369	2.1	20.7
Articles of Stone, Plaster, Ceramic, and Glass	546,687	1.5	18.6
Natural Cultured Pearls and Precious Stones and Metals	417,208	1.1	17.8
Base Metals and Articles of Base Metals	4,577,872	12.5	6.1
Machinery, Mechanical Appliances, and Electrical Machinery	2,638,843	7.2	7.6
Vehicles, Aircraft, and Transport Equipment	490,703	1.3	18.0
Optical, Photographic, Precision and Medical Instruments	534,649	1.5	15.0
Arms and Ammunitions	321,038	0.9	2.1
Miscellaneous	818,096	2.2	15.2
Works of Art	10,586	0.0	0.0
Alternative			
Chemicals, Oils, Paints	2,737,147	7.5	7.8
Earthenware and Glassware	562,232	1.5	17.4
Metals and Manufactures	7,658,947	21.0	7.3
Wood and Manufactures	1,692,819	4.6	14.3
Sugar, Molasses, and Manufactures	1,177,039	3.2	50.2
Tobacco and Manufactures	570,776	1.6	154.8
Agricultural Products	6,395,825	17.5	23.2
Spirits, Wines, and Beverages	2,001,409	5.5	91.6
Cotton Manufactures	5,432,650	14.9	12.8
Flax, Hemp, Jute, and Manufactures	856,949	2.3	3.4
Wool and Manufactures	1,781,727	4.9	14.4
Silk and Silk Goods	1,301,349	3.6	12.0
Pulp, Paper, and Books	1,281,147	3.5	4.1
Sundries	3,083,863	8.4	14.0

Source: Annual statement of the trade of the Commonwealth of Australia with the United Kingdom, British possessions, and foreign countries for the year 1903.