

Which States Gained, and Which States Lost, from Australia's
Federation Customs Union of 1902? The Answers of a Theoretical
Schema, with an Empirical Check

William Coleman

Research School of Economics,
The Australian National University

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The passage of the *Customs Tariff Act* of 1902, in the wake of Australian Federation of 1901, simultaneously abolished tariffs on intra-Australian trade, while establishing a tariff wall around the whole of Australia with respect international trade. What were the effects of the establishment of this two pronged trade regimen? Did it benefit each state, as presumably, the earnest Federationist believed? Or did it benefit some states at the expense of the others? The paper uses a simple schematisation of the Australian economy at the beginning of the 20th c to advance some answers.¹

The paper's schematisation suggests Victoria would have benefitted from the new trade regimen, in consequence of higher prices received for her manufactured exports. And NSW would be worse off, because of the higher prices paid for her imports of manufactures. The model makes no clear cut prediction of the welfare impact on the four smaller states, but identifies some factors which govern whether the impact will be favourable or unfavourable. Finally, the model allows the possibility that NSW may not have been injured, as the rise in price in manufactures might have been large enough to transform NSW into an exporter of manufacturers, and thus 'another Victoria'. The likelihood of this possibility is a different question.

The analysis' predictions are shown to survive one simple empirical check.

The paper concludes by demonstrating that the implications of the analysis are relatively robust to variation in the assumptions made.

¹ For other analyses of this question, Foster (1977), Irwin (2006) and Coleman (2018).

I The Model

Consider an interpretation of the Australian economy at the opening of the 20th century which posits two distinct bifurcations: one economic-technical and economic-institutional. Is

With respect to the economic-technical bifurcation, it supposed the whole of Australia 'rode on the sheep's back'- except for Victoria. In other words, in most of Australia the economy amounted to land-intensive goods ('wool') being exported, at world prices, to pay for the import of manufactures. In Victoria, however, by the close of the 19th c, low capital-intensity manufactures ('rope') had emerged, to the point that her own market in such manufactures was saturated; so that 'rope' was now exported by Victoria, in exchange for high capital-intensity manufactures from abroad ('steel'), and 'wool' from the rest of Australia. In summary, Victoria exported 'rope' to Australia to pay for imports of 'steel' from the rest of the world, and 'wool' from the rest of Australia. While the rest of Australia exported 'wool' to Victoria, and the rest of the world, to pay for imports of 'steel' and 'rope' from the rest of the world, and 'rope' from Victoria.

The model's second bifurcation supposes that all of Australia was protectionist – save for New South Wales. So NSW is supposed to have no tariffs on any good, but the other five states had tariffs on rope.² We suppose the rate rope tariff was same in all the five states which imposed one.

² It is assumed, for now, there is no tariff on the import of 'wool' into Victoria. It is also assumed, for now, there is no tariff on 'steel', either before or after 1902. Finally, we assume, for now, no steel is produced in Australia. All these assumptions are relaxed in Section IV.

II The Analysis

The key point about Federation as far as the schematisation of Section I is concerned is that it abolished the pre-Federation tariff on rope with respect to trade within Australia, while, with respect to international trade, it extended the rope tariff to NSW. In modelling this shock, the paper supposes the specific rate of the post-1902 rope tariff equalled the pre-1902 rope tariff rate; the essential qualification being, of course, that from 1902 the rate of tariff on imports of rope sourced from Australia was zero. It is also assumed that all the revenue obtained from any tariff on imports into any state is returned to that state.

In the model this new tariff regimen will unambiguously expand Victoria's rope exports, as four of her markets (Queensland, SA, WA and Tasmania) no longer tax the purchase of Victorian rope. Tracing any further consequences requires recognition of different possibilities regarding those exports. Under the new regimen, *either* Victoria's rope exports at world price plus tariff would be less than the rope imports of the remaining states, *or* they would not. Equivalently, under the new regimen, *either* Victoria's rope exports would not meet the entirety of rope imports of the remaining states (and rope imports from the rest of the world remain positive), *or* they will (shrinking their rope imports from the rest of the world to zero).

It is easy to see Victoria must be better off in the case of the first possibility. Whereas previously Victoria exported at world price, it now exports at world price plus tariff. It has all the benefits of an improvement in its terms of trade. This simple point is illustrated in Figure 1. The horizontal axis is measured in terms of physical units of rope. The vertical axis is measured in dollars. With respect to the production possibility curve, this comes down to measuring the vertical axis in dollars of wool output, as it is assumed (for now) no steel is

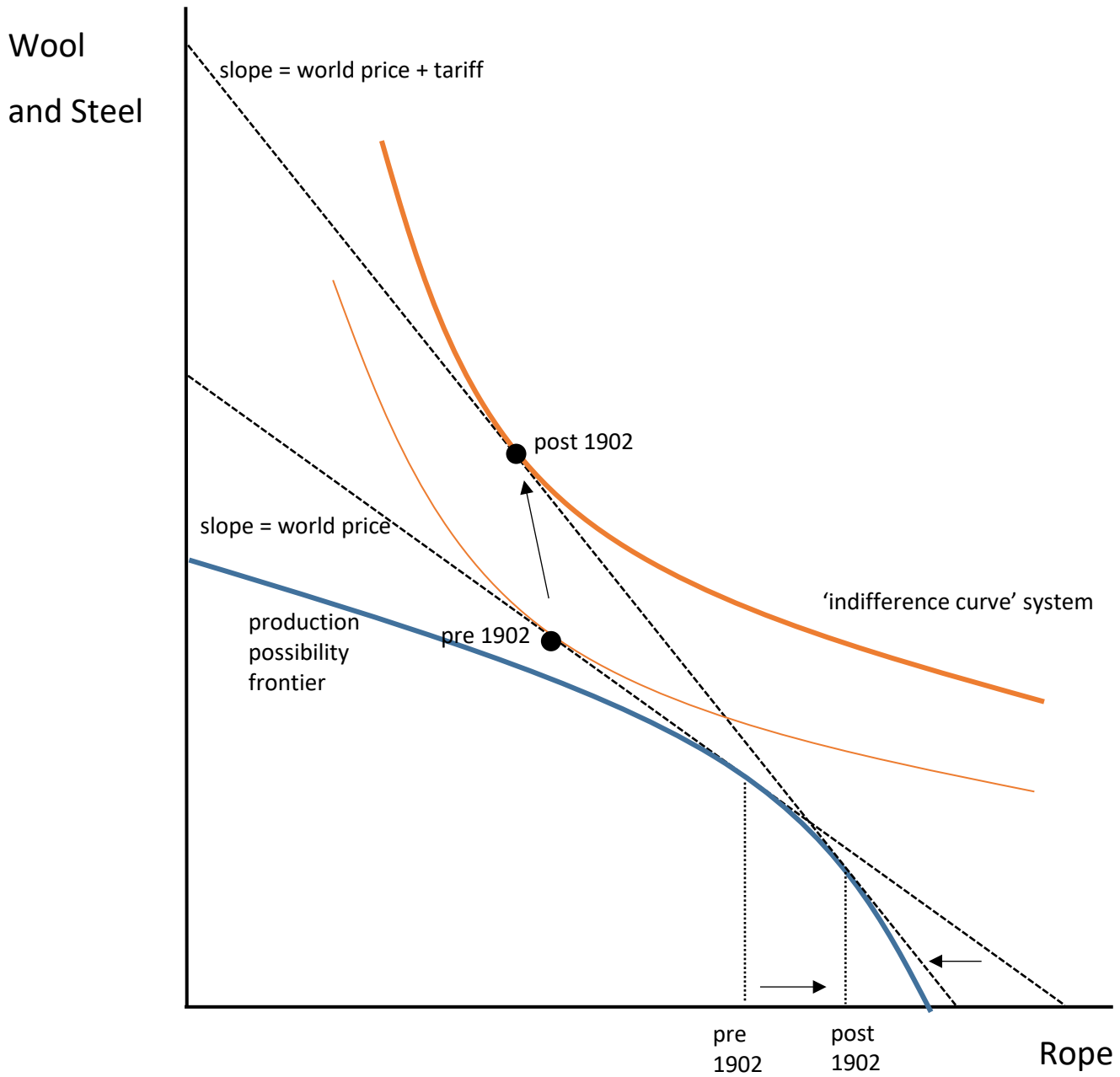
produced in Australia; and, since the price of wool is a given, the assumption further comes down to measuring the physical axis in physical units of wool. With respect to the figure's 'indifference curves'³, the vertical axis comes down to the dollar spend on wheat and steel. The existence of a 'marginal rate of substitution' between the consumption of rope and dollars spent on wheat and steel makes for an indifference curve. The dashed line indicates the budget constraint between rope consumption and spending on wheat and steel, for given prices of wheat rope and steel. The slope of the budget constraint equals the price of rope.

Evidently, the increase in the price at which Victoria sells rope post-1902 increases her rope production. It also steepens her budget constraint, and shifts it so that Victoria's welfare is unambiguously improved.

NSW, by contrast, must be worse off. Whereas previously it imported rope at the world price, it now imports at the world price plus tariff. NSW has experienced the classic welfare costs of a tariff, as articulated by basic trade theory. Only worse! 'Worse' because in the classic analysis of basic trade theory it would be assumed NSW obtains tariff revenue on all its rope imports; but, thanks to the customs union ordained by the *Customs Tariff Act*, NSW obtains revenue only on that portion it imports from the rest of the world.

³ More properly 'Potential Welfare Curves'. Each such curve plots a set of points that are Potential Pareto Equivalent.

Figure 1: Victoria's Welfare Increases Consequent to the Improvement in its Terms of Trade



Like NSW, the smaller states are also worse off. They have experienced no change in price; they imported rope at the world price plus tariff before 1902, and after 1902 they still import it at world price plus tariff. But they have now lost revenue to the extent that their rope imports are sourced from Victoria. To put the point another way: to the extent that they import from Victoria they no longer exchange their wool for rope at world price of rope, but at the world plus tariff.

So much for the case where Victoria's rope exports after 1902 do not supply all the rope imports of the rest of Australia.

Turning now to the possibility of Victoria's rope exports capturing all the demand of the rest of Australia, it remains the case that Victoria will be made unambiguously better off by the customs union of 1902. For although Victoria does not now export rope at the world price + tariff, it will export at a price to some degree higher than the world price thanks to the 'preferential trade agreement' with the rest of Australia that the *Customs Tariff Act* amounted to. Victoria, then, has still benefitted; her terms of trade have still improved; she still receives after 1902 more imports (wool and steel) for what she exports (rope) than before 1902.

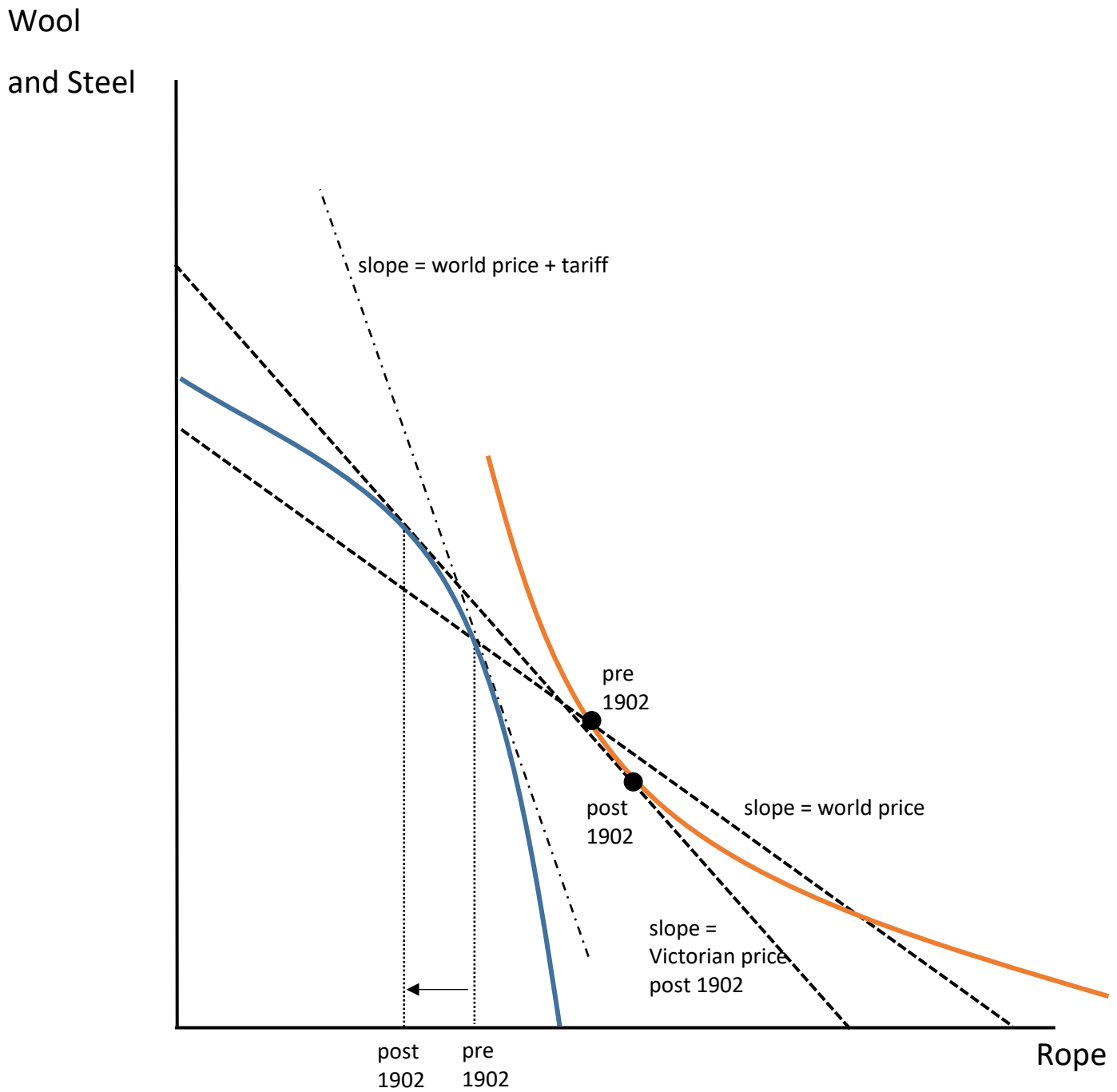
On the face of it, the other states must still be worse off. Their terms of trade of the four smaller states have still deteriorated relative to pre-1902; with rope now imported from Victoria at a price above the world price. And yet the four *smaller* states now also have a benefit from the federation customs union. Although the price paid to Victorian producers rises, the price paid by the consumers and producers in the smaller states will *fall*, thanks to the abolition of tariffs on Australian sourced rope imports, and on account of the necessity of Victorian exporters to cut price below the world price plus tariff if they are

dispose of all of their supply. Thus small states now enjoy the classic 'consumption efficiency benefit' of a tariff cut, well-known from basic trade theory; along with the classic 'production efficiency benefit' of such a cut.⁴ For the smaller states, then, the Federation customs union comes down to the benefits of classic tariff liberalisation combined with the costs of a deterioration in their terms of trade. The net effect of the cost and benefit is ambiguous.

Figure 2 brings out the ambiguity of the welfare impact of the federation customs union on the smaller states, by illustrating the possibility that the union will neither increase or decrease their welfare. Inspection of Figure 2 suggests two factors which will weigh against the tariff liberalisation benefit successfully cancelling the terms of trade cost endured by the smaller states: a low price elasticity of demand on the consumption side (increasing the curvature of the 'indifference curves'); and a low price elasticity of supply on the production side (increasing the curvature of the production possibility frontier).

⁴The opportunity cost of consuming rope, in terms of consuming steel and wool, had been exaggerated before 1902 by the small states' tariffs on rope; that opportunity cost is now less exaggerated, and so more advantageous decisions are made regarding the amounts of wool and steel consumed (ie less steel and wool). The opportunity cost of rope production, in terms of producing wool, had before 1902 been inflated by the small states' pre-Federation tariffs on rope; it is now less inflated, and more advantageous decisions are made regarding the amounts of rope and wool produced.

Figure 2: The Smaller States May Experience no Change in Welfare



And NSW? Like the smaller states, NSW suffers from a deterioration in its terms of trade subsequent to 1902. But unlike the smaller states, NSW's consumers and producers face an *increase* in rope price, on account of the introduction in 1902 of a 'national' tariff. But, as long as all rope is sourced from Victoria, the impact on NSW may nevertheless be simply analysed as an equivalent to a deterioration in its terms of trade. So New South Wales is worse off relative to pre-1902, regardless of whether rope imports from the rest of the world cease or continue.

To summarise over the possibilities: Victoria is unambiguously better off. The smaller states may be either better off or worse off, assuming Victoria satisfies all their rope imports. NSW seems unambiguously to have been made worse off by the federation customs union.

But must NSW be unambiguously worse off? Yes, so as long as NSW is a rope importer. But must NSW be a rope importer? If NSW was near saturation of its own market in rope before 1902, the rise in rope price might transform it into a rope exporter, and so like Victoria, the rise in the price of rope amounts to an improvement in its terms of trade. This improvement might be so large as to outweigh the cost of the tariff has through price distortions. Thus the possibility arises of the NSW being 'converted' into a second Victoria, and both larger states, benefitting at the expense of the smaller. The possibility is conveyed by Figure 4, which illustrates the possibility that the welfare of NSW is exactly unchanged.

The likelihood of this possibility may be doubted. The combined population of the smaller states was a little less than one third of Australia's states. This seems a small market to mop up rope exports of both NSW and Victoria.

Figure 3: New South Wales' Welfare Decreases Consequent to the Deterioration in its Terms of Trade

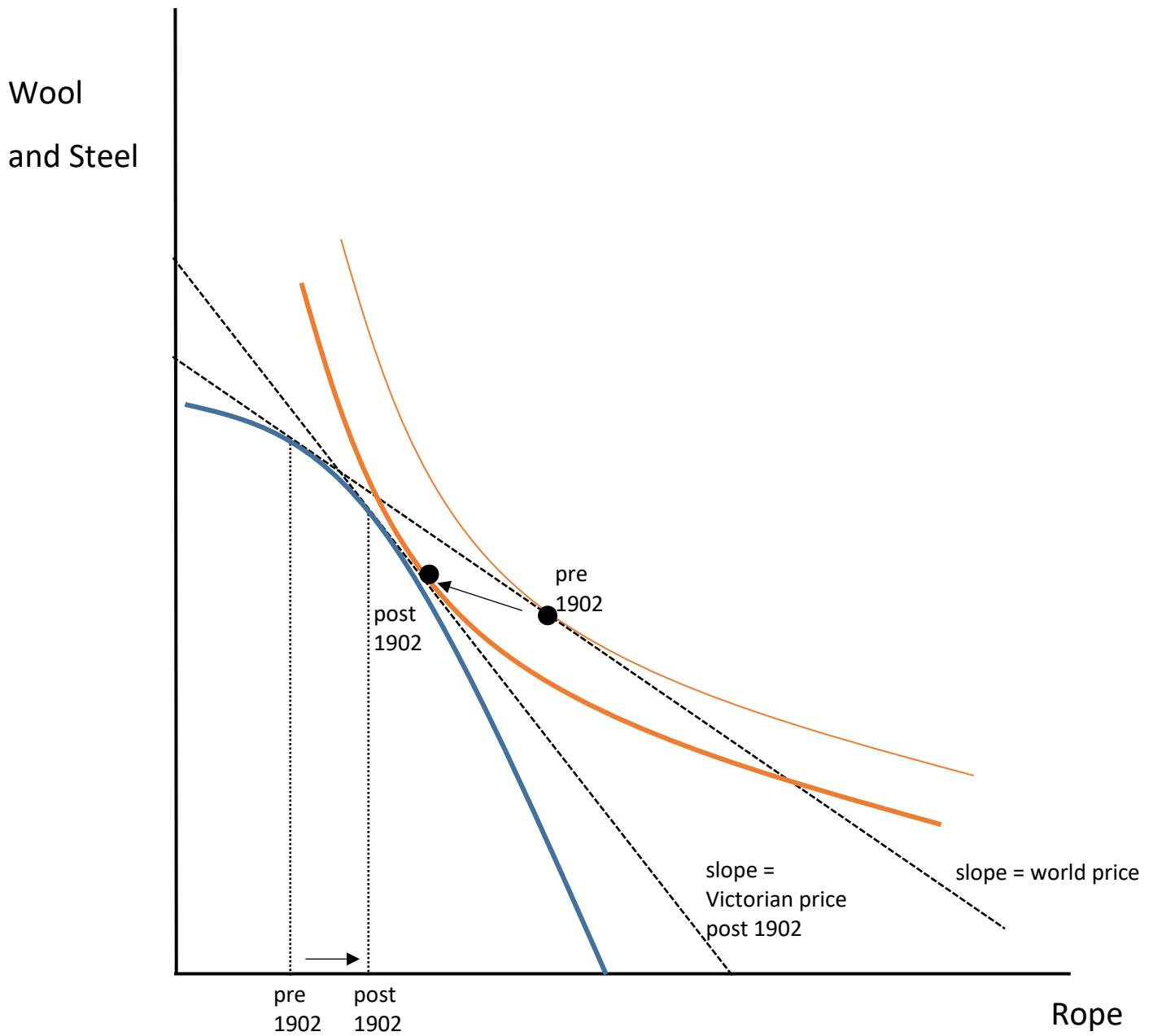
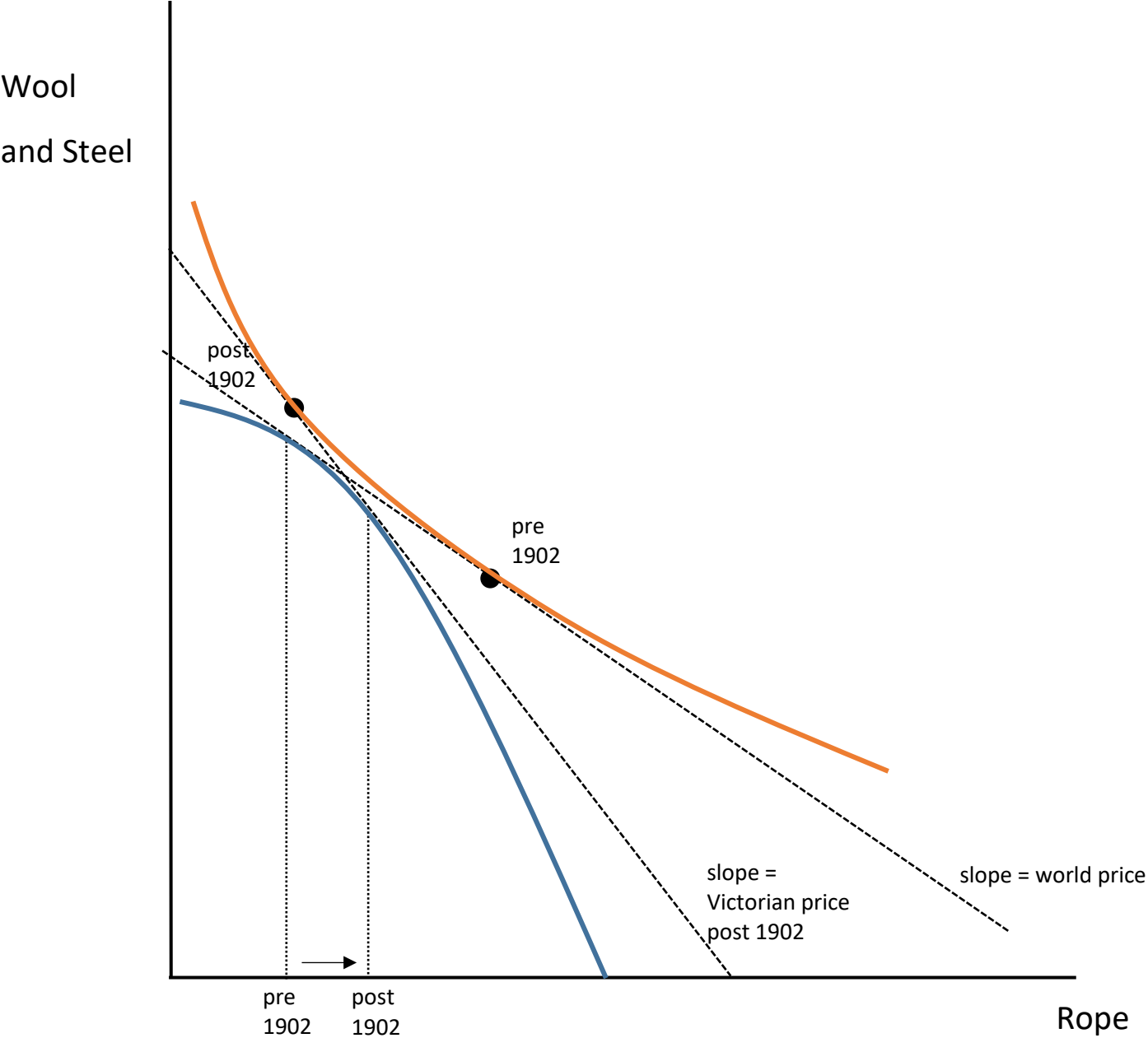


Figure 4: New South Wales' Welfare as Unchanged



III An Empirical Check

Can the story above be checked against observation? Welfare is not an observable. But the story above also makes predictions about trade patterns (eg Victoria's rope exports will increase), and these are observable. What happened to trade patterns, and how did they compare with what the model predicts?

Subjecting the model to empirical check is impeded by the fact that the *ceteris paribus* nature of the model's analysis assumes production possibility frontiers are unchanged, but, we may take it, they did expand between pre-Federation and post-Federation periods. Thus rather than simply looking at absolute quantities of imports etc, we need to 'scale' those quantities, to reflect the size of the economies at any point in time. One possible 'scaler' would be, in the case of exports, the total quantity of exports. Thus we would measure 'Victoria's exports to Australia' as Victoria's exports to Australia expressed as a proportion of Victoria's total exports. That is, as an 'export intensity'.

The first row of the table reports for each State the change in their total 'export intensity' with the rest of Australia, subsequent to Federation; that is, how the importance of their exports to other five states, relative to total exports, changed between 1896-1900 and 1905-09. The second row reports the change in each state's 'export intensity' to rest of the world. Rows three and four reports the corresponding changes in 'import intensities'.

Change in Trade Intensities of Each State, 1905-09 vs 1896-1900

(percentage points)

<i>Exports</i>	NSW	Vic	Qld	SA	WA	Tas
To the Rest of Australia	0.7	0.6	0	-0.2	-0.2	-0.1
To the Rest of the world	-0.7	-0.9	0.1	0.9	1.9	0.8
<i>Imports</i>						
From the Rest of Australia	-2.6	-3.1	2.6	1.2	-4.7	3.2
From the Rest of the world	-0.6	0.1	-0.7	-0.4	-0.1	-0.1

Source: all rows derived from Commonwealth Bureau of Census and Statistics 1911.

The first row indicates that, by the intensity measure, NSW and Victoria ‘exported more’ to the rest of Australia in the wake of Federation. The first row also indicates that the four smaller states did not ‘export more’ to the rest of Australia; three of them exported less. At the same time all four of the smaller states ‘exported more’ to the rest of the world. Further, row three indicates that the two largest states imported less from the rest of Australia; and row four reveals Victoria – ‘protectionist Victoria’ – actually strengthened the intensity of its imports from the rest of the world.

How to make out the changes reported in the table? Do they reflect systematic responses to the creation of the Federation customs union? Or are they just the

result of chance shocks? Can the model be successfully stretched over the pluses and minuses of the table?

The interpretation of the federation customs union advanced in Section II amounts to Victoria, with perhaps NSW in tow, making the other states a market for its excess production of rope, in place of the less remunerative world market. This interpretation seems to cohere with the top left cells of the Table. Those cells indicate in the wake of federation NSW and Victoria are exporting more to the remaining four states, and less to overseas markets.

The table's cells dealing with imports also cohere – or may cohere – with the paper's interpretation. That the table indicates Victoria's imports from overseas rose, while in all other states they fell, would seem to bespeak the rise in incomes in Victoria, and a fall in incomes in other states, which the model implies. On the other hand, the fall in imports of Victoria from the other states seems to present a difficulty for the paper's model.⁵ For in terms of absolute quantity, the model predicts Victoria's imports from the rest of Australia (consisting solely of wool) must rise: the rise in the price of rope in Victoria not only reduces her production of wool, it additionally implies price and income effects operate to increase her demand for wool. But the table indicates that Victoria 'imported less' from the other states. But recall the table actually reports an intensity; that is the *proportion* of Victoria's imports sourced from the rest of Australia. If we assume strong income effects with respect to steel (sourced from overseas), and only weak or negative income effects with respect to wool (sourced from the other states), then the proportion of Victoria's imports which are sourced from the other states might fall in the model, despite

⁵ NSW also records a fall in imports from other states. The negative income effect of the rise in the price of rope would fit with that.

the absolute quantity increasing. That possibility coheres with the table's indication that smaller states increased their 'export intensity' to the rest of the world.

Like Victoria, the table indicates NSW also 'imported less' from the rest of Australia. It is to be expected that NSW would import less rope in total – a tariff has increased the price of rope. On the other hand, Victoria has increased its export of ropes to the rest of Australia. It is possible that these two countervailing effects would net out so that NSW imports of rope from the rest of Australia increase. But it is also possible they would net out so that NSW imports of rope from the rest of Australia decrease. Thus the fall in 'NSW imports of rope from the rest of Australia' indicated in the table is reconcilable with the model.

IV Relaxations and Extensions

The key premise and principal novelty in the paper's stylisation of the Australian economy at the opening of the 20th c is that it supposes 'protectionist Victoria' to be not actually protectionist. Victoria, by the period in question, is assumed to be an exporter of rope, and had no tariffs on what she imported, steel and wool. How might relaxations in these assumptions affect the conclusions?

Allowing for a Victorian tariff on her wool imports will not alter the conclusion that the federation customs union benefitted Victoria, harmed NSW, and may have either harmed or benefitted the rest of the country. As far as Victoria is concerned, the abolition of any tariff on wool will simply add a classic tariff liberalisation benefit to Victoria's terms of trade benefit. And assuming the price of 'wool' is set by world markets, there will be no improvement in the price of 'wool' exports from the rest of Australia to Victoria consequent to the customs

union. Thus the analysis for the rest of Australia is also unchanged by the allowance of a tariff on wool before 1902.⁶

Allowing for a tariff on steel before 1902 (at least outside of NSW) will also not alter qualitatively the paper's conclusions, even if some steel is produced in Australia. Since, in the analysis, the price of wool and steel are unchanged by the Federation customs union in Victoria and the four smaller states, for these regions the vertical axis of the figures in Section II can, with respect to the production possibility frontier, be reinterpreted as 'dollars worth of steel and wool produced'. Thus the analysis Victoria and the four smaller states would proceed just as it did in Section II, and with the same conclusions. In NSW any allowance for a steel tariff in Victoria etc simply means the price of steel in NSW is increased by the customs union, thanks to the 'national' tariff post-1902; but this simply adds a tariff illiberalisation cost to NSW's burden.

Scrutiny is also required of the assumption that the 'national' tariff imposed in 1902 equals in the size the tariff imposed by Victoria and the four smaller states before 1902. What if the 'national' tariff is imposed at the Victorian rate, but the Victorian rate exceeded the rate on the smaller states? Then the smaller states still suffer a terms of trade deterioration, but might additionally suffer an increase in the prices their consumers and producers face; a potential tariff illiberalisation burden now appears for the smaller states.

A final possibility that merits exploration is that NSW was a rope exporter at the opening of the 20th c, like Victoria. NSW now becomes 'another Victoria' in terms of its terms of trade: the price of its exportable rises subsequent 1902.

⁶ It may be retorted that to assume the price of 'wool' is set by world markets is plausible if 'wool' was actually wool, i.e the fleece of sheep. But if 'wool' also included livestock – which it did - it would be less plausible

But (unlike Victoria) NSW will still experiences a tariff illiberalisation burden. It will not be quite 'another Victoria'.

The rationale of the paper's analysis dissolves if Victoria is not assumed to an exporter of rope by 1902. If Victoria is a rope importer, like the rest of Australia, then the federation customs union becomes a non-event for all states, save NSW. There was no internal trade in rope (or steel) before the customs union; and there is no internal trade in these after the customs union either. Nothing happens. NSW, however, now experiences a tariff illiberalisation burden with respect to rope. Welfare potential declines in NSW, and is unchanged in the remainder of Australia.

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