

## **The Impact of Federation on Australia's Trade Flows**

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### **Introduction**

Until Federation, each of the Australian colonies determined its own tariff on imports. Because each Australian colony was an independent political entity, these tariffs applied to trade between them as well. In 1901, the Australian colonies joined together in a political federation, setting the stage for the formation of a customs union in 1902. As a result, all duties on intra-Australian trade were abolished and a common external tariff was imposed.

This paper seeks to assess the impact of the customs union on Australia's intra- and international trade flows by exploiting a unique aspect of Australian trade statistics. The Australian states collected data on trade with other prior to Federation, and continued to do so for nine years after Federation. Thus, we can observe the impact of the customs union on Australia's internal and external trade flows.

These data also allow us to examine border effects (the difference between intranational and international trade), as explored in a large literature started by McCallum (1995).

### **The Formation of the Australian Customs Union**

The Australian states achieved a large measure of tariff autonomy with the passage of the Australian Colonies Government Act by the British parliament in 1850. However, Britain required that the tariffs of each state be non-discriminatory and uniform across all trading partners. The ban on differential duties meant that the colonies could not give each other, or even Britain, preferential treatment in terms of its tariff code.

This ban on discrimination, in keeping with Britain's strong belief in universal free trade, had the unintended consequence of preventing closer economic ties between the Australian states, and even became a source of strife and discontent. Conflict between New South Wales and Victoria over the customs treatment of border trade along the Murray and Darling rivers was particular source of difficulty, but was far from the only problem. Six intercolonial conferences in the decade after 1863 failed to improve matters and "at each the disagreement became more bitter" (Reitsman 1960, p. 6). Indeed, in the words of one historian of early Australian tariff policy: "the history of the trade relations of the Australian colonies, it must be confessed, is a sorry record of intercolonial jealousy and strife" (Allin 1918, p. 1). "Provincialism" is another word that has often been used to describe trade relations during this period.

Aside from border and customs problems, by the 1860s the tariff codes of each colony increasingly diverged (Patterson 1968). New South Wales maintained a free trade stance, eschewing duties on imported manufactured goods and applying tariffs almost

exclusively on “narcotics and stimulants” (tobacco and drink) for revenue purposes. In Victoria, tariffs became more protective by focusing on higher duties on imports of manufactured goods. Most of the other colonies chose a policy closer to Victoria’s, but somewhat more moderate.

Yet it was the failure to reduce barriers on intra-Australian trade, rather than concerns about protection, that was the driving force behind Federation. The desire to eliminate these barriers to internal trade was a principal reason that the drive toward Federation accelerated in the 1890s. As the first Minister for Trade and Customs said in parliament in 1901, “Years and years we have struggled for Federation. Why? So that the fiscal barriers which have so long divided the sister States should be removed” (quoted in Reitsman 1960, p. 11). The negotiations leading up to the formation of the Commonwealth were difficult; New Zealand dropped out of the discussions, and even the participation of Western Australia was in doubt. Finally, a constitution for the Australian commonwealth was approved by voters after a second public referendum in June 1899. The United Kingdom agreed to the arrangement in July 1900 and on January 1, 1901, the six states of Australia united under the federal constitution.

Under the constitution, the six states lost their tariff autonomy and all power to regulate foreign commerce devolved to the Federal government. However, commerce between the Australia states did not become free of duty until a common external tariff had been settled upon. The constitution provided that “uniform duties of customs shall be imposed within two years after the establishment of the Commonwealth,” but it did not take that long. (p. 492). The first common tariff was implemented on October 8, 1901. At that point, no duties were imposed on commerce between the states. (The exception to this rule was Western Australia, which was permitted to impose duties on goods from other states for up to five years.)

One difficult part of the negotiation leading to Federation concerned customs duties. The transitional arrangement required the federal government to return to the states three-fourths of all customs and excise revenue for ten years after Federation.

### **Federation and Australia’s Trade Flows**

At the time of Federation, the Australian states were highly integrated economies, with few barriers to interchange except the tariff. As Forster (1975, p. x) put it, “there were no barriers to the free flow of capital and labour, economic institutions often operated across several colonies and of course there was very close resemblance in language, laws, and social institutions generally.” The principal barrier to exchange between the Australian states had been tariffs, which were now removed. What was the impact of this tariff reduction?

The impact largely depends on the height of pre- and post-Federation tariffs. Owing to the difficulties in summarizing trade policy in a single metric, there is no easy answer to this question. Table 1 presents some very rough indicators on the tariff levels of the states prior to Federation. These figures are based upon customs revenue divided by total imports and are misleading in two ways. First, the greatest revenue raising duties came from imposing specific duties on “intoxicants and narcotics” – ale and beer, spirits and wine, opium and tobacco. In the case of New South Wales, this accounts for virtually all of the 5 percent tariff indicated. In fact, after 1896, New South Wales did not

maintain any tariffs on imported manufactured goods. In addition, domestic excise taxes were also levied on domestic production of tobacco and alcohol goods, and the tariff was essentially the international extension of those domestic excises. Ad valorem duties were imposed on sugar, tea, and dried fruit, but it had otherwise abolished almost all other ad valorem duties in 1896. Thus, New South Wales maintained about as free trade a policy as was fiscally feasible.

By contrast, although Victoria seems to have a similar tariff level to New South Wales, it imposed significant duties on imported manufactured goods. The average ad valorem tariff on manufactured goods was roughly 19 percent. [more on other states]

Not only are the tariff levels in Table 1 potentially misleading indicators of trade barriers, they are misleading indicators of trade barriers on the goods that most entered into intra-Australia trade. [description]

What about the level of the first common external tariff? Forster (1977) suggests that the compromise was not between free trade and existing protection, but between existing protection and further protection. In his view, the compromise tariff was substantially closer to Victoria's than to New South Wales's. He concludes (p. xx): "for the colonies as a whole that tariff was raised considerably."

As a result, the impact on the various states would differ depending upon their initial tariff level. For example, New South Wales did not levy significant tariffs on intra-Australian trade. The customs union would not result in much trade creation with the other Australian states because it did not tax their goods prior to the union. However, New South Wales was required to increase its external tariff considerably as a result of Federation, and hence trade diversion from the rest of the world to the Australia states would be the predominant impact. By contrast, Victoria did impose duties on import from Australia states. If the common external tariff did not significantly change as a result of Federation, then Victoria could be expected to experience trade creation with the rest of Australia since it abolished all duties on those goods. The other Australian states with high initial tariffs also may have been in the position of maintaining the same external tariff but abolishing duties on internal trade. Western Australia's trade might not be affected by Federation much at all since it continued to impose duties on intra-Australian trade until 1907.

Figure 1 gives one view of how intra- and inter-national trade changed over the period 1893 to 1909. This measure of intra-Australian trade (imports) shows a decline for most countries in the years prior to Federation. Federation appears to have reversed this decline. [also show for exports] Contrary to what might have been expected, there is not much increase in the share of Victoria's imports coming from other Australian states.

### **Gravity Model of Australia's Trade**

An applied general equilibrium model of the Australian economy at this time might be the best approach to assessing the overall trade creation, trade diversion, and economic welfare effects of Federation. Due to the complexity of such a simulation, and its demanding data requirements of such a model, this paper will focus on Australia's actual trade data at the time of Federation. Such an ex post interpretation of Federation is problematic as well because post-Federation trade flows may be affected by a host of other factors aside from Federation itself. For example, a drought particularly affected

the trade of New South Wales in 1902-03, right after Federation, making a comparison of the years 1900 and 1902 quite imperfect.

This paper takes the approach of trying to assess the difference between Australia's intranational and international trade around the time of Federation. This is an indirect approach to the question of how Federation affected Australia's trade, and relies on the gravity equation, which relates a country's trade to its economic size and distance from trading partners. In an influential article, McCallum (1995) used data on intra-provincial trade in Canada to compare Canada's intra- and inter-national trade. This approach provided an estimate of the implicit obstacles to trade created by national borders. McCallum estimated the following equation:

$$(1) \quad \log(X_{ij} + X_{ji}) = \alpha + \beta_1 y_i + \beta_2 y_j + \beta_3 \log(DIS_{ij}) + \gamma \delta_{ij} + \varepsilon_{ij}$$

where  $X_{ij}$  is exports from region  $i$  to region  $j$ ,  $y_i$  is the economic size (measured by GDP) of region  $i$ ,  $DIS_{ij}$  is the distance between regions  $i$  and  $j$ , and  $\delta_{ij}$  is a dummy variable that takes the value of one if  $i$  and  $j$  belong to the same country (i.e., an indicator of intra-national trade). Using data for 1988, McCallum found that the coefficient on the dummy variable was 3.1. Taking the exponential of this estimate yielded the implication that trade between Canadian provinces was 22 times greater than trade between the provinces and the United States.

Anderson and van Wincoop (2003), however, noted that there is not one measure of the border effect because of the asymmetries created by different size of countries. A given border effect will be large when measured from the standpoint of a small country, but small when measured from the standpoint of the large country. Anderson and Wincoop (2003) also developed a specification to estimate border effects that is more closely tied to economic theory. The appropriate specification (constraining the coefficients on GDP to equal one) is:

$$(2) \quad \log(X_{ij} / y_i y_j) = \rho(1 - \sigma) \log(DIS_{ij}) + (1 - \sigma) \tau_{ij} + \log(P_i)^{\sigma-1} + \log(P_j)^{\sigma-1} + (1 - \sigma) \varepsilon_{ij}$$

where  $\sigma$  is the elasticity of substitution in consumption between all goods,  $\tau$  is the trade cost or implicit tax barrier to trade between regions, and the  $P$ 's are "multilateral resistance" variables. Because the  $P$ 's are not readily calculated, country fixed effects have been proposed an alternative that leads to consistent (but less efficient) results. In addition, XXXcapture the implicit barrier by indicator for the move and transform. As a result, the estimating equation is:

$$(3) \quad \log(X_{ij} / y_i y_j) = \alpha \log(DIS_{ij}) + \gamma(1 - D_{ij}) + \beta \delta_i + \beta \delta_j + (1 - \sigma) \varepsilon_{ij} .$$

Sufficient data exists from the Federation period for this equation to be estimated for Australia. The intra-Australian trade and external trade data is from the annual statistical abstracts of the (six) Australian states: New South Wales, Victoria, South Australia, Queensland, Western Australia, and Tasmania. One recurring question about these data is the extent to which they are compromised by goods in transit between these states but are ultimately destined for other countries. The export data for New South

Wales, Victoria, and South Australia explicitly separate out locally produced goods from those of other Australian state whose goods are in transit to other destinations. Tasmania also presents data both on exports and exports by country of final destination (e.g., exports to NSW are large, but many were ultimately going to the United Kingdom). The main question is for Queensland and Western Australia (and I am currently checking on these, matching with import data from NSW and Victoria).

GDP is taken from Maddison (2003). Maddison presents data for 20 countries with which some of the large Australian states (New South Wales, Victoria) traded: New Zealand, United Kingdom, Canada, India, Ceylon (Sri Lanka), Argentina, Brazil, Chile, Belgium, Holland (the Netherlands), France, Germany, Italy, Sweden, China, Japan, Java (Indonesia), Mexico, Peru, and the United States. For Australia, total GDP is taken from Maddison (2003) and apportioned to New South Wales and Victoria based on the GDP shares in Haig (2001), while the remainder is apportioned to the other states based on population.

Distance is sea shipping distance from <http://www.distances.com>.

Equations (1) and (3) are estimated for 1890, 1900, 1906, and 1909. This gives us a picture of Australia's trade well prior to Federation, just prior to Federation, and several years after Federation. The year 1900 is just prior to Federation, but unfortunately the years 1902-04 are affected by drought. Therefore, the year 1906 is taken to represent Australia's trade after Federation. The year 1909 captures the impact of the much higher Australian tariff imposed in 1907.

Table 1 presents the econometric results. The first column is for 1890 and the coefficient on the dummy variable indicating intra-Australian trade is 2.85. (The estimates for 1890 do not include observations for Western Australia's or Tasmania's exports; they did not report trade statistics with sufficient detail in that year.) Taking the exponential of this estimate suggests that intra-Australian trade is 17 times greater than trade between Australia and the rest of the world. In addition, taking the exponential of the coefficient on the Commonwealth indicator suggests that trade within the British empire was 6 times greater than trade with the rest of the world. As is commonly noted, these are exceptionally high figures.

The second column for 1890 estimates equation (3) and includes fixed effects (for the exporting state and for the importing region, of which there are four – Oceania, Asia, Europe, and the Americas). How should we interpret the estimate of gamma as -1.24? As Feenstra (2002) notes,  $(1-\sigma)\tau_{ij}$  was replaced by  $\gamma(1-\delta_{ij})$ , so equating these two and solving for the exponential of  $\exp(\tau_{ij})$  yields  $\exp[\gamma(1-\delta_{ij})/(1-\sigma)]$ . For cross-border trade (i.e.,  $\delta_{ij} = 0$ ), so  $\exp(\tau_{ij}) = \exp[\gamma/(1-\sigma)]$ . If we take  $\sigma = 5$ , then the estimate of  $\exp(\tau_{ij}) = 1.36$ . This suggests that the implicit border barrier between Australia and the rest of the world amounts to a tax of 36 percent. However, this implicit price barrier is highly sensitive to the assumed elasticity of substitution: with a  $\sigma = 4$ , for example, the implicit tax rises to 51 percent, and if  $\sigma = 3$ , then the tax is about 86 percent. We lack any solid information on the elasticity of substitution between domestic and foreign goods; it could be that Australian products were quite different from foreign (imported) goods, making for a low elasticity of substitution.

We cannot use the estimate of  $\gamma$  to determine how much more trade within Australia than across the border, but the exponential of it gives the geometric mean of the Australian and rest of the world border effects (Feenstra 2002). In this case  $e^{1.24} = 3.46$ . Thus, this refers to the average effect of the border on intranational relative to international trade, taking into account the differential effect of size on the border effect. What this clearly indicates is that there was a significant border effect even prior to Federation. The question will be how this border effect changes as a result of Federation.

The results for 1900 are more noteworthy than those for 1890 because it includes the trade of all six states, resulting in many more observations. The results indicate a decline in size of the intra-Australian trade variable, suggesting that the degree of intra-state trade fell from 17 in 1890 to 12 in 1900. Similarly, the magnitude of the Commonwealth dummy variable falls as well. Despite this, the implicit tax coming from the fixed-effect estimation indicates a slight rise in the average border effect to 41 percent (again assuming  $\sigma = 5$ ). The average border affect is little changed from 1890.

The final four columns for Table 2 report similar regressions for 1906 and 1909, the last year in which the Australian states reported intra-Australian trade. The coefficient on intra-Australian trade increases in 1906 compared to 1900, as one would expect with the customs union. Intra-Commonwealth trade continues to decline relatively. However, the implicit border tax and average border effect are somewhat smaller in 1906 than in 1900. This implies that Federation did not have a substantial impact on the “border” between 1900 and 1906.

By 1909, however, after the imposition of a protectionist tariff in 1907, the border effect does indeed change markedly. Intra-Australian trade is now 33 times greater than external trade. The implicit border tax rises from about 36 to 41 percent to 64 percent, and the average border effect is almost double what it had been prior to that time. According to a League of Nations study, the average Australian tariff on manufactured goods rose from 6 percent in 1902 to 16 percent in 1913 (Anderson and Garnaut 1987, p. 7). Thus, it appears that a much greater degree of protection was adopted not as a result of Federation, but shortly thereafter.

The other significant change in the 1907 tariff was the introduction of tariff preferences for the British Commonwealth. These preferences appear to have the slight effect of halting the decline in intra-Commonwealth trade that was evident up to this point.

These results suggest that the later import tariffs imposed by Australia altered its external trade to a much more significant degree than Federation itself. These effects are summarized in Table 3, which shows how much an outlier the year 1909 is in comparison with the other years.

## Conclusions

[to be written]

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**Table 1: Estimates of Average Import Duties**

	<b>1900</b>	<b>1903</b>	<b>1909</b>
Australia	--	18.6	17.1
New South Wales	5.2	--	--
Victoria	10.7	--	--
South Australia	17.7	--	--
Queensland	17.0	--	--
Western Australia	16.0	--	--
Tasmania	22.7	--	--

Sources: calculated from

**Table 2: Estimates of Border Effects**

	1890		1900		1906		1909	
Distance	-0.36 (0.47)	-1.01* (0.53)	-0.63* (0.33)	-1.24* (0.56)	-0.56 (0.41)	-0.70 (0.55)	-0.33* (0.39)	-1.20* (0.62)
Indicator - Australian Trade	2.85* (0.96)	--	2.53* (0.77)	--	2.95* (0.86)	--	3.44* (0.91)	--
Indicator - Commonwealth Trade	1.84* (0.84)	--	1.61* (0.58)	--	1.26* (0.61)	--	1.33* (0.57)	--
Indicator - Border	--	-1.24* (0.58)	--	-1.36* (0.65)	--	-1.23* (0.74)	--	-1.97* (1.00)
Indicator – Non- Commonwealth	--	-2.05* (0.95)		-1.85* (0.57)	--	-1.24* (0.71)	--	-1.67* (0.55)
R <sup>2</sup>	0.54	0.68	0.52	0.60	0.52	0.59	0.52	0.62
Fixed Effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	66	66	118	118	113	113	117	117

**Table 3: Summary of Results**

	Intra-Australian Trade	Intra-Commonwealth Trade	Implicit Border Tax ( $\sigma = 5$ )	Average Border Effect
1890	17	6	36%	3.5
1900	12	5	41%	3.9
1906	19	3.5	36%	3.4
1909	31	3.8	64%	7.2



**Figure 1: Share of Australian Imports in Total Imports**

