Do good institutions result in good trade policy? 
The evolution of tariff protection in the colony of Victoria 1880-1890.

Martin Shanahan and John K. Wilson
University of South Australia
Centre for Regulation and Market Analysis

Paper presented to the
Asia-Pacific Economic and Business History Conference 2011
18-20 February 2011 Berkeley, California

Draft: Please do not cite

Abstract
Trade protection can be modelled as a function of lobby group influence. Within this framework research suggests that communities with good institutions and less influence from special interest groups, may still tolerate protection, but only on goods and sectors generating positive externalities. Between 1860 and 1900, the Australian colony of Victoria introduced a series of tariffs, initially to raise revenue, but later to protect industry. This paper examines tariff rates in specific industry sectors of Victoria in 1880 and again in 1890, after the 1881 Royal Commission on Tariffs to see whether: the Royal Commission sought to protect growth enhancing sectors; sectors which exhibited high levels of value added, or marginal productivity in 1880 were subsequently protected in 1890; and if the final tariff outcomes were in line with the Commission’s recommendations.

The paper builds on earlier research (Wilson and Shanahan, 2009, 2010), that found, despite having relatively good institutions, Victoria protected low value sectors. Using details from the Royal Commission, we seek to uncover whether Victorian trade policy was targeted towards growth enhancing sectors or whether in the case of Victoria at least, the final pattern of tariff protection was the result of a more complex, and less transparent process.

Keywords: tariffs, protection, lobbying, growth

JEL codes:

Acknowledgments: We would like to Jeff Williamson and participants at the Madrid workshop for initial comments that assisted in the development of this paper and Brendan Shanahan for research assistance.
Introduction
Trade protection is frequently modelled as a function of lobby group influence (Grossman and Helpman, 1994). This approach suggests that in a small, open economy, the primary explanation for deviations from optimal free trade is a government that is prepared to trade off the welfare of citizens for political contributions from those who gain from protection. The susceptibility of government to be swayed by contributions relative to their concern for welfare has generally been modelled as exogenous, with the weight ascribed to citizens interpreted as a measure of institutional quality. Nunn and Trefler (2006) extended this approach to account for one of the traditional explanations of optimal positive tariffs; the existence of production externalities. Incorporating this into the Grossman and Helpman framework yields the result that governments may tolerate positive protection in the absence of lobbying pressure, but only on goods (and thus sectors) generating positive externalities. It follows that countries which have relatively weak institutions and are responsive to lobbying by special interest groups are more likely to protect ‘low value’ sectors of the economy, while those with better institutions will be more likely to protect ‘high value’ or growth enhancing sectors. Support for these predictions was given by Tena-Junguito (2010) who, using data from 32 countries in 1876 found that those with ‘good’ (democratic) institutions were the most likely to protect sectors associated with positive externalities (growth enhancing industries).

Between 1860 and 1900, the Australian colony of Victoria introduced a succession of tariff bills. Initially these were aimed at revenue raising, but by the 1870s these were essentially protectionist in nature. This paper examines tariff rates in specific industry sectors of Victoria in 1880 and again in 1890, after the 1885 Royal Commission on Tariffs.1 We assume that a Royal Commission, while open to representations from special interest groups, is sufficiently transparent in its deliberations and decisions to represent a good institutional process for policy formation. From this premise we ask, is there evidence that the Royal commission sought to protect growth enhancing sectors; or if sectors which exhibited high levels of value added, or relatively higher marginal productivity in 1880 were subsequently

1 In all discussions, and consistent with much of the literature in this area, the focus is on nominal rather than effective tariff rates.
protected in 1890; or whether the final tariff outcomes were in line with the Commission’s recommendations?

Our paper, which builds on earlier time series analysis (Wilson and Shanahan, 2009, 2010), examines the assumption that democracies with good institutions were able to ‘resist’ the poor trade policy outcomes associated with lobbying. Using a detailed Royal Commission, we seek to uncover the rationale behind Victorian trade policy and assess whether tariffs were targeted towards growth enhancing sectors or whether in the case of Victoria at least, the final pattern of tariff protection was the result of a more complex, and far less transparent process.

Theoretical background.

There are different approaches to analysing the relationship between lobby groups and policy outcomes.\(^2\) One of the standard models of endogenous trade protection is that produced by Grossman and Helpman (1994). Their model has received substantial empirical support.\(^3\) In its simplest form, the model assumes special interest groups are able to influence policy decisions by making political contributions to government. Specifically, government welfare is comprised of two components: campaign contributions and aggregate societal welfare. The nature of such contributions can range from funds for election campaigns to payment for policy outcomes (i.e a form of ‘bribe’).\(^4\) Aggregate societal welfare reflects that governments need the support of citizens to remain in power. The relative weight of each component of government welfare is determined exogenously. In the model, special interest groups offer policy contingent contributions to government who then set policy. A key result is that in a small open economy, positive tariff protection will be offered to all organised industries who make contributions, even though this policy will lower aggregate welfare.\(^5\) The distribution of surpluses and the extent to which trade policy will deviate from free trade is dependent on characteristics of

---


\(^3\) See for example, McCalman (2004), Gawande et al. (2000)

\(^4\) Any political contribution made with explicit or implicit expectation of a favour in return can be considered as a form of bribery. In most developed economies, contributions which are in anyway contingent on policy are illegal.

\(^5\) One exception is in the unlikely case where all citizens are politically organised. In such a case, political contributions simply convey the preferences of all citizens (those benefiting from protection and those who stand to lose). Hence, free trade outcomes emerge, although, lobby groups pay for this outcome.
each protected sector, such as the relative elasticity of import demand and import penetration, the level of competition between rival lobby groups, and the exogenous weight ascribed by government to aggregate welfare vis-à-vis contributions from special interest groups. In its simplest form, Grossman and Helpman’s model presents a picture of deviations from free trade which arise due to lobbying.

Nunn and Trefler (2006) make a simple yet crucial extension to this framework. They allow for the possibility of an externality so that the government’s objective function becomes a weighted sum of sector specific externalities, aggregate welfare, and sector specific contributions. Intuitively, the model allows for the possibility that the costs of protection may be offset by positive externalities.\(^6\) More formally, the original specification of the government’s objective function under Grossman and Helpman (1994) is:

\[
G = \sum_{i\in L} S_i(p) + aW(p)
\]  

(1)

Where \( S \) denotes contributions from each organised lobby group \( i \), and \( W \) is the aggregate welfare of citizens. Both contributions and welfare are contingent on the price to be paid which in turn is determined by the level of protection (\( \tau \)) in each sector. In this case we consider a tariff in a small open economy such that \( W'(\tau) < 0 \) – the change in welfare due to protection is negative. The exogenous weight ascribed to welfare as opposed to contributions is given by the parameter \( a \).\(^7\) Allowing for the possibility that a sector may generate externalities which enhance growth, the government’s objective function in (1) is rewritten as:

\[
G = \sum_{i\in L} S_i(p) + aW(p) + bG(x(p))
\]  

(2)

The term \( G(x(p)) \) denotes the benefit to the economy from domestic production (\( x \)) in the externality generating sector. The weight \( b \) captures the relative importance of

---

\(^6\) Negative externalities are also possible. Hence, one could more broadly state this as the costs of protection being offset by positive externalities or that these costs are exacerbated where negative externalities occur.

\(^7\) Aggregate welfare is made up as the sum of all agents in the model, including lobby groups. Hence, organised lobbies receive a weight of \( 1+a \).
this spill-over benefit to welfare. The optimal tariff in such a structure satisfies a local truthfulness condition such that the marginal change in welfare to organised lobbies from a policy change is equal to the marginal cost in terms of political donations in procuring that change. From Theorem 1 of Nunn and Trefler (2006), the optimal tariff in sector \( i \) will satisfy the requirement that:

\[
\tau_i = \frac{I_i - \alpha_L}{a + \alpha_L} \cdot \frac{q_i(p_i)}{x_i(p_i)} + \frac{b + \gamma_L}{a + \alpha_L} G_i'(x_i(p_i))
\]

(3)

where \( I \) is an indicator variable for each sector \( i \) taking on a value of one if the sector is politically organised and zero otherwise. The symbol \( \alpha \) represents the fraction of the total population represented by an organised lobby and \( \gamma \) the proportion of benefits from the externality producing sector that accrues to these individuals. The industries can be ranked in the order they generate externalities such that industry \( i \) generates greater positive externalities than industry \( i-1 \). Hence, \( G_i' > G_{i-1}' \).

The effect of changes in the weights ascribed to aggregate welfare have been shown to be a function of institutional factors such as the level of democracy, the extent of rent seeking and levels of corruption. Direct differentiation of (3) and rearrangement yields:

\[
\frac{d\tau_i}{da} = \frac{-\tau}{a + \alpha_L} < 0 \quad \forall \tau > 0 
\]

(4a)

\[
\frac{d\tau_i}{db} = \frac{G_i'}{a + \alpha_L}
\]

(4b)

Note that (4a) is unambiguously negative for any positive level of tariffs. Hence, as the weight ascribed to aggregate welfare rises, the tariff will fall closer to the welfare maximising level. This effect is greatest when the tariff is large, the proportion of the population represented by a lobby is small or when the starting point for the

---

8 The model is not formally presented here. The conditions for equilibrium are set out in Bernhard and Whinston (1986).

9 See for example, Wilson and Damania (2005) who endogenise the weight ascribed to aggregate welfare as a function of political competition. Empirical work by Nunn and Trefler (2006) and Tena-Junguito (2010) also make the assumption that government will place a higher weight on aggregate welfare vis-a-vis political contributions when democracy is high and corruption is low (among other indicators).
weight on aggregate welfare is small. Hence, when conditions are favourable to lobby groups (low $a$ and low $\alpha_L$) tariff policy shifts from a change in government preferences will be large. In a stable democracy, the conditions necessary for this outcome to hold are unlikely.

The effect of (4b) depends on the sign of $G'$ which is unrestricted.\textsuperscript{10} To see the effect more clearly, recall the ordering condition whereby the positive external benefits generated by sector $i$ are greater than sector $i-1$. If we assess the impact of changes of the weights $a$ and $b$ on differences in tariff rates for the two sectors we derive:

\begin{align}
\frac{d(\tau_i - \tau_{i-1})}{da} &= \frac{-\tau - \tau_{i-1}}{a + \alpha_L} > 0 \quad \forall (\tau_i - \tau_{i-1} < 0) \quad (5a) \\
\frac{d(\tau_i - \tau_{i-1})}{db} &= \frac{G'_i - G'_{i-1}}{a + \alpha_L} > 0 \quad (5b)
\end{align}

Equation (5b) identifies that with larger externalities accruing from domestic production in sector $i$ than sector $i-1$, a higher value placed on positive externalities to the economy will induce a higher differential between tariff rates in the two sectors. Tariffs will be raised more in the sector yielding the highest positive externality.\textsuperscript{11} Equation (5a) also demonstrates that a change in the weight on general aggregate welfare will result in a similar wedge between tariffs in the two sectors. Hence, while the traditional model predicts that higher weights on aggregate welfare will see a reduction in tariffs in a small open economy, the introduction of externalities delivers the possibility that high tariffs could be sustained. The two conditions necessary for free trade are the existence of positive externalities and good institutions.

Testing this model empirically, we would expect that tariffs in countries with good institutions would generally reveal a preference towards goods which are likely to generate positive externalities. Nunn and Trefler examined 17 sectors in 59 countries over the period 1972-2000.\textsuperscript{12} Externality generating sectors are identified as having a disproportionately high level of skilled workers. Their results, which

\textsuperscript{10} Externalities can be positive or negative.
\textsuperscript{11} For a positive externality, $G' > 0$. The intuition for the result holds for negative externalities provided $|G'_i| < |G'_{i-1}|$.
\textsuperscript{12} Nunn and Trefler (2006) used educational status to delineate between sectors generating positive externalities and those that did not.
controlled for institutional quality, indicated that the skill bias of tariffs was positively associated with economic growth, implying that only when tariffs are applied to high skill sectors do they have a positive effect on growth. The authors concluded that countries with good institutions are able to overcome problems associated with lobbying and protect the ‘right’ industries, while those with poor institutions protect low value, non-growth enhancing industries.

Tena-Junguito (2010) conducted a similar analysis for 1876, using data for 32 countries across 25 industrial products and showing that protection was welfare enhancing for the ‘rich club’ where institutional quality was generally better. The results, however, were not robust if settler economies were excluded, a result which he argued were due to these economies using tariffs for collecting revenue rather than for protection. The results also suggested that institutions were generally important not directly, but indirectly, via their effect on the tariff structure.

**Previous Empirical work on Victoria.**

Wilson and Shanahan (2009) initially examined Victorian tariff data for 1880 using the simple Grossman-Helpman framework to detect whether there was empirical evidence of the influence of lobbying that impacted on the shape of Victoria’s tariffs in that year. As Table 1 shows, tariffs varied markedly between sectors: the median tariff rate was 14 percent, and while some sectors enjoyed zero tariffs (for example, wool, coal, and surgical instruments), others such as beer (102.2 percent) and tobacco (101.4 percent) had large duties imposed. Agricultural products, which have traditionally been accepted as not the target of tariff policy can be found at either end of the spectrum (wool had a zero tariff while ‘other agricultural’ and vegetable products had tariffs of 86.5 and 28 percent). There seemed to be some correlation between the size of domestic production and the tariff. In particular, the correlation coefficient between average sectoral tariffs and domestic output was -0.13. On the one-hand, this indicated that higher tariffs were levied on smaller industries, perhaps consistent with an ‘infant industry’ argument. This might have particularly been the case in 1880 if tariffs had not yet fully enabled protected industries to reach their full potential. On the other hand, one would expect protected industries to be those that

---

13 Tena-Junguito (2010) used the real wage as a proxy measure for sectors generating positive externalities compared with those that did not.

14 Data on domestic production taken from Siriwardana, 1985, page 126.
which have some significant domestic output and are likely to be those which would be more successfully in lobbying for protection.

Fortunately the variation in tariffs provided an opportunity to consider some of the possible explanations for the between-industry variance in rates. The traditional literature has largely viewed tariffs as being either revenue raising or protective of infant domestic industries. The revenue raising hypothesis would predict higher tariffs applied to those sectors whose goods had inelastic import demand, however, such a result could also be consistent with lobbying. Table 2 presents average tariff levels and various measures of import demand elasticity. Simple correlation coefficients between average tariffs and each series of estimates for the elasticity of import demand (absolute measure) are: Stern et al (1976) -0.09; Shiells et al. (1986) -0.09; Sawers (1988) -0.23; and for price elasticity estimates (Siriwardana) -0.43. These correlations suggest that goods which were unresponsive to price changes were those which received higher tariffs, consistent with expectations in terms of both income maximisation and lobbying models.

A first empirical estimation of the Grossman Helpman model for Colonial Victoria

In its simple form, the Grossman Helpman model predicts that in equilibrium, the tariff chosen by the government satisfies the following:

\[
\frac{t_i}{1+t_i} = \left( \frac{L_i - \alpha e_i}{a + \alpha L_i} \right) X_i \frac{1}{M_i e_i}
\]

(6)

Where X/M represents and inverse import penetration level and e the import elasticity of demand. Tariffs will be greater on articles with inelastic import demand elasticity and where the import penetration is low. Intuitively, in both cases the costs on aggregate welfare through a deadweight loss are lower and hence lobbying is more effective.

Equation 6 can be modified to a form suitable for econometric estimation:
\[ \frac{t_i}{1+t_i}e_i = \beta_1 \frac{X_i}{M_i} + \beta_2 I_i \frac{X_i}{M_i} + \epsilon_i \]  

(7)

where:

\[ \beta_1 = \frac{-\alpha_L}{a + \alpha_L} \]

\[ \beta_2 = \frac{1}{a + \alpha_L} \]

Thus the coefficients \( \beta_1 \) and \( \beta_2 \) are both ultimately dependent on the proportion of the population that is politically organised (\( \alpha_L \in (0,1) \)) and the weight the government gives to aggregate welfare (the value of \( a \)). Given that both \( a \) and \( \alpha_L \) are positive, the expectation is that \( \beta_1 < 0 \) and \( \beta_2 > 0 \). Moreover, the model predicts that \( \beta_1 + \beta_2 > 0 \). Hence, our initial exploration into this model and a potential link with 1880 Victoria is to check to see if the estimated parameters are consistent with these expectations. Simple OLS regression output is presented in Table 3.

Insert Table 3 about here.

The results in table three are consistent with the expected signs of \( \beta_1 < 0 \) and \( \beta_2 > 0 \) for all regressions apart from \( \beta_1 > 0 \) in the specification using elasticity values from Sawyer (1988). This provides some support for the notion that positive protection was offered to industries that were organised (as detected by our measures), and that the relationship between the import penetration ratio and protection does indeed turn crucially on whether or not an industry was organised.\(^{15}\) There was little support for the hypothesis that \( \beta_1 + \beta_2 > 0 \), other than in specification c.\(^{16}\) The final conclusion was that there was some weak, but positive support for the notion that lobbying did have a role in influencing tariff protection in Colonial Victoria.

**Estimating Nunn and Trefler’s model for Victoria**

\(^{15}\) An industry dummy was created to indicate whether it was politically organised. Those with per worker surplus greater than the mean were denoted as organised. This cut-off point is somewhat arbitrary. An alternative cut-off of the mean plus one standard deviation yielded similar results.

\(^{16}\) There are likely to be endogeneity problems in this specification.
Given these initial tentative findings from applying the simple Grossman Helpman model, Wilson and Shanahan (2010) examined the structure of tariffs for the years 1875, 1880 and 1890. They also extended the original question, following the work of Nunn and Trefler (2006) and Tena-Junguito (2010) and asked whether the variation in Victorian tariffs could be explained by the observation that the government had tolerated tariffs on sectors that were growth enhancing, or whether the tariff variation found in Victoria was more consistent with the outcomes expected from successful special interest groups protecting their own interests. To measure growth enhancing sectors more directly, the study also used a more comprehensive data set than those provided by Siriwardana (1985), incorporating a greater number of sectors (approximately 80 sectors with over 500 goods), and for each sector, detailed information relating to the nature of production. For example, on the proportion of factories using steam, labour, horse, and water power over the period, as well as the value of land, the value of machinery, plant and buildings that were recorded separately for each enterprise, and the ratio of female to male workers. The results, reported in Tables 4, 5 and 6 suggested that the tariff structures was consistent with the influence of lobby groups rather than objective measures of sector capacity or technological uptake.

The results suggested that there is little evidence that Victoria followed a path consistent with the protection of sectors with positive externalities. It has been argued that the path of protection in Victoria was ad hoc and that protection did little to support industrial development (Siriwardana, 1985; Boot, 1998). These results suggested that industries using the leading technology of the time (steam) and with high capital intensity were less likely to be protected. These results are consistent with the first study and again suggest that tariffs may have been a function of special interest politics.\footnote{While consistent, these results are again tentative. For example, such results may bring into question the nature of how to best measure externalities. Our view is that in the long-run, the most likely gains from any production process would be the productivity increases which are derived from the use of new capital. We see little evidence of this in our results. But data and measurement issues still make these findings tentative.}

Insert tables 4, 5 and 6 about here.
However consistency is not equivalent to accuracy. To try and examine this question more closely we use the opportunity presented by the public record and the Royal Commission on Tariffs held in 1881 to ask if there is evidence that the Royal commission sought to protect growth enhancing sectors; or if sectors which exhibited high levels of value added, or relatively higher marginal productivity in 1880 were subsequently protected in 1890; or whether the final tariff outcomes were in line with the Commission’s recommendations?

The historical context of Colonial Victorian tariffs
Tracing the development of tariffs and tariff policy is complex in practice.\textsuperscript{18} In colonial Victoria, calls for tariff protection began in the early 1850s, and within 10 years the Victorian Association for the Protection of Native Industry and the Tariff League of Victoria had been formed. In the early 1860s a government Select Committee on the Tariff heard from a wide range of small manufacturers who complained about the ‘undue competition’ from imported goods. While it was true that local producers were disadvantaged in the market in comparison to imports, this was mostly the result of producing goods of higher price and lower quality than their imported competitors.

The initial motivation for government customs duties had been for revenue raising, and even changes made in 1862 apparently paid little heed to public petitions and manufacturers’ lobbying.\textsuperscript{19} By the mid 1860s, however, another Select Committee, this time on Manufacturers, began to note the association between differential duties (especially in tobacco and spirits) and variations in capital investment, employment and consumer prices. This period saw a complete muddle in tariff policy, including a particularly farcical period in the mid 1860s where a dispute between the lower and upper houses of parliament meant tariff rates were twice substantially revised, twice declared illegal and the collected revenue returned to businesses. By 1866, however, some decorum had returned and a new tariff regime was established. This legislation widened the range of commodities subject to duty, and some commentators argue that it was at this point that tariff protection became

\textsuperscript{18} The history of tariff protection in Victoria and New South Wales is documented in, Coghlan (1918), Allin (1918); Patterson (1968) among others. This section leans heavily on Linge (1979) and Coghlan (1918).

established as a principle of trade policy, even though the rates themselves were not particularly high.\textsuperscript{20}

By 1867 still more new duties meant almost all imports except raw materials were subject to tariffs, and net government revenue from this source trebled from 6.2 per cent in 1866 to 18.7 per cent in 1869.\textsuperscript{21} Further changes in 1871 kept the government’s income from duties at roughly this proportion of total revenues, but by now it was suggested that the lower rates of 10 percent were levied on goods subject to further value adding while rates of 20 percent were on finished goods. Coghlan (1918, p1152) highlights this Bill as marking the definite acceptance of protection as a motive for tariff duties. Minor ‘shuffling’ of rates occurred several times in the 1870s until ‘harsh’ increases were introduced in 1879 when most items previously subject to 10 percent tariffs went to 20 percent, and those on 20 to 25 percent. By 1886-87 over a quarter of government revenues were derived from tariffs.\textsuperscript{22}

Predictably, the constant alternations to rates were accompanied by different enquiries, the most important being the 1881-83 Royal Commission on the Tariff. Linge (1979) speculates that recommendations aimed at lessening the difficulties for some secondary industries lay behind the otherwise confusing changes to the tariff rates which occurred later in 1888-9. The Board of Inquiry into the Fiscal System held over a decade later (in 1895) concluded:

\begin{quote}
A large number of the duties are partly fiscal and partly protective. Some duties levied for purely fiscal purposes have fostered home manufacture, and so become protective; whilst others levied for protective purposes have failed in their object and become purely fiscal. The difficulties of classification are enhanced by the fact that the principles that guided the Legislature in making the Tariff are now somewhat obscured.\textsuperscript{23}
\end{quote}

\textsuperscript{20} Coghlan (1918), Chpt VIII vol II. See also Linge (1979) p 245. An additional complication, however, is the observation that government revenue from land sales, rents and fees were declining, and custom duties were more easily increased than income from railways, water post and telegraphic services.

\textsuperscript{21} Linge (1979) p 246

\textsuperscript{22} Linge (1979) p247

\textsuperscript{23} Board of Inquiry into the Fiscal System (Second Report p xiii) 1895 quoted in Linge (1979 p 248). One important note from all this is that the sometime simplistic demarcation of tariffs, into those aimed at ‘revenue raising’, compared to those protecting ‘infant industries’, or the result of rent seeking is problematic. Politics is always about compromise and the introduction and justification of tariffs, particularly given their distributional consequences is an area where such political trade-offs occurs frequently. Furthermore, the rationale for such policies, as well as the interest groups that support them, changes over time.
The contemporary debates about tariffs include most of the current day arguments. The initial rationale was to retain labour, particularly the labour that had flowed into the colony with the 1850 gold rushes. This argument found support among workers, small manufacturers and land owners, the latter group also enjoying lower taxes on land sales as a result. Labour retention also complemented the case for ‘infant industry’ protection. Given the comparatively small scale of manufacturing in Victoria at this time, tariffs it was argued, also assisted in creating firms with economies of advancing sectors that employed more labour. As agriculture did not enjoy these same economies, protecting manufactured goods would enhance labour demand. Perceptions about the cheapness and quality of imported goods (especially those from the UK and by the end of the 19th century the USA) also saw tariffs as one form of national protection. Tariffs were a temporary impost for long-term colonial and national gain.

Over time the arguments for tariffs became more sophisticated. It was noted that tariff protection also meant a shift in income toward wage earners. By early in the 20th century it was argued that protecting import competing industries increased demand for labour in those industries. This in turn supported employment (and if minimum wages were also guaranteed – something that occurred after 1911), attracted migrants. Given the support for tariffs by land owners in the 1870s it is interesting to note that by the 1920s tariffs were seen as one means of indirectly taxing large (rich) landholders.

This combination of shifting theoretical rationales and lobbyists (both for and against), when mixed with the ‘real politic’ of political comprise, means identifying the influence of special interest groups on tariff protection is not straight forward. Nonetheless, the open public discussion on tariffs combined with a relatively transparent Royal Commission and a parliamentary system should mean that relative

---

24 An additional factor was the fall in transportation costs that occurred in the second half of the 19th century. Increasing tariffs, to some extent off set this fall in costs and helped maintain cost relativities. (See Findlay and O’Rourke, 2003, p 39-40).

25 Brigden (1929). Variations on these arguments persisted for many years. Even deep into the 20th century tariffs were seen to protect employment (especially in periods of depression or post war) and assist in promoting ‘balanced’ and more ‘stable’ growth in the economy. Tariffs could thus assist in developing industries less subject to fluctuations than those in the primary sector as well as assist Australia to join the industrially-advanced club of nations. See also Kenwood (1995): pp 66-68.

26 As a singularly spectacular example, see the compromise tariff structure imposed at Federation (after pro and anti tariff colonies combined ). The resulting scheme, that was introduced into the Australian parliament in 1901 ‘satisfied no-one’ (Kenwood p 69). Hardly a form of tax structure that lends itself to easy analysis and correlation with supporting interests.
to other institutional systems, the policy setting process in colonial Victoria was relatively good and the opportunity for successful rent-seeking comparatively low.

**The Royal Commission**

The Royal Commission on the Tariff reported on 20 September 1881 after taking evidence from 548 witnesses at more than 150 sittings held all over the colony of Victoria. Twenty two commissioners were appointed, all charged with the task,

…to inquire and report upon the incidence and working of the present Customs Tariff … especially with regard to the continued inclusion therein of items which, while neither yielding any considerable amount of revenue not adequately protecting and Victorian industry, at the same time seriously hamper the operation of trade…. 27

All sittings were open to the public, and reported daily in local newspapers. The chairman was involved in 195 meetings, and six of the commissioners participated in over 100 meetings each. The average number of sessions attended by a commissioner (including factory inspections and country sittings) was 83. 28 All evidence given by witnesses was given under oath and subsequently published. A further 50,000 questionnaires were distributed around the colony and the survey answers collected. 29 Reports from the UK and a ‘recent investigation’ into tariffs in the United States were also collected. The final report was published in six divisions with 18 separate sectional reports (on tariffs in specific industry sectors), 8 major sections of recommendations and 28 appendices. 30 It represented a major, transparent effort to thoroughly investigate the impact and effect of tariffs in colonial Victoria.

Despite these efforts, however, it is also clear that not all witnesses’ evidence was received equally. The record frequently refers to ‘important witnesses’, or names individuals as ‘association representatives’. Reading the reports it appears too that the standing of individuals (designated by company position, or company ownership,

---

27 Royal Commission 1882, pp. ii.
28 Source Appendix B. Mean attendance figures excludes R de Bruce Johnstone ESQ MP who died two months into the inquiry.
29 Unfortunately the overall response rate is not reported. The Report (page ix) states ‘a fair proportion of replies was received’. Appendix V (p 134) reports that 23.9% of the 17,892 questionnaires distributed to the ‘agricultural and pastoral classes of Victoria’, were returned.
30 The Commission recommended abolishing tariffs on 141 goods (which we have matched to sectors where possible), decreases for a further 18 goods, new tariffs or increases for 14 goods, and a series of administrative definition changes)
or by trade) if not directly influential, carried weight with the commissioners. Nonetheless, on certain matters individual commissioners were sufficiently independent to dissent from the majority recommendations.

A later commentator suggests that the resulting post 1882 tariffs had serious complications and inconsistencies, with the principles underlying the system becoming ‘incomprehensible’.\(^{31}\) In particular, he identified the problems associated with effective (as opposed to nominal) tariff rates, and their impact on the price of intermediate goods. Other factors too were it play. Linge quotes evidence from (another) Board of Inquiry held in 1895.

It is an established fact that such goods [imports] are, as a rule cheaper to the public than they were before the imposition of such duties and that recent increases in rate have not, except in isolated cases, been followed by corresponding increase in price to the public. Various causes have, no doubt, combined to bring about this result, but the most potent factor has undoubtedly been the breaking up of rings or monopolies of importers.\(^{32}\)

Despite this rather pessimistic view that identifying the impact of tariff changes is all ‘too hard’ the next section examines the recommendations and outcomes of the Royal Commission more closely. Despite the myriad of complications, the aim is to assess whether it is possible to detect whether tariffs and tariff changes were targeted towards growth enhancing sectors. The data used here were taken from the Royal Commission itself, or from Victorian Parliamentary Papers.

**Results and Discussion**

Tena-Junguito (2010) identified a number of sectors that he considered were ‘growth enhancing’ and non growth enhancing in 19\(^{th}\) century economies. Table 7 matches the goods recommended for free trade by the Royal Commission with these categories. The results suggest that the Commissioners recommended the removal of tariffs on a wide range of goods in sectors that Tena-Junguito associated with both high and low growth. This first look, therefore, does not reveal a clear cut bias either toward or away from sectors with growth enhancing externalities.

---

\(^{31}\) Linge, 1979 p 260.  
\(^{32}\) Quoted in Linge, p 261.
An obvious problem with this mapping, however, is that the ‘match’ between our categories and those of Tena-Junguito is relatively imperfect. \(^{33}\) Such an aggregative approach not only opens the possibility of mismatches, it also potentially obscures key industrial sectors that lay ‘underneath’ the aggregate. For example, Tena-Junguito identifies ‘machines tools and implements – manufactures’ as one key sector associated with growth enhancing externalities. We approximate this with the Victorian industry sectors ‘agricultural implement manufactures’ and ‘engine machine manufacturers’. This aggregation does not, however, reveal whether perhaps, the ‘real driver’ of growth externalities was machine tool engineering – a category that neither Tena-Junguito or we can identify separately. \(^{34}\)

The Royal Commission was comparatively rich in specific data. This aggregative approach does not approach utilise all of the data, or the information relating to production and production processes, which we hold for each sector. We thus sought to use a more disaggregated approach to examine the link between the Royal Commission’s recommendations and the ultimate tariff structure in Victoria in 1890. \(^{35}\)

Tables 8 to 15 presents data on 30 goods the Commissioners recommended should have zero tariffs, as well as the actual 1880 tariff rates (pre-commission) and the 1890 post-commission rates. Table 8 thus reveals whether, for these 30 goods at least, the 1890 rates were in line with the Royal Commission’s recommendations. The results suggest that in almost every case the Royal commission’s recommendations were not followed, and that in all but six cases, tariff rates were actually higher in 1890 than in 1880. The average tariff rate in 1880 for these goods was 0.187 while in 1890 it was 0.216. Table 9 attempts to get closer to the notion that growth externalities in particular sectors may have been, perhaps directly, influential on the Commissioners. We do this by identifying the proportion of the industries in each sector that were powered by steam, water, gas, horse power or

\(^{33}\) Proxies used to match goods with sectors appear in Table 17.

\(^{34}\) This also begs the question whether the ultimate growth driver is not machine tool engineering but the human capital required to create this sector. We return to this issue later in the paper.

\(^{35}\) Naturally this presented its own set of challenges, not the least of which was the lack of perfect matching between sectors identified in 1880, in the Royal Commission and in 1890. This lack of matches explains the somewhat ‘ad hoc’ nature of some of the categories listed here. The tables are nonetheless instructive, as they reveal the detailed nature of the tariff considerations by the commissioners; the extent to which variations in the same items (classified by size, length or quality) make generalisations about average tariff rates for even single items problematic and the care that needs to be exercised when discussing the impact of tariffs.
were labour intensive. While the picture is not particularly clear, the table suggests that the Commissioners were not looking to favour particular ‘types’ of energy using sectors. For example, if labour is taken as a signal of old, or less productive technology, then we may have expected a preference of the commission to drop tariffs in sectors which were labour intensive, however, this does not seem to be the case.

Table 10 takes this approach one step further, by indentifying the average horse power in each the industry producing these goods, the value added by each sector (measured in 1880) the value added per firm, the capital in each sector (and per firm) and the average product per pound of capital. Simple t tests suggest that the value added per firm and the average product per pound of capital were significant.36

Table 11 looks at another aspect of the factors underlying the goods recommended to be tariff free by the Royal commission. In this case, the number of males and females employed in each sector, the male/female ratio (as a proxy for skill level) and the average product of labour are reported.

An obvious criticism of this approach is the relatively ad hoc nature of the goods for which we could gather matched information in 1880 and 1890 and which aligned with the Royal Commission’s recommendations. In particular, clothing (given its multiple tariff recommendations and numerous fine variations of type) appears more frequently than other items in the tables. To address this (at least in part) and examine the sensitivity of our results to this potential over representation, we recalculated a weighted average of the data for the clothing sector as a whole. For information, the relative contribution of each good to total industrial output in 1880 is also provided.37 As Table 12 shows, our 30 items constituted just under half of the value of industrial output in 1880. Tables 12 to 15 report the results using these new data with an aggregated clothing sector; the results are not greatly different from those we identify using the disaggregated categories.

Table 16, provides a summary of the results, using both aggregated and disaggregated data on clothing. It provides an overview of the direction and significance of differences in mean values between each of our measures of industrial characteristics and those of the whole of the industrial sector. In broad

36 These tests were conducted on the average of the sectors recommended for free trade against the average of all manufacturing sectors.
37 A better weight would have been to use contribution to gross colonial product, however these data were unavailable. Nor were the data used for our t tests weighted by these proportions.
terms, they suggest that the Commission’s recommendations were to remove protection in sectors that might be considered as ‘growth enhancing’. In particular, the Commission recommended free trade in sectors which had higher value added and had greater levels of capital. The results also suggest that industries employing large quantities of labour were targeted for free trade. Recall that Nunn and Trefler (2006) predict that where institutions are strong, tariff protection if it occurs, will tend to favour growth enhancing industries. Our results appear to be, at least to some extent, the opposite; these industries are targeted for free trade. While labour intensity, particularly in textiles and clothing might indicate low growth technologies being used, we also believe that in the nineteenth century, the growth effects of employment per se may have been somewhat higher than we regard them today.³⁸

In general terms, the government of the day rejected these proposals. Indeed, as a group, they raised tariffs on the categories recommended for free trade, albeit at a rate slightly lower than average overall.³⁹

One interpretation of these results could be that the Royal Commission was actually a mechanism for channelling the preferences of those who appeared before it. These participants were overwhelmingly owners of protected goods, so an equilibrium where items recommended for free trade do not conform to Nunn and Trefler predictions is not unexpected. At the same time, a government that rejects these recommendations might be seen as exhibiting the characteristics of a ‘good institution’. This could especially be the case if employment is seen generally as growth enhancing for this period.

A second possibility is that the government was not prepared to lose revenue. As the tables suggest, average revenue per sector for the items recommended for free trade was higher than the average. However, the revenue on many of these individual items was not large, and tariffs were still increased. Conversely, some items which had large revenues associated with them saw a reduction in their rates.

³⁸ In a sense we can see this in the same light as developing countries of today. Employment more generally will raise individual welfare to enable good nutrition, access to schooling, provide a tax base for infrastructure, etc.

³⁹ It is worth recalling that tariffs are only one instrument by which to support industry. Another is direct subsidy. This issue is noteworthy in the case of paper, for example, as in 1865 the ‘Premium Board’ had recommended an award of £1500 to a large manufacturer of stationary if it could produce ten tons of paper weekly. While the premium was never paid (the owner died before the target was reached) it does demonstrate another factor governments would consider in setting tariffs – the extent of previous assistance. (Linge 1979 p 196-7).
Conclusion

We are now in a position to answer the original questions posed by the paper. Did the Royal Commission seek to protect growth enhancing sectors? The answer is no, not if the growth enhancing align to those outlined by Tena-Junguito. At the very least this inspection of the data suggests there was no overt attempt to target ‘high technology’ or ‘high energy’ using sectors.

Were the sectors which exhibited high levels of value added, or marginal productivity in 1880 subsequently protected in 1890? Again the answer is mixed. For the smaller subset of articles for which the Commission recommended free trade, this does appear to be the case. Our previous work using more comprehensive Victorian data, however, revealed the opposite: tariffs were not particularly focused on goods with high levels of value added or sectors with higher marginal productivity.

Third, were the final tariff rates (1890) were in line with the Commission’s recommendations? For those goods for which the Commission recommended zero tariffs (and which were the focus of this discussion), the answer is clear; the final tariff rates were not in line with the Commission’s recommendations and in many cases moved in the opposite direction. More broadly, and considering all the recommendations of the Commission, it would appear the final outcome was consistently in one direction – to raise tariffs.

No single model is likely to explain the political and economic complexities behind the setting of tariffs in an economy. This paper forms part of an ongoing study on tariffs in Victoria. Our earlier work attempted a direct empirical estimation of Grossman and Helpman’s 1994 model and yielded only weak support for the model. A second viewed Victoria’s tariff policy through the lens of Nunn and Trefler (2006) to examine whether or not growth enhancing industries were targeted. Our results did not offer strong support for this hypothesis and provided weak support for the influence of special interests.

In this paper, we examine the recommendations of the 1880 Royal Commission on tariffs and specifically, a set of items recommended for zero tariffs. Our results suggest that the items recommended for free trade were not those that would be expected under Nunn and Trefler (2006). Nevertheless, while the Royal
Commission appeared to advocate tariff removal on Tena-Junguito defined growth enhancing sectors (a result not consistent with Nunn and Trefler), the government of the day did not adhere to these suggestions. This outcome, thus leaves open possibility that the parliamentary process, rather than the Royal Commission produced the ‘good institution’ result – an outcome which would support Nunn and Trefler’s core thesis.

This raises some interesting interpretations. One is that the Royal Commission, rather than serving as an example of a good institution is better viewed as conduit for lobby group influence. This highlights the complexities surrounding tariff setting. Each good has its own unique ‘story’ regarding its position in the economy and the relative influence of its lobbyists. There are some overall patterns in the recommendations which could be suggestive of this, but without detailed information on the method and costs of production, the effective (as opposed to nominal) tariff rates, the relative quality (and substitutability) of goods relative to their imported competitors etc, it is difficult to tease out the influence of special interest groups from other issues. Perhaps at best, the evidence does at least suggest that these groups were active, but their success in individual sectors varied.\(^{40}\) We can safely conclude that in answer to our initial question, the final pattern of tariff protection was the result of a complex, and (to this point) relatively opaque process.

There are at least three directions for future research. One is to focus more closely on the costs and methods of production, the true effective tariff rates, the quality of products etc in a range of ‘basic’ goods, to gain a better insight into the real position of important sectors in the economy in colonial Victoria. Such a study would require extensive resources to complete. The second is to undertake a comparative study. For example, while Victoria was highly protective, NSW was at the same time essentially a free trade colony. These colonies had similar institutional structures and quality. There are several possible explanations for these differences which arise from the theory – competition between pro-tariff and free trade lobby groups in particular. These could have their origins in such factors as differences in the distribution and ownership of land, access to natural resources, industrial structure to name but three.

\(^{40}\) Such a result is not inconsistent with modern day models of lobbying.
The third related avenue for research is continued development and interpretation of the theory. For example, the exogenous weights ascribed to aggregate welfare (directly and via externalities) in Grossman and Helpman’s 1994 model and that of Nunn and Trefler (2006) have been approximated by the factor ‘institutional quality’. This is certainly not unreasonable, but different aspects of institutions may interact in the model differently. For example, it has been shown that policy convergence between political rivals may exacerbate lobbying when political competition (one aspect of institutional quality) is high.41 In this context, differences between NSW and Victorian trade policy could also be explained by differences in political competition, even though other institutional factors were similar. What exactly, constitutes ‘institutional quality’ remains an open question. More work remains to be done to throw light on these issues.

41 Wilson and Damania (2005).
References:


Nunn N. and D. Trefler, 2006 *Putting the Lid on Lobbying: Tariff Structure and Long-Term Growth When Protection Is For Sale*. NBER Working Paper #12164, April,


Table 1 – Imports, Duty Collected for the Colony of Victoria, 1880

<table>
<thead>
<tr>
<th>Sector</th>
<th>Duty collected (£)</th>
<th>Total imports (£) (c.i.f)</th>
<th>Average Tariff (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wool</td>
<td>0</td>
<td>267954</td>
<td>0.00</td>
</tr>
<tr>
<td>Prints, pictures, etc</td>
<td>0</td>
<td>15249</td>
<td>0.00</td>
</tr>
<tr>
<td>Surgical instruments</td>
<td>0</td>
<td>6523</td>
<td>0.00</td>
</tr>
<tr>
<td>Coal</td>
<td>0</td>
<td>281403</td>
<td>0.00</td>
</tr>
<tr>
<td>Building materials</td>
<td>291</td>
<td>33774</td>
<td>0.86</td>
</tr>
<tr>
<td>Designs, metals and dyes</td>
<td>96</td>
<td>9824</td>
<td>0.98</td>
</tr>
<tr>
<td>Dairy</td>
<td>84</td>
<td>6328</td>
<td>1.33</td>
</tr>
<tr>
<td>Ships and boats</td>
<td>23</td>
<td>1187</td>
<td>1.94</td>
</tr>
<tr>
<td>Books and stationery</td>
<td>7196</td>
<td>219557</td>
<td>3.28</td>
</tr>
<tr>
<td>Agricultural matters</td>
<td>34643</td>
<td>725572</td>
<td>4.77</td>
</tr>
<tr>
<td>Other pastoral</td>
<td>43495</td>
<td>879181</td>
<td>4.95</td>
</tr>
<tr>
<td>Metal products</td>
<td>34682</td>
<td>684994</td>
<td>5.06</td>
</tr>
<tr>
<td>Tanning, fellmonging and woolwashing</td>
<td>9006</td>
<td>159953</td>
<td>5.63</td>
</tr>
<tr>
<td>Machines, tools and implements</td>
<td>10592</td>
<td>133930</td>
<td>7.91</td>
</tr>
<tr>
<td>Miscellaneous manufacturing</td>
<td>28435</td>
<td>352857</td>
<td>8.06</td>
</tr>
<tr>
<td>Textile and clothes</td>
<td>149183</td>
<td>1651198</td>
<td>9.03</td>
</tr>
<tr>
<td>Root crops</td>
<td>95112</td>
<td>974219</td>
<td>9.76</td>
</tr>
<tr>
<td>Bricks and Potteries</td>
<td>99</td>
<td>970</td>
<td>10.21</td>
</tr>
<tr>
<td>Fibrous materials</td>
<td>20488</td>
<td>176930</td>
<td>11.58</td>
</tr>
<tr>
<td>Woollen Mills</td>
<td>83347</td>
<td>655916</td>
<td>12.71</td>
</tr>
<tr>
<td>Meat and Milk products</td>
<td>12390</td>
<td>91968</td>
<td>13.47</td>
</tr>
<tr>
<td>Wheat</td>
<td>42</td>
<td>289</td>
<td>14.53</td>
</tr>
<tr>
<td>Chemicals</td>
<td>40787</td>
<td>277901</td>
<td>14.68</td>
</tr>
<tr>
<td>Clocks and watches</td>
<td>6567</td>
<td>42487</td>
<td>15.46</td>
</tr>
<tr>
<td>Soap and candles</td>
<td>6169</td>
<td>39493</td>
<td>15.62</td>
</tr>
<tr>
<td>Oats</td>
<td>2973</td>
<td>18898</td>
<td>15.73</td>
</tr>
<tr>
<td>Animal by-products</td>
<td>6151</td>
<td>38808</td>
<td>15.85</td>
</tr>
<tr>
<td>Arms, munitions</td>
<td>8257</td>
<td>51824</td>
<td>15.93</td>
</tr>
<tr>
<td>Gold, silver and precious stones</td>
<td>8776</td>
<td>50349</td>
<td>17.43</td>
</tr>
<tr>
<td>carving, figures, etc</td>
<td>3178</td>
<td>17487</td>
<td>18.17</td>
</tr>
<tr>
<td>Stone, clay, earthenware and glass</td>
<td>23403</td>
<td>128545</td>
<td>18.21</td>
</tr>
<tr>
<td>Carriages and harness</td>
<td>3063</td>
<td>16306</td>
<td>18.78</td>
</tr>
<tr>
<td>Flour and cereal</td>
<td>38</td>
<td>192</td>
<td>19.79</td>
</tr>
<tr>
<td>Non-alcoholic and other beverages</td>
<td>128946</td>
<td>642328</td>
<td>20.07</td>
</tr>
<tr>
<td>Other grains</td>
<td>36017</td>
<td>177316</td>
<td>20.31</td>
</tr>
<tr>
<td>Musical instruments</td>
<td>11176</td>
<td>49756</td>
<td>22.46</td>
</tr>
<tr>
<td>Barley</td>
<td>5371</td>
<td>23069</td>
<td>23.28</td>
</tr>
<tr>
<td>Furniture</td>
<td>9103</td>
<td>36700</td>
<td>24.80</td>
</tr>
<tr>
<td>vegetable products</td>
<td>49691</td>
<td>176347</td>
<td>28.18</td>
</tr>
<tr>
<td>Other agricultural</td>
<td>184129</td>
<td>212812</td>
<td>86.52</td>
</tr>
<tr>
<td>Beer</td>
<td>294344</td>
<td>290109</td>
<td>101.46</td>
</tr>
<tr>
<td>Tobacco, cigar and snuff</td>
<td>60200</td>
<td>58906</td>
<td>102.20</td>
</tr>
</tbody>
</table>

Source: Sirwardana (1985), page 153. All values in 1880 pounds. Average tariffs calculated as duty collected/value of goods (cif).
Taken from Wilson and Shanahan (2009)
Table 2 - Imports, Import elasticity of demand estimates

<table>
<thead>
<tr>
<th>Sector</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>Average Tariff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wool</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.38</td>
<td>4.77</td>
</tr>
<tr>
<td>Prints, pictures, etc</td>
<td>3.00</td>
<td>1.46</td>
<td>2.09</td>
<td>0.56</td>
<td>0.00</td>
</tr>
<tr>
<td>Surgical instruments</td>
<td>1.08</td>
<td>0.44</td>
<td>6.64</td>
<td>0.74</td>
<td>1.94</td>
</tr>
<tr>
<td>Coal</td>
<td>0.96</td>
<td>16.11</td>
<td>6.80</td>
<td>0.37</td>
<td>0.00</td>
</tr>
<tr>
<td>Building materials</td>
<td>0.69</td>
<td>1.32</td>
<td>2.87</td>
<td>0.74</td>
<td>0.86</td>
</tr>
<tr>
<td>Designs, metals and dyes</td>
<td>1.02</td>
<td>0.88</td>
<td>1.96</td>
<td>0.74</td>
<td>0.98</td>
</tr>
<tr>
<td>Dairy</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.45</td>
<td>1.33</td>
</tr>
<tr>
<td>Ships and boats</td>
<td>3.28</td>
<td>1.24</td>
<td>0.81</td>
<td>0.74</td>
<td>1.94</td>
</tr>
<tr>
<td>Books and stationery</td>
<td>3.00</td>
<td>1.46</td>
<td>2.09</td>
<td>0.57</td>
<td>3.28</td>
</tr>
<tr>
<td>Agricultural matters</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.38</td>
<td>4.77</td>
</tr>
<tr>
<td>Other pastoral</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.52</td>
<td>4.95</td>
</tr>
<tr>
<td>Metal products</td>
<td>3.59</td>
<td>2.00</td>
<td>2.50</td>
<td>0.57</td>
<td>5.06</td>
</tr>
<tr>
<td>Tanning, fellmonging and woolwashing</td>
<td>1.02</td>
<td>0.21</td>
<td>1.10</td>
<td>0.63</td>
<td>5.63</td>
</tr>
<tr>
<td>Machines, tools and implements</td>
<td>1.02</td>
<td>0.88</td>
<td>1.96</td>
<td>0.56</td>
<td>7.91</td>
</tr>
<tr>
<td>Miscellaneous manufacturing</td>
<td>2.06</td>
<td>2.37</td>
<td>3.11</td>
<td>0.74</td>
<td>8.06</td>
</tr>
<tr>
<td>Textile and clothes</td>
<td>1.14</td>
<td>1.41</td>
<td>1.98</td>
<td>0.90</td>
<td>9.03</td>
</tr>
<tr>
<td>Root crops</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.31</td>
<td>9.76</td>
</tr>
<tr>
<td>Bricks and Potteries</td>
<td>2.85</td>
<td>1.37</td>
<td>2.43</td>
<td>0.56</td>
<td>10.21</td>
</tr>
<tr>
<td>Fibrous materials</td>
<td>1.14</td>
<td>1.41</td>
<td>1.98</td>
<td>0.56</td>
<td>11.58</td>
</tr>
<tr>
<td>Woollen Mills</td>
<td>1.14</td>
<td>0.21</td>
<td>1.20</td>
<td>0.88</td>
<td>12.71</td>
</tr>
<tr>
<td>Meat and Milk products</td>
<td>1.13</td>
<td>1.13</td>
<td>2.45</td>
<td>0.48</td>
<td>13.47</td>
</tr>
<tr>
<td>Wheat</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.30</td>
<td>14.53</td>
</tr>
<tr>
<td>Chemicals</td>
<td>2.53</td>
<td>6.82</td>
<td>3.52</td>
<td>0.74</td>
<td>14.68</td>
</tr>
<tr>
<td>Clocks and watches</td>
<td>2.06</td>
<td>2.37</td>
<td>3.11</td>
<td>0.57</td>
<td>15.46</td>
</tr>
<tr>
<td>Soap and candles</td>
<td>2.53</td>
<td>5.00</td>
<td>2.60</td>
<td>0.74</td>
<td>15.62</td>
</tr>
<tr>
<td>Oats</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.30</td>
<td>15.73</td>
</tr>
<tr>
<td>Animal by-products</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.63</td>
<td>15.85</td>
</tr>
<tr>
<td>Arms, munitions</td>
<td>2.06</td>
<td>2.37</td>
<td>3.11</td>
<td>0.74</td>
<td>15.93</td>
</tr>
<tr>
<td>Gold, silver and precious stones</td>
<td>2.00</td>
<td>1.18</td>
<td>2.16</td>
<td>0.74</td>
<td>17.43</td>
</tr>
<tr>
<td>carving, figures, etc</td>
<td>3.00</td>
<td>1.46</td>
<td>2.09</td>
<td>0.74</td>
<td>18.17</td>
</tr>
<tr>
<td>Stone, clay, earthenware and glass</td>
<td>2.85</td>
<td>1.37</td>
<td>2.43</td>
<td>0.57</td>
<td>18.21</td>
</tr>
<tr>
<td>Carriages and harness</td>
<td>3.28</td>
<td>1.24</td>
<td>0.81</td>
<td>0.74</td>
<td>18.78</td>
</tr>
<tr>
<td>Flour and cereal</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.31</td>
<td>19.79</td>
</tr>
<tr>
<td>Non-alcoholic and other beverages</td>
<td>1.64</td>
<td>1.60</td>
<td>1.30</td>
<td>0.31</td>
<td>20.07</td>
</tr>
<tr>
<td>Other grains</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.30</td>
<td>20.31</td>
</tr>
<tr>
<td>Musical instruments</td>
<td>2.06</td>
<td>2.37</td>
<td>3.11</td>
<td>0.57</td>
<td>22.46</td>
</tr>
<tr>
<td>Barley</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.30</td>
<td>23.28</td>
</tr>
<tr>
<td>Furniture</td>
<td>3.00</td>
<td>9.56</td>
<td>3.72</td>
<td>0.57</td>
<td>24.80</td>
</tr>
<tr>
<td>vegetable products</td>
<td>1.13</td>
<td>1.13</td>
<td>2.45</td>
<td>0.31</td>
<td>28.18</td>
</tr>
<tr>
<td>Other agricultural</td>
<td>1.13</td>
<td>0.21</td>
<td>2.45</td>
<td>0.30</td>
<td>86.52</td>
</tr>
<tr>
<td>Beer</td>
<td>1.64</td>
<td>0.70</td>
<td>1.30</td>
<td>0.31</td>
<td>101.46</td>
</tr>
<tr>
<td>Tobacco, cigar and snuff</td>
<td>1.13</td>
<td>1.57</td>
<td>1.50</td>
<td>0.30</td>
<td>102.20</td>
</tr>
</tbody>
</table>

| Source                           | Taken from Wilson and Shanahan (2009) |

a. Stern et al. (1976)
b. Shiells et al. (1986)
c. Sawers (1988)
d. Calculated from expenditure elasticities (Sirwardana, 1985) and household expenditure shares.
Table 3 – Coefficient Results from G-H Estimation

Dependant Variable: \( \frac{t_i}{1+t_i} e_i \), where elasticity measure used is denoted in the table.

n=42
Robust standard errors estimated, p values in parentheses

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta_1 )</td>
<td>-0.000405 (0.003)</td>
<td>-0.00125 (0.026)</td>
<td>0.000283 (0.69)</td>
<td>-0.00294 (0.003)</td>
</tr>
<tr>
<td>( \beta_2 )</td>
<td>0.000283 (0.000)</td>
<td>0.000874 (0.00)</td>
<td>0.00115 (0.002)</td>
<td>0.00091 (0.008)</td>
</tr>
<tr>
<td>( \beta_1 + \beta_2 )</td>
<td>-0.000121 (0.165)</td>
<td>-0.000373 (0.329)</td>
<td>0.00143 (0.005)</td>
<td>-0.002 (0.004)</td>
</tr>
</tbody>
</table>

a. Siriwardana (1985), see appendix for calculation
b. Stern et al (1976)
c. Sawers (1988)

**Source**: Taken from Wilson and Shanahan (2009)
Table 4
High v low protection in Victoria 1875 and 1880

<table>
<thead>
<tr>
<th>Measure</th>
<th>Top 10</th>
<th></th>
<th></th>
<th>Bottom 10</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1875</td>
<td>1880</td>
<td>1875</td>
<td>1880</td>
<td></td>
</tr>
<tr>
<td>Ave t</td>
<td>0.23</td>
<td>0.27</td>
<td>0.04</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Ave n</td>
<td>18.2</td>
<td>31.6</td>
<td>22.1</td>
<td>17.6</td>
<td></td>
</tr>
<tr>
<td>Ave HP per firm</td>
<td>3.62</td>
<td>3.4</td>
<td>19.6</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td>Prop Steam &amp; Gas*</td>
<td>0.28</td>
<td>0.26</td>
<td>0.39</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Machinery and Plant per firm</td>
<td>729.02</td>
<td>498.5</td>
<td>3408</td>
<td>1209.1</td>
<td></td>
</tr>
<tr>
<td>Machinery and Plant per labourer</td>
<td>50.5</td>
<td>39.7</td>
<td>92.4</td>
<td>66.6</td>
<td></td>
</tr>
<tr>
<td>Female-Male ratio</td>
<td>0.44</td>
<td>0.24</td>
<td>0.19</td>
<td>0.2</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Taken from Wilson and Shanahan (2010)
Table 5 – Results of Panel Regression: 1875-1890

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N firms</td>
<td>-0.002</td>
<td>0.0016</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Land</td>
<td><strong>0.006</strong>*</td>
<td><strong>0.023</strong>*</td>
</tr>
<tr>
<td></td>
<td>(0.013)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Capital</td>
<td>-0.014</td>
<td>-0.012</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>HP</td>
<td><strong>0.024</strong></td>
<td>-0.012</td>
</tr>
<tr>
<td></td>
<td>(0.012)</td>
<td>(0.024)</td>
</tr>
<tr>
<td>Steam</td>
<td><strong>-0.087</strong>**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>0.263</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.192)</td>
<td></td>
</tr>
<tr>
<td>Horse</td>
<td><strong>-0.558</strong>****</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.189)</td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.018)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.160*</td>
<td>0.023</td>
</tr>
<tr>
<td></td>
<td>(0.088)</td>
<td>(0.086)</td>
</tr>
<tr>
<td>n</td>
<td>196</td>
<td>196</td>
</tr>
<tr>
<td>Groups</td>
<td>91</td>
<td>91</td>
</tr>
<tr>
<td>R squared</td>
<td>0.27</td>
<td>0.13</td>
</tr>
<tr>
<td>F statistic</td>
<td><strong>5.51</strong>***</td>
<td><strong>6.78</strong>***</td>
</tr>
</tbody>
</table>

- Fixed effects estimation with robust standard errors
- SEs in parentheses, Significance:  * p<.1 ,  ** p<.05,  *** p<.01
- All independent variables in natural logarithms other than FM. Dependent variable is the natural log of tariff.
- Years covered 1875, 1880 and 1890
- The following sectors, with tariffs greater than 50% were considered most likely to be linked with revenue generation and hence were omitted: Confectionary (51-68%), Chicory (117-145%), distilleries (79-193%), biscuit manufacturing (55%), tobacco (111%).

Source: Taken from Wilson and Shanahan (2010)
### Table 6 – 1880-1890

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>N firms</td>
<td>-0.034**</td>
<td>-0.027*</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>Land</td>
<td>-0.013</td>
<td>0.021***</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Capital</td>
<td>-0.036**</td>
<td>-0.037*</td>
</tr>
<tr>
<td></td>
<td>(0.016)</td>
<td>(0.021)</td>
</tr>
<tr>
<td>HP</td>
<td><strong>0.052</strong>*</td>
<td>0.036**</td>
</tr>
<tr>
<td></td>
<td>(0.017)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>Steam</td>
<td>-0.12*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td><strong>0.644</strong>*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.193)</td>
<td></td>
</tr>
<tr>
<td>Horse</td>
<td>-0.292**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.139)</td>
<td></td>
</tr>
<tr>
<td>Gas</td>
<td>0.0119</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.063)</td>
<td></td>
</tr>
<tr>
<td>Labour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM</td>
<td>-0.034</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.057)</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td><strong>0.453</strong>*</td>
<td>0.337**</td>
</tr>
<tr>
<td></td>
<td>(0.131)</td>
<td>(0.148)</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>136</td>
<td>136</td>
</tr>
<tr>
<td>Groups</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>R squared</td>
<td>0.41</td>
<td>0.29</td>
</tr>
<tr>
<td>F statistic</td>
<td>7.05***</td>
<td>7.91***</td>
</tr>
</tbody>
</table>

- Fixed effects estimation with robust standard errors
- SEs in parentheses, Significance: * p<.1 , ** p<.05 , *** p<.01
- All independent variables in natural logarithms other than FM. Dependent variable is the natural log of tariff.
- Years covered 1880 and 1890
- The following sectors, with tariffs greater than 50% were considered most likely to be linked with revenue generation and hence were omitted: Confectionary (51-68%), Chicory (117-145%), distilleries (79-193%), biscuit manufacturing (55%), tobacco (111%).

**Source:** Taken from Wilson and Shanahan (2010)
### Table 7

**Specific sector tariff levels for Colonial Victoria, following Tena-Junguito’s classifications***

<table>
<thead>
<tr>
<th>Original Classification</th>
<th>Victorian Example</th>
<th>1875 %</th>
<th>1880 %</th>
<th>1890 %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High growth generating sectors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ships</td>
<td><em>Ships, boat builders</em></td>
<td>0.2</td>
<td>0.25</td>
<td>0</td>
</tr>
<tr>
<td>Machines tools and implements - manufactures</td>
<td>Agric implement manufactures</td>
<td>2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>Engine machine manufactures</td>
<td>0.2</td>
<td>0.223</td>
<td>0.35</td>
</tr>
<tr>
<td>Paper manufacturing</td>
<td><em>Paper manufactures</em></td>
<td>none found</td>
<td>0</td>
<td>0.01</td>
</tr>
<tr>
<td>Silo throws</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron and steel manufactures</td>
<td><em>Iron safe manufactures</em></td>
<td>0.2</td>
<td>0.25</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td><em>Iron and tin works</em></td>
<td>0.4</td>
<td>0.62</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Iron, brass and copper foundries</em></td>
<td>0.1</td>
<td>0.25</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>Saddlers ironmongery and coach springs</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leather</td>
<td><em>Moroccan and fancy leather - manufactures</em></td>
<td>0.1</td>
<td>0.1</td>
<td>0.16</td>
</tr>
<tr>
<td><strong>Low growth generating sectors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woollen manufactures</td>
<td><em>blankets</em></td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>rugs</td>
<td>0.1</td>
<td>0.2</td>
<td>0.25</td>
</tr>
<tr>
<td>Linen manufactures</td>
<td><em>tents and tarps - linen</em></td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>other</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cotton manufactures</td>
<td><em>cotton manufactures</em></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>cotton wick</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Jute canvas manufactures</td>
<td>Jute</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Jute piece goods</td>
<td>0.09</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jute matting</td>
<td>0.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woollen yarn</td>
<td>woollen yarn</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Cotton yarn</td>
<td>cotton raw</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>cotton waste</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Note:** *Classification follows Tena-Junguito (2010) who categorised sectors into growth enhancing and non-growth enhancing.*
Table 8

Recommendations of the Royal Commission: disaggregated results

<table>
<thead>
<tr>
<th>Articles to be free</th>
<th>Tariff 1880</th>
<th>Revenue 1880 (£)</th>
<th>Tariff 1890</th>
<th>Difference in rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirtings containing wool</td>
<td>0.150</td>
<td>2,406</td>
<td>0.20</td>
<td>0.05</td>
</tr>
<tr>
<td>Fancy vestings and house flannels</td>
<td>0.150</td>
<td>2,406</td>
<td>0.20</td>
<td>0.05</td>
</tr>
<tr>
<td>Dress piece containing wool</td>
<td>0.075</td>
<td>15,787</td>
<td>0.00</td>
<td>-0.08</td>
</tr>
<tr>
<td>Coloured blankets</td>
<td>0.200</td>
<td>7,001</td>
<td>0.20</td>
<td>0.00</td>
</tr>
<tr>
<td>Gloves except kid or leather</td>
<td>0.200</td>
<td>11,948</td>
<td>0.25</td>
<td>0.05</td>
</tr>
<tr>
<td>Ribbons</td>
<td>0.200</td>
<td>6,016</td>
<td>0.20</td>
<td>0.00</td>
</tr>
<tr>
<td>Crapes</td>
<td>0.200</td>
<td>2,082</td>
<td>0.20</td>
<td>0.00</td>
</tr>
<tr>
<td>Pongees</td>
<td>0.100</td>
<td>854</td>
<td>0.20</td>
<td>0.10</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>0.140</td>
<td>9,898</td>
<td>0.00</td>
<td>-0.14</td>
</tr>
<tr>
<td>Patent leather</td>
<td>0.100</td>
<td>4,611</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>0.250</td>
<td>529</td>
<td>0.35</td>
<td>0.10</td>
</tr>
<tr>
<td>Portable engines</td>
<td>0.250</td>
<td>7,929</td>
<td>0.35</td>
<td>0.10</td>
</tr>
<tr>
<td>Steam ploughs and tackle</td>
<td>0.000</td>
<td></td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Manufactures of metals</td>
<td>0.250</td>
<td>12,565</td>
<td>0.35</td>
<td>0.10</td>
</tr>
<tr>
<td>Threshing machines</td>
<td>0.200</td>
<td></td>
<td>0.20</td>
<td>0.00</td>
</tr>
<tr>
<td>Powder, blasting</td>
<td>0.200</td>
<td>3,657</td>
<td>0.19</td>
<td>-0.02</td>
</tr>
<tr>
<td>Cottage ink bottles</td>
<td>0.150</td>
<td></td>
<td>0.17</td>
<td>0.02</td>
</tr>
<tr>
<td>Glass bottles - spirits, wine</td>
<td>0.500</td>
<td>12,126</td>
<td>0.50</td>
<td>0.00</td>
</tr>
<tr>
<td>Corks, cut</td>
<td>0.180</td>
<td>2,173</td>
<td>0.17</td>
<td>-0.01</td>
</tr>
<tr>
<td>Gelatine</td>
<td>0.140</td>
<td>225</td>
<td>0.14</td>
<td>0.00</td>
</tr>
<tr>
<td>Nitrate of silver</td>
<td>0.220</td>
<td>15</td>
<td>0.19</td>
<td>-0.03</td>
</tr>
<tr>
<td>Paper</td>
<td>0.085</td>
<td>1,490</td>
<td>0.00</td>
<td>-0.09</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>0.200</td>
<td>6,289</td>
<td>0.20</td>
<td>0.00</td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.350</td>
<td>55</td>
<td>0.53</td>
<td>0.18</td>
</tr>
<tr>
<td>Macaroni</td>
<td>0.310</td>
<td>410</td>
<td>0.46</td>
<td>0.15</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>0.100</td>
<td>90</td>
<td>0.19</td>
<td>0.09</td>
</tr>
<tr>
<td>Biscuits</td>
<td>0.200</td>
<td>14</td>
<td>0.29</td>
<td>0.09</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>0.060</td>
<td>27,262</td>
<td>0.19</td>
<td>0.13</td>
</tr>
<tr>
<td>Oilmen's Stores</td>
<td>0.200</td>
<td>2,108</td>
<td>0.20</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Average: 0.187  5239**  0.216*  0.029**

Average all goods: 0.15  2273  0.20  0.05

Note: ttest: ***p<0.01; ** p<0.05;  * p<0.1 All cases Ha>Ho other than Dif” (Ha<Ho)
### Table 9

**Recommendations of the Royal commission: disaggregated goods by energy source of production**

<table>
<thead>
<tr>
<th>To be free</th>
<th>n</th>
<th>Prop steam</th>
<th>Prop water</th>
<th>Prop gas</th>
<th>Prop horse</th>
<th>Prop labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirtings containing wool</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Fancy vestings and house flannels</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Dress piece containing wool</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Coloured blankets</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Gloves except kid or leather</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Ribbons</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Crapes</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Pongees</td>
<td>63</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>14</td>
<td>0.286</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.714</td>
</tr>
<tr>
<td>Patent leather</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.000</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>73</td>
<td>0.822</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.178</td>
</tr>
<tr>
<td>Portable engines</td>
<td>77</td>
<td>0.623</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.377</td>
</tr>
<tr>
<td>Steam ploughs and tackle</td>
<td>54</td>
<td>0.519</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.481</td>
</tr>
<tr>
<td>manufactures of metals</td>
<td>159</td>
<td>0.472</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.509</td>
</tr>
<tr>
<td>threshing machines</td>
<td>54</td>
<td>0.519</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.481</td>
</tr>
<tr>
<td>powder, blasting</td>
<td>3</td>
<td>0.333</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.667</td>
</tr>
<tr>
<td>cottage ink bottles</td>
<td>9</td>
<td>0.222</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.778</td>
</tr>
<tr>
<td>Glass bottles - spirits, wine</td>
<td>9</td>
<td>0.222</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.778</td>
</tr>
<tr>
<td>corks, cut</td>
<td>2</td>
<td>0.000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.000</td>
</tr>
<tr>
<td>gelatine</td>
<td>6</td>
<td>0.333</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.667</td>
</tr>
<tr>
<td>nitrate of silver</td>
<td>6</td>
<td>0.333</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.667</td>
</tr>
<tr>
<td>Paper</td>
<td>3</td>
<td>0.667</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.333</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>7</td>
<td>0.286</td>
<td>0</td>
<td>0.286</td>
<td>0</td>
<td>0.429</td>
</tr>
<tr>
<td>Vegetables</td>
<td>37</td>
<td>0.486</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.486</td>
</tr>
<tr>
<td>Macaroni</td>
<td>2</td>
<td>0.000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.000</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>16</td>
<td>0.688</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.313</td>
</tr>
<tr>
<td>Biscuits</td>
<td>13</td>
<td>0.538</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.462</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>8</td>
<td>0.750</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.250</td>
</tr>
<tr>
<td>Oilmen's Stores</td>
<td>11</td>
<td>0.091</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.909</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>36</td>
<td>0.280</td>
<td>0</td>
<td>0.018</td>
<td>0</td>
<td>0.700**</td>
</tr>
</tbody>
</table>

**Average all manufacturing**

|                                            | 17.25 | 0.277 | 0.004 | 0.014 | 0.001 | 0.566 |

Note: ttest: ***p<0.01; ** p<0.05; * p<0.1 All cases Ha>Ho other than Dif” (Ha<Ho)
Table 10

Recommendations of the Royal commission: disaggregated goods classified by horse power, value added and capital

<table>
<thead>
<tr>
<th>To be free</th>
<th>HP sector</th>
<th>HP per firm</th>
<th>VA sector (£)</th>
<th>VA per firm (£)</th>
<th>K K per firm (£)</th>
<th>AP K (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirtings containing wool</td>
<td>13</td>
<td>0.21</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
</tr>
<tr>
<td>Fancy vestings and house flannels</td>
<td>13</td>
<td>0.21</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
</tr>
<tr>
<td>Dress piece containing wool</td>
<td>13</td>
<td>0.21</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
</tr>
<tr>
<td>Coloured blankets</td>
<td>13</td>
<td>0.21</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
</tr>
<tr>
<td>Gloves except kid or leather</td>
<td>13</td>
<td>0.21</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
</tr>
<tr>
<td>Ribbons</td>
<td>13</td>
<td>0.21</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
</tr>
<tr>
<td>Crapes</td>
<td>13</td>
<td>0.21</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
</tr>
<tr>
<td>Pongees</td>
<td>13</td>
<td>0.21</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>109</td>
<td>7.79</td>
<td>23665</td>
<td>1690</td>
<td>24295</td>
<td>1735</td>
</tr>
<tr>
<td>Patent leather</td>
<td>0</td>
<td>0.00</td>
<td>1920</td>
<td>640</td>
<td>410</td>
<td>137</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>684</td>
<td>9.37</td>
<td>227568</td>
<td>3117</td>
<td>230121</td>
<td>3152</td>
</tr>
<tr>
<td>Portable engines</td>
<td>524</td>
<td>6.81</td>
<td>169856</td>
<td>2206</td>
<td>159368</td>
<td>2070</td>
</tr>
<tr>
<td>Steam ploughs and tackle</td>
<td>234</td>
<td>4.33</td>
<td>110876</td>
<td>2053</td>
<td>52875</td>
<td>979</td>
</tr>
<tr>
<td>Manufactures of metals</td>
<td>965</td>
<td>6.07</td>
<td>361181</td>
<td>2272</td>
<td>297491</td>
<td>1871</td>
</tr>
<tr>
<td>Threshing machines</td>
<td>234</td>
<td>4.33</td>
<td>110876</td>
<td>2053</td>
<td>52875</td>
<td>979</td>
</tr>
<tr>
<td>Powder, blasting</td>
<td>28</td>
<td>9.33</td>
<td>6773</td>
<td>2258</td>
<td>4150</td>
<td>1383</td>
</tr>
<tr>
<td>Cottage ink bottles</td>
<td>9</td>
<td>1.00</td>
<td>28445</td>
<td>3161</td>
<td>9360</td>
<td>1040</td>
</tr>
<tr>
<td>Glass bottles - spirits, wine</td>
<td>9</td>
<td>1.00</td>
<td>28445</td>
<td>3161</td>
<td>9360</td>
<td>1040</td>
</tr>
<tr>
<td>Corks, cut</td>
<td>0</td>
<td>0.00</td>
<td>1000</td>
<td>500</td>
<td>1250</td>
<td>625</td>
</tr>
<tr>
<td>Gelatine</td>
<td>20</td>
<td>3.33</td>
<td>18440</td>
<td>3073</td>
<td>13540</td>
<td>2257</td>
</tr>
<tr>
<td>Nitrate of silver</td>
<td>20</td>
<td>3.33</td>
<td>18440</td>
<td>3073</td>
<td>13540</td>
<td>2257</td>
</tr>
<tr>
<td>Paper</td>
<td>410</td>
<td>136.67</td>
<td>23070</td>
<td>7690</td>
<td>43070</td>
<td>14357</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>44</td>
<td>6.29</td>
<td>37671</td>
<td>5382</td>
<td>22700</td>
<td>3243</td>
</tr>
<tr>
<td>Vegetables</td>
<td>200</td>
<td>5.41</td>
<td>135665</td>
<td>3667</td>
<td>37611</td>
<td>1017</td>
</tr>
<tr>
<td>Macaroni</td>
<td>0</td>
<td>0.00</td>
<td>105</td>
<td>53</td>
<td>155</td>
<td>78</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>139</td>
<td>8.69</td>
<td>66640</td>
<td>4165</td>
<td>18750</td>
<td>1172</td>
</tr>
<tr>
<td>Biscuits</td>
<td>98</td>
<td>7.54</td>
<td>75730</td>
<td>5825</td>
<td>16225</td>
<td>1248</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>52</td>
<td>6.50</td>
<td>5500</td>
<td>688</td>
<td>5150</td>
<td>644</td>
</tr>
<tr>
<td>Oilmen's Stores</td>
<td>4</td>
<td>0.36</td>
<td>9890</td>
<td>899</td>
<td>2330</td>
<td>212</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>130</td>
<td>7.69</td>
<td>153999***</td>
<td>3682***</td>
<td>39,222*</td>
<td>1499</td>
</tr>
<tr>
<td><strong>Average all manufacturing</strong></td>
<td>82</td>
<td>5.15</td>
<td>35152</td>
<td>1473</td>
<td>20,067</td>
<td>1171</td>
</tr>
</tbody>
</table>

Note: ttest: ***p<0.01; ** p<0.05; * p<0.1 All cases Ha>Ho other than ‘Dif’ (Ha<Ho)
Table 11

Recommendations of the Royal commission: disaggregated goods classified by labour

<table>
<thead>
<tr>
<th>To be free</th>
<th>Males</th>
<th>Females</th>
<th>F/M ratio</th>
<th>Labourers per firm</th>
<th>AP L(unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirtings containing wool</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.92</td>
</tr>
<tr>
<td>Fancy vestings and house flannels</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.92</td>
</tr>
<tr>
<td>Dress piece containing wool</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.92</td>
</tr>
<tr>
<td>Coloured blankets</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.92</td>
</tr>
<tr>
<td>Gloves except kid or leather</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.92</td>
</tr>
<tr>
<td>Ribbons</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.92</td>
</tr>
<tr>
<td>Crapes</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.92</td>
</tr>
<tr>
<td>Pongeess</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.92</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>181</td>
<td>5</td>
<td>0.03</td>
<td>13.29</td>
<td>323.82</td>
</tr>
<tr>
<td>Patent leather</td>
<td>12</td>
<td>0</td>
<td>0.00</td>
<td>4.00</td>
<td>366.67</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>2070</td>
<td>6</td>
<td>0.00</td>
<td>28.44</td>
<td>212.86</td>
</tr>
<tr>
<td>Portable engines</td>
<td>1803</td>
<td>8</td>
<td>0.00</td>
<td>23.52</td>
<td>158.88</td>
</tr>
<tr>
<td>Steam ploughs and tackle</td>
<td>973</td>
<td>2</td>
<td>0.00</td>
<td>18.06</td>
<td>207.73</td>
</tr>
<tr>
<td>manufactures of metals</td>
<td>3220</td>
<td>21</td>
<td>0.01</td>
<td>20.38</td>
<td>238.54</td>
</tr>
<tr>
<td>threshing machines</td>
<td>973</td>
<td>2</td>
<td>0.00</td>
<td>18.06</td>
<td>207.73</td>
</tr>
<tr>
<td>powder, blasting</td>
<td>37</td>
<td>2</td>
<td>0.05</td>
<td>13.00</td>
<td>429.15</td>
</tr>
<tr>
<td>cottage ink bottles</td>
<td>236</td>
<td>2</td>
<td>0.01</td>
<td>26.44</td>
<td>172.90</td>
</tr>
<tr>
<td>Glass bottles - spirits, wine</td>
<td>236</td>
<td>2</td>
<td>0.01</td>
<td>26.44</td>
<td>172.90</td>
</tr>
<tr>
<td>corks, cut</td>
<td>9</td>
<td>0</td>
<td>0.00</td>
<td>4.50</td>
<td>344.44</td>
</tr>
<tr>
<td>gelatine</td>
<td>31</td>
<td>2</td>
<td>0.06</td>
<td>5.50</td>
<td>1321.21</td>
</tr>
<tr>
<td>nitrate of silver</td>
<td>31</td>
<td>2</td>
<td>0.06</td>
<td>5.50</td>
<td>1321.21</td>
</tr>
<tr>
<td>Paper</td>
<td>113</td>
<td>72</td>
<td>0.64</td>
<td>61.67</td>
<td>256.05</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>416</td>
<td>154</td>
<td>0.37</td>
<td>81.43</td>
<td>175.54</td>
</tr>
<tr>
<td>Vegetables</td>
<td>779</td>
<td>122</td>
<td>0.16</td>
<td>24.35</td>
<td>415.76</td>
</tr>
<tr>
<td>Macaroni</td>
<td>2</td>
<td>1</td>
<td>0.50</td>
<td>1.50</td>
<td>76.67</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>444</td>
<td>3</td>
<td>0.01</td>
<td>27.94</td>
<td>578.95</td>
</tr>
<tr>
<td>Biscuits</td>
<td>404</td>
<td>67</td>
<td>0.17</td>
<td>36.23</td>
<td>386.07</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>30</td>
<td>1</td>
<td>0.03</td>
<td>3.88</td>
<td>458.06</td>
</tr>
<tr>
<td>Oilmens's Stores</td>
<td>60</td>
<td>27</td>
<td>0.45</td>
<td>7.91</td>
<td>210.80</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>609***</td>
<td>985***</td>
<td>1.38***</td>
<td>34.48***</td>
<td>320.01</td>
</tr>
<tr>
<td><strong>Average all manufacturing</strong></td>
<td>231</td>
<td>54</td>
<td>0.30</td>
<td>11.35</td>
<td>315.50</td>
</tr>
</tbody>
</table>

Note: ttest: ***p<0.01; ** p<0.05;  * p<0.1 All cases Ha>Ho other than ‘Dif’ (Ha<Ho)
Table 12

Recommendations of the Royal Commission: aggregated values on clothing; sector weights included.

<table>
<thead>
<tr>
<th>To be free</th>
<th>Weight</th>
<th>Tariff 1880</th>
<th>Revenue 1880 (£)</th>
<th>Tariff 1890</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing</td>
<td>0.093</td>
<td>0.16</td>
<td>46094</td>
<td>0.18</td>
<td>0.02</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>0.007</td>
<td>0.14</td>
<td>9898</td>
<td>0.00</td>
<td>-0.14</td>
</tr>
<tr>
<td>Patent leather</td>
<td>0.001</td>
<td>0.10</td>
<td>4611</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>0.054</td>
<td>0.25</td>
<td>529</td>
<td>0.35</td>
<td>0.10</td>
</tr>
<tr>
<td>Portable engines</td>
<td>0.035</td>
<td>0.25</td>
<td>7929</td>
<td>0.35</td>
<td>0.10</td>
</tr>
<tr>
<td>Steam ploghs and tackle</td>
<td>0.025</td>
<td>0.25</td>
<td>0.00</td>
<td>-0.25</td>
<td></td>
</tr>
<tr>
<td>manufactures of metals</td>
<td>0.095</td>
<td>0.25</td>
<td>0.35</td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>threshing machines</td>
<td>0.025</td>
<td>0.20</td>
<td>0.20</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>powder, blasting</td>
<td>0.002</td>
<td>0.20</td>
<td>3657</td>
<td>0.19</td>
<td>-0.02</td>
</tr>
<tr>
<td>cottage ink bottles</td>
<td>0.005</td>
<td>0.15</td>
<td>0.17</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Glass bottles - spirits, wine</td>
<td>0.005</td>
<td>0.50</td>
<td>12126</td>
<td>0.50</td>
<td>0.00</td>
</tr>
<tr>
<td>corks, cut</td>
<td>0.000</td>
<td>0.18</td>
<td>2173</td>
<td>0.17</td>
<td>-0.01</td>
</tr>
<tr>
<td>gelatine</td>
<td>0.005</td>
<td>0.14</td>
<td>225</td>
<td>0.14</td>
<td>0.00</td>
</tr>
<tr>
<td>nitrate of silver</td>
<td>0.005</td>
<td>0.22</td>
<td>15</td>
<td>0.19</td>
<td>-0.03</td>
</tr>
<tr>
<td>Paper</td>
<td>0.006</td>
<td>0.09</td>
<td>1490</td>
<td>0.00</td>
<td>-0.09</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>0.012</td>
<td>0.20</td>
<td>6289</td>
<td>0.20</td>
<td>0.00</td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.046</td>
<td>0.35</td>
<td>55</td>
<td>0.53</td>
<td>0.18</td>
</tr>
<tr>
<td>Macaroni</td>
<td>0.000</td>
<td>0.31</td>
<td>410</td>
<td>0.46</td>
<td>0.15</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>0.032</td>
<td>0.10</td>
<td>90</td>
<td>0.19</td>
<td>0.09</td>
</tr>
<tr>
<td>Biscuits</td>
<td>0.022</td>
<td>0.20</td>
<td>14</td>
<td>0.29</td>
<td>0.09</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>0.002</td>
<td>0.06</td>
<td>27262</td>
<td>0.19</td>
<td>0.13</td>
</tr>
<tr>
<td>Oilmen's Stores</td>
<td>0.002</td>
<td>0.20</td>
<td>2108</td>
<td>0.20</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td>0.480</td>
<td>na</td>
<td>124975</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>0.20**</td>
<td>6943***</td>
<td>0.23*</td>
<td>0.029***</td>
<td></td>
</tr>
<tr>
<td><strong>Average all imports</strong></td>
<td>0.15</td>
<td>2273</td>
<td>0.20</td>
<td>0.05</td>
<td></td>
</tr>
</tbody>
</table>

*Note:* **p<0.01;  **p<0.05;  *p<0.1 All cases Ha>Ho other than ‘Dif” (Ha<Ho)
### Table 13

Recommendations of the Royal Commission: aggregated values on clothing, by energy source of production

<table>
<thead>
<tr>
<th>To be free</th>
<th>n</th>
<th>Prop steam</th>
<th>Prop water</th>
<th>Prop gas</th>
<th>Prop horse</th>
<th>Prop labour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing</td>
<td>63.0</td>
<td>0</td>
<td>0</td>
<td>0.032</td>
<td>0</td>
<td>0.968</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>14.0</td>
<td>0.286</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.714</td>
</tr>
<tr>
<td>Patent leather</td>
<td>3.0</td>
<td>0.000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.000</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>73.0</td>
<td>0.822</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.178</td>
</tr>
<tr>
<td>Portable engines</td>
<td>77.0</td>
<td>0.623</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.377</td>
</tr>
<tr>
<td>Steam ploughs and tackle</td>
<td>54.0</td>
<td>0.519</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.481</td>
</tr>
<tr>
<td>manufactures of metals</td>
<td>159.0</td>
<td>0.472</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.509</td>
</tr>
<tr>
<td>threshing machines</td>
<td>54.0</td>
<td>0.519</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.481</td>
</tr>
<tr>
<td>powder, blasting</td>
<td>3.0</td>
<td>0.333</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.667</td>
</tr>
<tr>
<td>cottage ink bottles</td>
<td>9.0</td>
<td>0.222</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.778</td>
</tr>
<tr>
<td>Glass bottles - spirits,wine</td>
<td>9.0</td>
<td>0.222</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.778</td>
</tr>
<tr>
<td>corks, cut</td>
<td>2.0</td>
<td>0.000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.000</td>
</tr>
<tr>
<td>gelatine</td>
<td>6.0</td>
<td>0.333</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.667</td>
</tr>
<tr>
<td>nitrate of silver</td>
<td>6.0</td>
<td>0.333</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.667</td>
</tr>
<tr>
<td>Paper</td>
<td>3.0</td>
<td>0.667</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.333</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>7.0</td>
<td>0.286</td>
<td>0</td>
<td>0.286</td>
<td>0</td>
<td>0.429</td>
</tr>
<tr>
<td>Vegetables</td>
<td>37.0</td>
<td>0.486</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.486</td>
</tr>
<tr>
<td>Macaroni</td>
<td>2.0</td>
<td>0.000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1.000</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>16.0</td>
<td>0.688</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.313</td>
</tr>
<tr>
<td>Biscuits</td>
<td>13.0</td>
<td>0.538</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.462</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>8.0</td>
<td>0.750</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.250</td>
</tr>
<tr>
<td>Oilmen's Stores</td>
<td>11.0</td>
<td>0.091</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.909</td>
</tr>
<tr>
<td>Average</td>
<td>28.6*</td>
<td>0.372*</td>
<td>0</td>
<td>0.014</td>
<td>0</td>
<td>0.611</td>
</tr>
<tr>
<td>Average all sectors</td>
<td>17.3</td>
<td>0.320</td>
<td>0.004</td>
<td>0.014</td>
<td>0.001</td>
<td>0.566</td>
</tr>
</tbody>
</table>

**Note:** t-test: ***p<0.01; ** p<0.05; * p<0.1  All cases Ha>Ho other than ‘Dif’ (Ha<Ho)
Table 14

Recommendations of the Royal Commission: aggregated values on clothing by horse power, value added and capital

<table>
<thead>
<tr>
<th>To be free</th>
<th>Horse Power</th>
<th>Horse Power n</th>
<th>Value Added (£)</th>
<th>Value Added n</th>
<th>K (£)</th>
<th>K_n</th>
<th>Av Prod K ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing</td>
<td>13</td>
<td>0.2</td>
<td>391220</td>
<td>6210</td>
<td>19086</td>
<td>303</td>
<td>39.9</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>109</td>
<td>7.8</td>
<td>23665</td>
<td>1690</td>
<td>24295</td>
<td>1735</td>
<td>2.5</td>
</tr>
<tr>
<td>Patent leather</td>
<td>0</td>
<td>0.0</td>
<td>1920</td>
<td>640</td>
<td>410</td>
<td>137</td>
<td>10.7</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>684</td>
<td>9.4</td>
<td>227568</td>
<td>3117</td>
<td>230121</td>
<td>3152</td>
<td>1.9</td>
</tr>
<tr>
<td>Portable engines</td>
<td>524</td>
<td>6.8</td>
<td>169856</td>
<td>2206</td>
<td>159368</td>
<td>2070</td>
<td>1.8</td>
</tr>
<tr>
<td>Steam ploghs and tackle</td>
<td>234</td>
<td>4.3</td>
<td>110876</td>
<td>2053</td>
<td>52875</td>
<td>979</td>
<td>3.8</td>
</tr>
<tr>
<td>manufactures of metals</td>
<td>965</td>
<td>6.1</td>
<td>361181</td>
<td>2272</td>
<td>297491</td>
<td>1871</td>
<td>2.6</td>
</tr>
<tr>
<td>threshing machines</td>
<td>234</td>
<td>4.3</td>
<td>110876</td>
<td>2053</td>
<td>52875</td>
<td>979</td>
<td>3.8</td>
</tr>
<tr>
<td>powder, blasting</td>
<td>28</td>
<td>9.3</td>
<td>6773</td>
<td>2258</td>
<td>4150</td>
<td>1383</td>
<td>4.0</td>
</tr>
<tr>
<td>cottage ink bottles</td>
<td>9</td>
<td>1.0</td>
<td>28445</td>
<td>3161</td>
<td>9360</td>
<td>1040</td>
<td>4.4</td>
</tr>
<tr>
<td>Glass bottles - spirits,wine</td>
<td>9</td>
<td>1.0</td>
<td>28445</td>
<td>3161</td>
<td>9360</td>
<td>1040</td>
<td>4.4</td>
</tr>
<tr>
<td>corks, cut</td>
<td>0</td>
<td>0.0</td>
<td>1000</td>
<td>500</td>
<td>1250</td>
<td>625</td>
<td>2.5</td>
</tr>
<tr>
<td>gelatine</td>
<td>20</td>
<td>3.3</td>
<td>18440</td>
<td>3073</td>
<td>13540</td>
<td>2257</td>
<td>3.2</td>
</tr>
<tr>
<td>nitrate of silver</td>
<td>20</td>
<td>3.3</td>
<td>18440</td>
<td>3073</td>
<td>13540</td>
<td>2257</td>
<td>3.2</td>
</tr>
<tr>
<td>Paper</td>
<td>410</td>
<td>136.7</td>
<td>23070</td>
<td>7690</td>
<td>43070</td>
<td>14357</td>
<td>1.1</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>44</td>
<td>6.3</td>
<td>37671</td>
<td>5382</td>
<td>22700</td>
<td>3243</td>
<td>4.4</td>
</tr>
<tr>
<td>Vegetables</td>
<td>200</td>
<td>5.4</td>
<td>135665</td>
<td>3667</td>
<td>37611</td>
<td>1017</td>
<td>10.0</td>
</tr>
<tr>
<td>Macaroni</td>
<td>0</td>
<td>0.0</td>
<td>105</td>
<td>53</td>
<td>155</td>
<td>78</td>
<td>1.5</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>139</td>
<td>8.7</td>
<td>66640</td>
<td>4165</td>
<td>18750</td>
<td>1172</td>
<td>13.8</td>
</tr>
<tr>
<td>Biscuits</td>
<td>98</td>
<td>7.5</td>
<td>75730</td>
<td>5825</td>
<td>16225</td>
<td>1248</td>
<td>11.2</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>52</td>
<td>6.5</td>
<td>5500</td>
<td>688</td>
<td>5150</td>
<td>644</td>
<td>2.8</td>
</tr>
<tr>
<td>Oilmen's Stores</td>
<td>4</td>
<td>0.4</td>
<td>9890</td>
<td>899</td>
<td>2330</td>
<td>212</td>
<td>7.9</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>173*</td>
<td>10.4</td>
<td>84226***</td>
<td>2902***</td>
<td>46987**</td>
<td>1900</td>
<td>6.4</td>
</tr>
<tr>
<td><strong>Average all sectors</strong></td>
<td>82</td>
<td>5.2</td>
<td>35152</td>
<td>1473</td>
<td>20067</td>
<td>1171</td>
<td>9.0</td>
</tr>
</tbody>
</table>

**Note:** ttest: *** p<0.01; ** p<0.05; * p<0.1 All cases Ha>Ho other than ‘Dif’ (Ha<Ho)
Table 15

Recommendations of the Royal Commission: aggregated values on clothing by labour.

<table>
<thead>
<tr>
<th>To be free</th>
<th>Males</th>
<th>Females</th>
<th>F/M ratio</th>
<th>Labour per firm</th>
<th>AP Labour (unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing</td>
<td>748</td>
<td>3630</td>
<td>4.85</td>
<td>69.49</td>
<td>173.9</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>181</td>
<td>5</td>
<td>0.03</td>
<td>13.29</td>
<td>323.8</td>
</tr>
<tr>
<td>Patent leather</td>
<td>12</td>
<td>0</td>
<td>0.00</td>
<td>4.00</td>
<td>366.7</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>2070</td>
<td>6</td>
<td>0.00</td>
<td>28.44</td>
<td>212.9</td>
</tr>
<tr>
<td>Portable engines</td>
<td>1803</td>
<td>8</td>
<td>0.00</td>
<td>23.52</td>
<td>158.9</td>
</tr>
<tr>
<td>Steam ploghs and tackle</td>
<td>973</td>
<td>2</td>
<td>0.00</td>
<td>18.06</td>
<td>207.7</td>
</tr>
<tr>
<td>manufactures of metals</td>
<td>3220</td>
<td>21</td>
<td>0.01</td>
<td>20.38</td>
<td>238.5</td>
</tr>
<tr>
<td>threshing machines</td>
<td>973</td>
<td>2</td>
<td>0.00</td>
<td>18.06</td>
<td>207.7</td>
</tr>
<tr>
<td>powder, blasting</td>
<td>37</td>
<td>2</td>
<td>0.05</td>
<td>13.00</td>
<td>429.2</td>
</tr>
<tr>
<td>cottage ink bottles</td>
<td>236</td>
<td>2</td>
<td>0.01</td>
<td>26.44</td>
<td>172.9</td>
</tr>
<tr>
<td>Glass bottles - spirits, wine</td>
<td>236</td>
<td>2</td>
<td>0.01</td>
<td>26.44</td>
<td>172.9</td>
</tr>
<tr>
<td>corks, cut</td>
<td>9</td>
<td>0</td>
<td>0.00</td>
<td>4.50</td>
<td>344.4</td>
</tr>
<tr>
<td>gelatine</td>
<td>31</td>
<td>2</td>
<td>0.06</td>
<td>5.50</td>
<td>1321.2</td>
</tr>
<tr>
<td>nitrate of silver</td>
<td>31</td>
<td>2</td>
<td>0.06</td>
<td>5.50</td>
<td>1321.2</td>
</tr>
<tr>
<td>Paper</td>
<td>113</td>
<td>72</td>
<td>0.64</td>
<td>61.67</td>
<td>256.1</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>416</td>
<td>154</td>
<td>0.37</td>
<td>81.43</td>
<td>175.5</td>
</tr>
<tr>
<td>Vegetables</td>
<td>779</td>
<td>122</td>
<td>0.16</td>
<td>24.35</td>
<td>415.8</td>
</tr>
<tr>
<td>Macaroni</td>
<td>2</td>
<td>1</td>
<td>0.50</td>
<td>1.50</td>
<td>76.7</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>444</td>
<td>3</td>
<td>0.01</td>
<td>27.94</td>
<td>578.9</td>
</tr>
<tr>
<td>Biscuits</td>
<td>404</td>
<td>67</td>
<td>0.17</td>
<td>36.23</td>
<td>386.1</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>30</td>
<td>1</td>
<td>0.03</td>
<td>3.88</td>
<td>458.1</td>
</tr>
<tr>
<td>Oilmen's Stores</td>
<td>60</td>
<td>27</td>
<td>0.45</td>
<td>7.91</td>
<td>210.8</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>582***</td>
<td>188*</td>
<td>0.34</td>
<td><strong>23.71</strong>*</td>
<td>373.2</td>
</tr>
<tr>
<td><strong>Average all sectors</strong></td>
<td>231</td>
<td>54</td>
<td>0.30</td>
<td>11.35</td>
<td>315.5</td>
</tr>
</tbody>
</table>

**Note:** t-test: ***p<0.01; ** p<0.05; * p<0.1   All cases Ha>Ho other than ‘Dif’ (Ha<Ho)
Table 16
Summary of differences between items recommended for free trade and all sectors

<table>
<thead>
<tr>
<th></th>
<th>Sample versus all sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>clothing items disaggregated</td>
</tr>
<tr>
<td>Tariff 1880</td>
<td>&gt;</td>
</tr>
<tr>
<td>Revenue 1880</td>
<td>&gt;**</td>
</tr>
<tr>
<td>Tariff 1890</td>
<td>&gt;**</td>
</tr>
<tr>
<td>Difference in tariff 1890-1880</td>
<td>&lt;***</td>
</tr>
<tr>
<td>number of firms</td>
<td>&gt;***</td>
</tr>
<tr>
<td>proportion using steam</td>
<td>&gt;</td>
</tr>
<tr>
<td>proportion using water</td>
<td>&lt;</td>
</tr>
<tr>
<td>proportion using gas</td>
<td>&gt;</td>
</tr>
<tr>
<td>proportion using horse</td>
<td>&lt;</td>
</tr>
<tr>
<td>proportion using labour</td>
<td>&gt;**</td>
</tr>
<tr>
<td>Horsepower generated by sector</td>
<td>&gt;</td>
</tr>
<tr>
<td>Horsepower per firm</td>
<td>&gt;</td>
</tr>
<tr>
<td>Value added by sector</td>
<td>&gt;***</td>
</tr>
<tr>
<td>Value added per firm</td>
<td>&gt;***</td>
</tr>
<tr>
<td>Capital stock sector</td>
<td>&gt;*</td>
</tr>
<tr>
<td>Capital per firm</td>
<td>&gt;</td>
</tr>
<tr>
<td>Ave. product k (£)</td>
<td>&gt;**</td>
</tr>
<tr>
<td>Males employed</td>
<td>&gt;***</td>
</tr>
<tr>
<td>Females employed</td>
<td>&gt;***</td>
</tr>
<tr>
<td>Female/male ratio</td>
<td>&gt;***</td>
</tr>
<tr>
<td>Labourers per firm</td>
<td>&gt;***</td>
</tr>
<tr>
<td>Ave product L (unit)</td>
<td>&gt;</td>
</tr>
</tbody>
</table>

Note: ttest: ***p<0.01; ** p<0.05; * p<0.1 All cases Ha>Ho other than ‘Dif’ (Ha<Ho)
<table>
<thead>
<tr>
<th><strong>To be free</strong></th>
<th><strong>Sector used as proxy</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing</td>
<td>clothing factories</td>
</tr>
<tr>
<td>Corn and flour sacks</td>
<td>Rope, twine works</td>
</tr>
<tr>
<td>Patent leather</td>
<td>Morroco, fancy leather manufactories</td>
</tr>
<tr>
<td>Prepared plates for engravers and lithographers</td>
<td>Iron, brass and copper foundries</td>
</tr>
<tr>
<td>Portable engines</td>
<td>Engine machine - manufacturers</td>
</tr>
<tr>
<td>Steam ploghs and tackle manufactures of metals</td>
<td>Agricultural implement manufacturers</td>
</tr>
<tr>
<td>threshing machines</td>
<td>Agricultural implement manufacturers</td>
</tr>
<tr>
<td>powder, blasting</td>
<td>Blasting, powder, etc manufactories</td>
</tr>
<tr>
<td>cottage ink bottles</td>
<td>Glass works</td>
</tr>
<tr>
<td>Glass bottles - spirits, wine</td>
<td>Glass works</td>
</tr>
<tr>
<td>corks, cut</td>
<td>Cork manufactories</td>
</tr>
<tr>
<td>gelatine</td>
<td>Chemical Works</td>
</tr>
<tr>
<td>nitrate of silver</td>
<td>Chemical Works</td>
</tr>
<tr>
<td>Paper</td>
<td>Paper manufactories</td>
</tr>
<tr>
<td>Manufactured Stationery</td>
<td>Account book manufactories, manufacturing stationers</td>
</tr>
<tr>
<td>Vegetables</td>
<td>vegetable food</td>
</tr>
<tr>
<td>Macaroni</td>
<td>Macaroni works</td>
</tr>
<tr>
<td>Meats, Preserved</td>
<td>Meat curing establishments</td>
</tr>
<tr>
<td>Biscuits</td>
<td>Biscuit manufactories</td>
</tr>
<tr>
<td>Oils, in bulk</td>
<td>Glue, oil manufactories</td>
</tr>
<tr>
<td>Oilmen’s Stores</td>
<td>Sauce, pickle manufactories / jam manufactories</td>
</tr>
</tbody>
</table>