

Tariffs, subsidies and profits: a re-assessment of structural change
in Australia 1901-1939

David Merrett
University of Melbourne
and
Simon Ville
University of Wollongong

Australian and Pacific Economic and Business History Conference

University of Sydney

12-14 February 2007

Tariffs, subsidies and profits: a re-assessment of structural change in Australia 1901-1939

Abstract

This paper offers a re-interpretation of the drivers of structural change in Australia from federation until the outbreak of World War II. The broad story of structural change is that manufacturing increased its relative share of both output and employment while the share of the farm sector and mining contracted. The large tertiary sector, including construction, oscillated around its mean. The conventional wisdom is that these shifts were largely the result of government policy, particularly the increase in trade barriers that stimulated import substitution by manufacturers. However, if the unit of analysis is the firm rather than the economy then a wider range of possibilities come into view. We contend that profit maximizing firms responded to changing relative profits between and within sectors that shifted in response to more sources of stimuli than tariffs and subsidies. These included exogenous shifts in consumer preferences and a number of changes on the supply side: the adoption of new technologies, changing factor proportions, and greater specialization in manufacturing and services generating positive experience effects.

Introduction

In the first half of the twentieth century the Australian economy made a substantial shift away from its reliance on resource-based industries. Manufacturing industry lifted its share of both output and employment. Nearly all of the growth in the share of manufacturing was accounted for by a reduction of the share of the farm and mining sectors. A very large tertiary sector, comprising services and construction, oscillated around its trend. The data sets of GDP, employment and capital formation generated by Butlin and others¹ provide the starting point for discussion. These data will be reviewed in the first section of the paper.

The conventional explanation of the relative rise of manufacturing rests largely on the role of the tariff. Rising levels of tariff protection enabled local producers to capture a larger share of the market from increasingly expensive imports. This literature on structural change will be discussed in the second section. The paper will then proceed by arguing that the previous explanations of sectoral change do not provide a convincing account of the rise of manufacturing relative to the primary sector let alone the rise and fall of industries within manufacturing and the large services sector. New data of profits at the industry level promises to provide a more accurate picture of the changing choice

¹ Butlin, N. G. *Australian Domestic Product, Investment and Foreign Borrowing 1861-1939* (Cambridge: Cambridge University Press, 1962); M. Keating, *The Australian Workforce 1910-11 to 1960-61* (Canberra: Australian National University, 1973); Butlin, N. G. and J. A. Dowie 'Estimates of Australian workforce and employment 1861-1961', *Australian Economic History Review*, **IX**, 1969, pp. 38-55.

set facing people making strategic decisions about where to do business.² These data highlight the role of both changes in output prices, as captured in the discussion of tariffs and subsidies, and developments on the supply side. Technological change, endogenous and exogenous, transformed the landscape of relative profitability. Much of the changing structure of the Australian economy was the result of the emergence of new industries founded on new production possibilities. There was a sequential dimension to this process with the developments up stream in the generation of new sources of energy, particularly electricity, being a precondition for changes down stream.

Structural change 1901-1939

The structure of the Australian economy altered in many ways in the first half of the twentieth century. The big picture is a relative growth of manufacturing that is nearly offset by a contraction in rural and mining activity with the large service sector remaining at a roughly constant figure. National income account data of product indicate shifts in the relative importance at a sector level.³ The broad shifts revealed by these indicators are mirrored by changes in the distribution of the workforce.⁴ Research on particular sectors, industries or regions provides evidence of absolute expansion or decline that adds detail and nuance to the broad sweep of the aggregate data, including the shifting balance between the size of the public and private sector.⁵

Together the GDP and employment series demonstrate the broad sweep of change in the structure of the economy from 1901 up to WWII. The data is shown in Tables 1 and 2 below. Manufacturing grew significantly both in terms of its share of employment, from 15 to 24 per cent, and its share of output, 13 to 18 per cent, from a low base. Its expansion was broadly matched by the contraction in the primary sector, a decline in share of employment from 33 to 24 per cent and a fall in share of output from 37 to 28 per cent. Services, to which the utilities of gas, electricity and water, and construction are added to become the tertiary sector, were the cornerstone of the economy with a largely unchanged contribution as an employer and income generator at around the low 50 per cent for both employment and product.

Table 1 about here

² See Simon Ville and David Merrett, 'A time series for business profitability in twentieth-century Australia', *Australian Economic Review*, 39, 3, September 2006, pp. 330-39.

³ Butlin, *Australian Domestic Product*; Idem, 'Some perspectives of Australian economic development, 1890-1965', in Colin Forster, ed., *Australian Economic Development in the Twentieth Century* (London and Sydney: George Allen & Unwin and Australasian Publishing Company), 1970, pp. 266-327; Dowie, J. A. 'The service ensemble' in Forster, ed., *Australian Economic Development*, pp. 208-65;

⁴ Keating, *Australian Workforce*.

⁵ Forster, C., *Industrial Development in Australia 1920-1930* (Canberra: Australian National University), 1970; Snooks, G. D., *Depression and Recovery in Western Australia, 1928/29-1938/39: A Study in Cyclical and Structural Change* (Nedlands, WA: University of Western Australia Press), 1974; Barnard, A. and N. G. Butlin, 'Australian public and private capital formation, 1901-75', *Economic Record*, 1981, pp.354-67; Sinclair, W. A., 'Capital formation', in Forster, ed., *Australian Economic Development*, pp. 11-65; Mathews, R. L. and W. R. C. Jay, *Federal Finance: Intergovernmental Financial Relations in Australia Since Federation* (Melbourne: Thomas Nelson (Australia) Limited), 1972, Tables 13 and 22, pp. 102 and 169.

Table 2 about here

The data are widely recognized as robust indicators of trends. However, there are difficulties in using them as measures of structural change. The two key references are Butlin (1962) and Keating (1973) who constructed the long term estimates of national accounts and workforce data respectively. These series have been subject to commentary and revisions.⁶ There are a number of problems. These data rely heavily on the *Production Bulletins* covering farming, mining and manufacturing and the population *Census*. The very large service sector is practically invisible. Attempts to calculate its output are bedeviled by the intangible nature of the product. Valuations of its inputs are used instead. This places great reliance on the accuracy of the employment series in services, which rest heavily on inter-census interpolation that masks year to year fluctuations, and wage data that is less than comprehensive. Further conceptual and practical issues arise in drawing boundaries between the sectors. Some authors, such as Dowie, aggregate the nine industry classification used by Butlin to a threefold classification, viz, primary, secondary and tertiary.⁷ This process involves making important decisions about boundaries, particularly about whether mining should be included with the rural sector or with manufacturing, and whether industries such as construction and utilities that have tangible product should be separated from 'services'.

If our purpose is to trace the changing structure of the economy over time then data at the highest level of disaggregation is most useful. The industry classifications adopted in the *Production Bulletins* are too broad to identify the supply side responses to changes in relative profitability. The industry sub-divisions, akin to two-digit ANZSIC data, and sub-categories, the equivalent of the three-digit ANZSIC data, disguise as much as they reveal. This data was simply not fine grained enough to allow the observation of the emergence of new industries, products or processes as they happened. The first Manufacturing statistics were published in the *Production Bulletin* in 1907. From that time until a major revision of the manufacturing sub-divisions in 1931 the number of industries classified had risen from 100 to 115. From 1931 there were 146.⁸ Similar problems arose when classifying workers amongst occupations. In his Report about the 1933 Census the Statistician concluded that 'the taxonomic problem [of classifying occupations] is never completely solved. It is complicated by the development of new

⁶ See references in note 2 above.

⁷ Maddock and McLean follow Boehm in using four: 'farming', 'mining', 'manufacturing' and 'other'. Rodney Maddock and Ian W. McLean, 'The Australian economy in the very long run', in R. Maddock and I. W. McLean, eds., *The Australian Economy in the Long Run* (Cambridge: Cambridge University Press), 1987, Table 1.2, 19.

⁸ The original classification of manufacturing industries adopted by the Conference of Statisticians in 1902 remained in use until 1931. At the beginning there were 19 'industries' and 100 sub-categories. By 1929-30 the number of sub-categories had increased to 115. Moreover, a number of the sub-categories had also been moved between 'industries'. Two of the 'industries', Class XI 'vehicles' and XVIII 'leather', had been reclassified to comprise motor vehicles and rubber goods respectively. Subsequent to the revision of 1930-31 there were fewer industrial sub-divisions, 16, but many more sub-categories, 146. Commonwealth Bureau of Census and Statistics, *Production Bulletin 1931* (Canberra: Government Printer).

fields of industrial enterprise and by the splitting and overlapping of fields previously conventionally definable, by the emergence of new occupations, crafts and callings, [and] by the further specialization and division of labour...'⁹

Explanations of Structural Change

Describing the structural transformation has proven to be more straightforward than explaining what caused it to take place. The aggregate data captures the net outcome of hundreds of thousands of decisions taken by businesses and households in any year. The 'shape' of the economy¹⁰ altered continuously as entrepreneurs, investors and workers readjusted their behaviours in the light of a set of price signals. The most relevant sets of information were the terms of trade between industries¹¹ and the relative profitability of firms between industries, the latter showing the return to investing in a bundle of resources to produce those goods and services.

The existing literature has focused most of its attention on one set of price signals, tariffs and subsidies. Tariffs rose from 1907 onwards driving a wedge between domestic and 'free trade' prices for manufactures.¹² There are two indices of the 'height' of the tariff. The first is a simple average of the revenue collected divided by the value of net imports, both dutiable and total, entering the country in the same year.¹³ Graph 1 shows that the average rate of duty paid on those imports on which duty was payable remained roughly constant from 1903 until the beginning of WWI when it fell until 1921 before rising above pre-war levels before the onset of the 1929 depression. Average rates rose sharply thereafter, inflated by primage duty that was levied from 1931 until 1939. The ratio of duty paid on all imports followed the same broad pattern although the percentage of imports admitted free of duty fluctuated by rising before the WWI, falling in the 1920s

⁹ *Statistician's Report, Census of the Commonwealth of Australia, 1933* (Canberra: Government Printer), Vol. 3, 214.

¹⁰ Butlin, N. G., 'The shape of the Australian economy 1861-1900', *Economic Record*, **34**, 1, 1958, pp. 10-29.

¹¹ '... the intersectoral terms of trade... governed resource allocation within the domestic economy.' Mark Thomas, 'Manufacturing and economic recovery in Australia, 1932-1937', in R. G. Gregory and N. G. Butlin, eds, *Recovery from the Depression: Australia and the World economy in the 1930s* (Cambridge: Cambridge University Press), 1988, p. 269.

¹² For a discussion of changes in the tariff see A. J. Reitsma, *Trade Protection in Australia* (Brisbane: University of Queensland Press), 1960, chapter 2; Kym Anderson and Ross Garnaut, *Australian Protectionism: Extent, Causes and Effects* (Sydney: Allen & Unwin), 1987, chapters 2 & 4. The tariff was subject to broad revisions in 1908, 1911, 1914, 1921, 1926 and 1928 before the introduction of a host of emergency measures in the Scullin Tariff between August 1929 and July 1931. Tariff schedules were further affected in the 1930s as Australia offered increased preference to Britain and other trading partners through its participation in the Ottawa Agreement in 1932 and the ill-fated trade diversion policies of the late 1930s. The introduction of preferential tariffs from 1908 meant that the rate of duty differed according to the country from which the import was sourced. One imported item, bottled beer for instance, may pay several rates of duty depending on the country of origin. Furthermore, the Tariff Board, established in 1921, made numerous alterations to duties on individual items through out the 1920s and 1930s. G. J. R. Linge, *Index of Australian Tariff Board Reports 1901-1961* (Canberra: Australian National University), 1964.

¹³ Australia, *Overseas Trade Bulletin* (Canberra: Government Printer), various.

and rising again in the 1930s.¹⁴ The simple average method has a downward bias in that, *ceteris paribus*, the higher the rate of duty the lower the value of imports and so the less duty collected. Another study has recalculated the data, using a sample of commodities for which corresponding import and production figures are available, using local production and imports as the denominator.¹⁵ This series, an index, shows higher rates of increase in the 'weight' of the tariff than the simple average especially during the 1920s.

Graph 1 about here

Governments also altered the ratio of domestic to 'free trade' prices through other means, primarily subsidies to domestic producers. Bounties and subsidies were paid to producers in many industries. However, the farming industries were the major recipients. The form of subsidy ranged from producers receiving cash grants through to being provided with transport services at less than cost and price support schemes.¹⁶ A number of attempts were made in the late 1920s and 1930s to estimate the value of this assistance.¹⁷ The authors of *The Australian Tariff* calculated that the subsidy equivalent of the tariff to manufacturing was £26m in 1926-27 while primary industries were not far behind receiving £22m. By 1932-33, the subsidy equivalent paid to primary industry had risen to £29m with the amount going to manufacturing having fallen to £19m.¹⁸

Contemporary economists decried the allocative effect of tariffs and subsidies.¹⁹ They argued, in some memorable prose, that these policies distorted markets in ways that led to a loss of national welfare. Shann, for instance, wrote in 1929 of the creation a system of

¹⁴ The impact of the revised tariff schedules was two-fold. Rates were increased and more goods were made dutiable. Applying the 1908-11 and 1914 tariff schedules to the 1913 imports demonstrated that the average rate on all imports was increased from 16.75 per cent to 21.48 per cent as a result of the new schedule. The value of dutiable imports rose from £44.6m to £51.0m. *Commonwealth Year Book of Australia* 1914 (Canberra: Government Printer), p. 603. The same calculation comparing the impact of the 1921 tariff schedule with that of 1908-11 showed that the average rate of duty on all imports was 22.46 per cent in 1921, little more than in 1914. However, the percentage of imports admitted duty free had fallen from 55 per cent in under the 1908-11 schedule to 42.96 per cent under the 1914 schedule to 29.12 per cent in 1921. *Commonwealth Year Book of Australia* 1921 (Canberra: Government Printer), pp. 503-05.

¹⁵ A. T. Carmody, 'The level of the Australian tariff: a study in method', *Yorkshire Bulletin of Economic and Social Research*, 4, 1, 1952, pp. 51-65.

¹⁶ See F. W. Eggleston, *State Socialism in Victoria* (London: P. S. King & Son), 1932; N. G. Butlin, A. Barnard and J. J. Pincus, *Government and Capitalism: Public and Private Choice in Twentieth Century Australia* (Sydney: George Allen & Unwin), 1982.

¹⁷ L. F. Giblin, 'Some costs of marketing control', *Economic Record*, IV, Supplement, February, 1928, pp. 148-54; J. B. Bridgen, et.al., *The Australian Tariff: An Economic Enquiry* (Melbourne: Melbourne University Press in association with Macmillan & Co.), 1929, Part IV and Appendices N and O; and J. F. Nimmo, 'The effect of the tariff on the Australian consumption standard', in F. W. Eggleston, et.al., *Australian Standards of Living* (Melbourne: Melbourne University Press in association with Oxford University Press) 1939, pp. 118-19.

¹⁸ Nimmo, 'Effect of the tariff', p. 121.

¹⁹ Benham, *Prosperity of Australia*, chapter 5; Bridgen, et.al., *The Australian Tariff*; Giblin, 'Costs of marketing control'.

‘faked prices’ that ‘deranges and weakens [the] whole economy.’²⁰ Benham asserted that ‘there has been deliberate interference with the “price-mechanism,”’²¹ likening this to the actions of a ‘Dictator.’²² All agreed that Australia’s comparative advantage lay in its resource-based industries. The farm and mining industries were exporters who of necessity accepted the world price for their products. In contrast, manufacturing and services were sheltered from world markets, the former because of tariffs and the latter by its non-tradeable nature. The export sector could not pass on higher costs to its customers whereas the sheltered industries could. Tariffs raised the input costs of the export sector so narrowing its margins. Moreover, increases in domestic prices feed back into higher wages through an indexation mechanism.²³ By the late 1920s there was serious concern that the process may have gone too far by threatening the viability of the export industries. The rapid increase in the level of assistance being given to the minor rural industries even before the onset of the 1930s depression served to reinforce the point. As Giblin so famously wrote:

The vision that comes is of Australia as one enormous sheep bestriding a bottomless pit, with statesman, lawyer, miner, landlord, farmer and factory hand all hanging on desperately to the locks of its abundant fleece. The limits to protection are set by what the sheep will carry, and there are definite limits to that, even if the threat of synthetic wool remains only a threat.²⁴

The debate about the welfare loss associated with the tariff has continued to the present day. Anderson and Garnaut, encapsulate the prevailing view with the statement that ‘one of the most robust conclusions from economic theory is that protection reduces per capita national income of a small economy.’²⁵ The analysis undertaken by Bridgen and his co-authors has been revised over the years by more formal and increasingly sophisticated modeling.²⁶ This literature that draws heavily from international trade theory passes over the issue of the mechanism by which tariffs caused manufacturing to grow relative to the rest of the economy in terms of the resources it used and its share of product.

The link between tariffs and subsidies and the relative expansion of manufacturing in the economy is made most clearly by Benham. Tariffs result in higher domestic prices than would be the case under free trade and also permit the manufacturer to pay higher money wages. He argues that “‘protected” industries are thus rendered more profitable, and more capital and labour therefore flows towards them, than would be the case under free

²⁰ E. Shann, *An Economic History of Australia* (Cambridge: Cambridge University Press), 1948, p.447.

²¹ Benham, *Prosperity of Australia*, p. 139.

²² Benham, *Prosperity of Australia*, p. 137.

²³ Keith Hancock, ‘The first half century of Australian wage policy – Part 2’, *Journal of Industrial Relations*, 21, 1979, pp. 129-60.

²⁴ Giblin, ‘Costs of marketing control’, p.154.

²⁵ Kym Anderson and Ross Garnaut, *Australian Protectionism: Extent, Causes and Effects* (Sydney: Allen & Unwin), 1987, p. 12.

²⁶ William Coleman, Selwyn Cornish and Alf Hagger, *Giblin’s Platoon: The Trials and Triumph of the Economist in Australian Public Life* (Canberra: ANU E Press), 2006, pp. 56-73 & 8083; Rod Tyers and William Colman, ‘Beyond Brigden: Australia’s pre-war manufacturing tariffs, real wages and economic size’, presented at conference on: Globalisation in Asia and the Pacific before the Modern Era, Australian National University, 30 June – 1 July 2005; Prema-chandra Athukorala and Satish Chand, ‘Tariff-growth nexus in the Australian economy, 1870-2002: Is there a paradox?’, unpublished paper.

trade.’²⁷ Moreover, ‘...labour and resources are deliberately diverted away from non-protected industries and towards protected industries, or, broadly speaking, away from Primary Production and towards Manufacturing.’²⁸ The question is how much of the shift towards manufacturing was the result of such policies? Benham equivocates noting that the share of workers in the primary sector had fallen secularly in advanced economies as a result of technological change. He concludes that the tariff had really operated at the margin, as under free trade ‘Manufacturing would have expanded to a *somewhat* smaller extent, and in a somewhat different way.’²⁹ The structure of manufacturing was altered as ‘labour and resources were diverted to the more highly protected Manufacturing industries.’³⁰

This proposition can be tested with two sets of data. The first draws on information about the average rate of duty for 76 sub-categories of manufacturing industries, the equivalent of three-digit ANZSIC, for the year 1932-33.³¹ The sample covers 66 per cent of the industry sub-categories and contains 51 per cent of total employment. We tested the relationship between the height of the tariff, as measured by the simple average of customs duty paid divided by the value of imports, and the numbers employed in each of the industries receiving protection. Conventional regression analysis showed that the errors were not normally distributed. The regression was re-run having logged the data. The null hypothesis that there is no association between tariff levels and the size of resources in an industry, using employment as a proxy, was rejected. The t statistic is 1.834055 and the P-value 0.070612, which is slightly beyond the 5 per cent limit. However, the adjusted R² is only 3 per cent, so we can conclude that no significant explanatory relationship existed between tariffs and employment. The results are shown in full in Appendix 1.

However, this test does not capture other influences that might effect employment by industries. Another test was undertaken to test the relationship between changes in tariff levels and changes in employment for a smaller set of industries. This procedure was possible because of data that aligns ‘industry’ employment data with corresponding tariff ‘rates’ at the two-digit ANZSIC level. From 1919 the Statistician published data that allocates imports to appropriate class of the customs’ schedules.³² We have selected ten manufacturing ‘industries’ that best approximate the activities covered by the customs classifications in 1918-19, 1928-29 and 1938-39.³³ These industries account for 85, 87

²⁷ Benham, *Prosperity of Australia*, p. 138.

²⁸ Benham, *Prosperity of Australia*, p. 139.

²⁹ Benham, *Prosperity of Australia*, p. 146. Emphasis in the original.

³⁰ Benham, *Prosperity of Australia*, p.162.

³¹ Nimmo, ‘The effect of the tariff’, Appendix B, pp. 154-57. Only those industries were selected for whom matching employment data could be found in the *Production Bulletin 1932-33*, Table 110, pp. 77-81.

³² The classifications used by the Statistician with respect to manufacturing output and employment, imports and duty payable in the *Production Bulletin* and *Overseas Trade Bulletin* differ significantly.

³³ They are, using the 1928-29 *Production Bulletin* classifications, ‘Stone, clay and glass’, ‘Oils and fats’ and ‘Drugs and chemicals’, Metal works, machinery’, ‘Jewellery’, ‘Clothing and textiles’, ‘Leather’, ‘Food and drink’, ‘Working in wood’ and ‘Furniture, bedding’, and ‘Musical instruments’. The corresponding Customs classifications are ‘Earthenware, cement, china, glass and stone’, ‘Drugs and chemicals’ and ‘Oils, paints and varnishes’, ‘Metals and machinery’, ‘Jewellery and fancy goods’, ‘Textiles’, ‘Hides, leather and rubber’, ‘Agricultural products and groceries’, ‘Wood, wicker and cane’, ‘Paper and stationery,

and 91 per cent of all manufacturing employment at those dates. Multiple regression analysis is employed to determine the extent of causality. Changes in the average rate of duty between 1918-19 and 1928-29 and then between 1928-29 and 1938-39 are the independent variables. Changes in employment, as a proxy for resources used in each industry, for the same periods are the dependent variable. Each industry has a dummy variable. The null hypothesis that there is no relationship is confirmed as the t statistics is -0.707929 and the P-value 0.496912, well beyond the 5 per cent limit. The results are shown in full in Appendix 11.³⁴

Further doubt has been cast on the link between changes in tariff rates and the expansion of manufacturing by Mark Thomas in his study of recovery from the 1930s depression.³⁵ His analysis of the role of import substitution as a contributor to output growth throughout the inter-war period demonstrates that there was no simple relationship between increases in tariffs, and devaluation, and declining import penetration. The 1921 tariff and further revisions in 1926 and 1928 did not result in increased import substitution.³⁶ The decomposition of output growth shows that import substitution made a negative contribution to the growth of total expenditure between 1919-20 and 1928-29.³⁷ In marked contrast there was a sharp increase in the contribution of import substitution between 1928-29 and 1931-32. However, Thomas argues that this resulted more from the increased competitiveness of Australian manufacturing as domestic costs fell than from the impact of either the Scullin Tariff or devaluation. Moreover, import substitution played a negative role during the recovery phase after 1932 up to the outbreak of the war. He concludes that 'the contribution of massive import substitution to Australian recovery appears on such evidence to be a myth.'³⁸

Re-evaluating the Process of Structural Change

Tariffs and profits

Benham and others have argued that the profits of manufacturers rose as tariffs rose. Local producers, it is alleged, will charge higher prices as tariffs rise because they can be 'passed on.'³⁹ Increased average revenues are assumed to result in higher profits. This is not necessarily the case. Let us suppose that imports and domestic products are perfect substitutes⁴⁰, and that imports make up 20 per cent of the market. A new tariff of 10 per cent is imposed on imports that results in zero demand for those products. What is the appropriate response of the local firms if they are profit-maximizing? Let us also suppose

and 'Musical instruments'. We have excluded customs revenues gathered for 'Ale, spirits and beverages' and 'Tobacco and preparations thereof' and 'Sugar' as the former two were the equivalent of excise while the import of sugar was effectively prohibited.

³⁴ [The results were statistically significant for four individual industries – bricks, metals, jewellery, and clothing.](#)

³⁵ Thomas, 'Manufacturing', pp. 246-71.

³⁶ Thomas, 'Manufacturing', p. 252.

³⁷ Thomas, 'Manufacturing', Table 11.2, p. 255.

³⁸ Thomas, "Manufacturing", p. 255.

³⁹ Brigden, et.al., *The Australian Tariff*, Part V, 'Passing on of excess cost'.

⁴⁰ A questionable assumption. See Thomas, 'Manufacturing' pp. 249-51.

that each firm was in an equilibrium position, with marginal cost and marginal revenues equal, before the onset of the tariff. How will they respond to the tariff? They can raise their price to the pre-tariff price plus duty. Demand will fall correspondingly. However, by taking this action their marginal revenues will rise above marginal costs. Profit maximizing behaviour will lead each firm to increase its supply back to the pre-tariff production level so reducing the price. If the new price, with 80 per cent of the pre-tariff demand being supplied, exceeds the pre-tariff price existing firms in the industry will have an incentive to increase supply and/or new entrants would start production as long as they can do so without marginal costs exceeding marginal revenues. Production would increase to the point where the 20 per cent of the market supplied by imports has been met locally. The price would fall back to the pre-tariff level as long as there is a competitive market.

Those making the argument in the 1920s that an increase in tariffs would increase profits had seen fit to qualify the case. By raising prices after a tariff increase firms would trigger a subsequent increase in costs. Cost rises were of two sorts. The first came from the centralized wage system that automatically adjusted the Basic Wage to movements in price indexes that measured the 'cost of living'. A combination of higher prices for imports and domestic goods would feed through into quarterly 'cost of living' adjustments.⁴¹ Secondly, insofar as firms relied on imported inputs their costs were increased.⁴² In its Reports in the 1920s the Tariff Board lamented that firms were using the increase costs as a rationale for greater protection and expressed alarm at the growing divergence between money wages in Australian and overseas.⁴³ The impact on the margins earned by firms of these costs pressures would once again depend on industry and firm-specific factors. Industries with lower labour-capital ratios would have greater immunity than labour intensive operations. Moreover, industries with less reliance on imported inputs were better placed to cope. Whatever the industry effects might be it is hard to escape the conclusion that the supposed positive stimulus to profits given by tariffs in the first instance were quickly moderated by these feedback loops.

The impact of tariffs on profitability will depend on industry and firm-specific reactions. First, the elasticity of supply of the domestic industry matters.⁴⁴ Competitive industries are more likely to increase their supply so reducing price below the post-tariff import price than more highly concentrated ones. Local monopolies can set a price to maximize profits. Industries with binding cartel agreements could hold prices above competitive levels after the tariff was imposed. How competitive was Australian manufacturing in the first four decades of the twentieth century? The prevailing view is that many industries had high levels of seller concentration and/or engaged in collusive behaviour especially

⁴¹ See references in note 23 above.

⁴² Roughly three-quarters of imports were producer goods. Thomas, 'Manufacturing', p. 266 and notes 14 & 15.

⁴³ Brigden, et.al., *The Australian Tariff*, Appendix C.

⁴⁴ '...the capacity to increase prices differs greatly between ...industries. It depends upon the conditions of supply and demand for the goods produced. Where demand is fairly rigid, and the supply is responsive to market conditions, the necessary increase in prices may be almost automatic. Differences in conditions of supply are probably the more important causes of differences in capacity to increase prices to cover the costs imposed.' Brigden, et.al., *The Australian Tariff*, p.53

with respect to price agreements.⁴⁵ A recent study has found that the increase in seller concentration in many manufacturing industries before WWII was the result of the adoption of new technologies that allowed for significant economies of scale.⁴⁶ Barriers to entry rose quickly in those industries where firms could reap economies of scale or establish powerful brands.⁴⁷ Firms enjoying market power defended their above normal returns behind barriers to entry that became increasingly difficult for new entrants to breach. Incumbency delivered more than scale economies in production. That advantage was reinforced by privileged access to technology through patents or licensing agreements, registered trade marks and brand acceptance, established relationships with suppliers and distributors, internally generated competencies gained by experience, superior organizational design, and privileged access to finance through retained earnings and the ability to raise debt and equity more cheaply.⁴⁸ However, these barriers were breached if the rewards on offer were large enough. There was entry into even highly concentrated industries such as glass, rubber tyres and confectionary by both foreign and domestic firms.⁴⁹ A recent study has shown that profitability and new capital issues, both in manufacturing and the economy as a whole, followed very similar trajectories through the interwar period. This would suggest that new investment flowed unimpeded into profitable industries and products.⁵⁰

Technological change and changes in labour-capital ratios were commonplace in the economy. Often the two were associated as technology was embodied in new machinery that reduced the need for labour or substituted lower cost process workers for craftsmen. The importance of these developments has been underplayed in the literature, which has focused its attention on the gap between productivity levels in Australia and overseas. Our concern is on the impact of such investments on relative profitability amongst firms within the domestic industry. In such circumstances, competitive advantage amongst firms within an industry could swing in favour of those undertaking most investment in new production methods. Firms with lower costs had an incentive to increase supply to the point where the new equilibrium price was lower than the pre-tariff price. Is there evidence to support this argument? Colin Forster concluded after a careful review of the data that 'although it is impossible to measure with precision the growth of manufacturing productivity in Australia during the 1920s, general considerations indicate

⁴⁵ Butlin, Barnard and Pincus, *Government and Capitalism: Public and Private Choice in Twentieth Century Australia* (Sydney: George Allen & Unwin), 1982, chp. 4. See also H. L. Wilkinson, *The Trust Movement in Australia* (Melbourne: Critchley Parker), 1914; J. N. Rawlings, *Who Owns Australia?* (Melbourne: Left Book Club), 1937.

⁴⁶ Fleming, Merrett and Ville, *The Big End of Town*, pp. 85-88. Cf. Forster, 'Economies of scale'.

⁴⁷ Joe S. Bain, *Barriers to New Competition* (Cambridge, MA: Harvard University Press), 1956.

⁴⁸ Fleming, Merrett and Ville, *The Big End of Town*, pp.

⁴⁹ H. Fountain, 'Technology acquisition, firm capability and sustainable competitive advantage: A study of Australian Glass Manufacturers Ltd, 1915-39', in D. Merrett, ed, *Business Institutions and Behaviour in Australia* (London: Frank Cass), 2000, pp. 89-108; T. Barker, 'Pilkington: the reluctant multinational' in G. Jones, ed, *British Multinationals: Origins, Management and Performance* (Aldershot: Gower), 1986, pp. ; G. Jones, 'Multinational chocolate: Cadbury overseas', *Business History*, 26, 1984, pp. ; J. Stanton, 'Protection, market structure and firm behaviour: inefficiency in the early Australia tyre industry', *Australian Economic History Review*, 42, 2, 1984, pp.

⁵⁰ Merrett, Parnell and Ville, 'Capital Formation and Structural Change in Interwar Australia'.

that the increase was substantial.⁵¹ Mark Thomas argues that Australian manufacturing increased in competitiveness vis-a-vis imports in the 1930s through a combination of 'the increased efficiency of Australian industry and declining input prices.'⁵² This resulted in part from the growth of the local market that permitted the realization of economies of scale in some industries but, Forster suggests, was insufficient to provide minimum efficient scale for those capital-intensive and science-based industries of the second industrial revolution.⁵³ However, new technologies were adopted in many industries that provided an opportunity for incumbents or entrants to reshape the nature of 'rivalry'.⁵⁴ Moreover, there was the substitution of machinery for labour on a large scale across a wide range of industries. Once again, there were marked differences in the extent and timing of this process between industries that could explain the reconfiguration of industry structure.⁵⁵

Rural industries and the burden of 'excess costs'

The counter point to the rise of manufacturing was the decline of the farm and mining industries. The earlier literature makes a clear connection between the two events. Costs in the export sector were pushed higher because of higher wage and input costs resulting from tariff protection. Unlike the 'sheltered' industries, the exporting rural and mining industries could not 'pass on' higher costs in the world's commodity markets in which they were price takers. Primary producers and miners were caught between upward pressures on costs and a commodity cycle that turned downwards from the mid-1920s before collapsing in 1929.⁵⁶

Agricultural economists would predict a relative contraction in the size of the primary sector over the long term because of the underlying elasticity of demand and supply.⁵⁷ As income grows the demand for foodstuffs does not rise proportionately. Freebairn reports that the estimates for the income elasticity for foodstuffs in Australia range from 0.21 to 0.76.⁵⁸ This would have been the case in export markets as well. Demand for the products of Australian's rural producers and miners grew more slowly as incomes rose at home and abroad. The prospects facing primary producers turned against them in the inter-war period as world demand and supply schedules shifted inward and outward, respectively, turning the terms of trade sharply against them. Demand for wool and mineral products such as coal and iron ore and non-ferrous metals was hostage to the fortunes facing those products that used them as inputs. Prices of Australian exports were softened by slower

⁵¹ Forster, *Industrial Development*, p.224.

⁵² Thomas, 'Manufacturing', p. 267. See pp. 255-260.

⁵³ Forster, 'Economies of scale', pp. 167-8.

⁵⁴ Frank Eyre, ed, *Technology in Australia 1788-1988* (Melbourne: Academy of Technological Sciences and Engineering), 1988. See Michael E. Porter, *Competitive Strategy: Techniques for Analyzing Industries and Competitors* (New York: The Free Press), 1980, pp. 17-23.

⁵⁵ F. R. E. Mauldon, *Mechanisation in Australian Industries* (Hobart: University of Tasmania), 1938, Tables XI, XII and XIII, pp. 40 (a) and (b), 57 and 62.

⁵⁶ B. Pinkstone, *Global Connections: A History of Exports and the Australian Economy* (Canberra: Australian Government Publishing Service), 1992.

⁵⁷ For an excellent discussion see John W. Freebairn, 'Natural resource industries', in Maddock and McLean, *Australian Economy in the Long Run*, pp. 144-63.

⁵⁸ Freebairn, 'Natural resource industries', p. 146.

growth in Western Europe markets in the 1920s and by improvements in efficiency in production processes. Moreover, an excess of supply entering the world economy in the 1920s precipitated a dramatic drop in prices in 1929 and depressed them for the rest of the decade.⁵⁹

Increasing productivity in primary industries meant that demand could be met with a smaller share of resources, especially labour. Sinclair has argued that the rural frontier was closing by the 1920s.⁶⁰ This signaled the end to a century old 'model' of economic development that involved bringing more and more land into production. Declining rainfall as farmers moved inland set the geographic limits for settlement. Farming practices, particularly repeated plantings of wheat, was diminishing soil fertility. A corollary is an inelastic supply schedule with respect to price for Australian farm products after the 1920s. In contrast, Freebairn presents a more optimistic picture with a range of technical advances offsetting the caprices of nature.⁶¹ The slower expansion in area under crop in the 1930s would seem to have been the result of falling prices rather than declining marginal productivity.⁶²

A combination of low income elasticity of demand for primary products and an elastic supply response can account for a 'natural' process of long term decline in the importance of the sector in the economy. Was this process accelerated by the 'excess cost' imposed by the tariff? Insofar as farmers and miners purchased imported inputs whose prices were inflated by the tariff, the answer would be in the affirmative. However, there were a number of offsetting effects. The distribution of the 'burden' fell unevenly amongst the various agricultural and mining industries. In the late 1930s the majority of farm products exported less than a half of their output, with wool, dried vine fruits and wheat as the outliers.⁶³ Home price support schemes lifted domestic prices above export prices for a number of products, most notably dairy products, dried vine fruits, canned fruits, wine and sugar. The aggregate level of support given to the farm sector had come to exceed that received by manufacturing in 1932-33.⁶⁴ It is likely that this figure rose further as a result of the 'operation of substantial Commonwealth and State programs for special financial assistance, bounties, debt adjustment, and reappraisal of capital values and rentals of crown lands.'⁶⁵ Rural assistance may have prevented a faster outflow of resources from the farm sector in the 1930s. Moreover, the mining industries recovered their position in the economy strongly in the 1930s as a result of the

⁵⁹ Folke Hilgerdt, *Industrialization and Foreign Trade* (Geneva: League of Nations), 1945; Ingvar Svennilson, *Growth and Stagnation in the European Economy* (Geneva: United Nations Economic Commission for Europe), 1954.

⁶⁰ W. A. Sinclair, *Australian Economic Development: Old Model and New Model* (Nedlands: University of Western Australia Press), 1977. See also W. A. Sinclair, *The Process of Economic Development in Australia* (Melbourne: Cheshire), 1976.

⁶¹ Freebairn, 'Natural resource industries', pp. 136-39 & 149-53.

⁶² J. G. Crawford, C. M. Donald, C. P. Dowsett and D. B. Williams and A. A. Ross, *Wartime Agriculture in Australia and New Zealand 1939-50* (Stanford: Stanford University Press), 1954, pp. 16-20.

⁶³ Crawford, et.al., *Wartime Agriculture*, Table 4, p. 16.

⁶⁴ See note 16 above.

⁶⁵ Crawford, et.al., *Wartime Agriculture*, p.18. See also Freebairn, 'Natural resource industries', p. 138.

rising price of gold and as coal and base metals were subject to higher levels of domestic demand to generate electricity and feed the furnaces of the metal industries.⁶⁶

Services: the elephant in the room

As shown in Tables 1 and 2 above, services dominate both the farm sector and manufacturing in terms of both employment and output with shares of above 40 per cent. Students of the services sector in advanced economies, beginning with Fischer and Clark, had argued that this industry would ‘naturally’ expand relative to other sectors because of its above unity income elasticity of demand and its lower levels of labour productivity.⁶⁷ As incomes rose, consumers would spend disproportionately on services rather than foodstuffs or commodities. Moreover, the nature of production of most services, highly labour intensive and non-storable, would not permit the sorts of productivity increases occurring elsewhere in the economy. Consequently, the share of employment in the service sector would be expected to rise more rapidly than its share of product.

One of the key questions we face in discussing structural change in the Australian economy is the modest growth in services share of output and its constant share of employment. This leads to a consideration of two issues. The first is the rate at which incomes and the demand for services grew. A comparison of per capita GDP figures suggests little growth from the depression of the 1890s until World War II. Butlin refers to a ‘drastic retardation’ when compared to the earlier and later periods.⁶⁸ However, this pessimistic view has been challenged on a number of conceptual and empirical grounds by other scholars.⁶⁹ They suggest that GDP has been underestimated because the way it has been calculated fails to capture the value of the consumption of public sector infrastructure. Moreover, they point to a number of partial measures that suggest living standards had risen appreciably such as increased life expectancy, shorter working hours, earlier retirement ages, better quality housing, higher education attainments and widespread ownership of consumer durables. Factoring in the effects of alternate consumption deflators, shorter hours, earlier retirement and increased life expectancy would substantially lift the growth of per capita GDP.⁷⁰ These upward revisions make the small growth in the share of services compared to manufacturing all the more puzzling.

⁶⁶ Gold production rose from 470,000 fine ounces in 1930 to 1,650,000 in 1939. The amount of iron ore mined rose from 935,000 tons in 1930 to 2,580,000 tons in 1939. The amount of coal consumed domestically, black coal production less exports plus brown coal, rose from 11.4 million tons in 1930 to 16.8 million tons in 1939. Z. Kalix, L. M. Fraser and R. I. Rawson, *Australian Mineral Industry: Production and Trade, 1842-1964* (Canberra: Bureau of Mineral Resources, Geology and Geophysics), 1966, pp. 177, 214 and 93, 95, 106-7.

⁶⁷ For excellent surveys of the literature and data on Australian services see J. A. Dowie, ‘The service ensemble’ in Forster, ed, *Australian Economic Development*, pp. 208-65 and Michael Carter, ‘The service sector’ in Maddock and McLean, eds, *Australian Economy in the Long Run*, pp. 195-226.

⁶⁸ N. G. Butlin, ‘Some perspectives’, in Forster, ed, *Australian Economic Development*, Table 6.6, p. 284. See also, Butlin, ‘Long-run trends in Australian per capita consumption’, in K. Hancock, ed, *The National Income and Social Welfare* (Melbourne: Cheshire), 1965, pp. 1-19.

⁶⁹ Ian W. McLean and Jonathon Pincus, ‘Did Australian living standards stagnate between 1890 and 1940?’, *Journal of Economic History*, **43**, 1, 1983, pp. 193-202; Ian W. McLean, ‘Economic wellbeing’ in Maddock and McLean, eds, *Australian Economy in the Long Run*, pp. 319-43.

⁷⁰ McLean and Pincus, ‘Did Australian living standards stagnate’, Table 2, p. 201.

The second issue is whether productivity levels were lower and growth rates slower in the service sector than elsewhere? After a careful review of the issues, Carter concludes that the 'evidence does not support the conventional wisdom that service industries on the whole produce a lower output per worker and have increased their productivity at a lower rate than manufacturing or agriculture.'⁷¹ This view would again provide a partial explanation for the failure for services, particularly its share of employment, to have grown relative to the rest of the economy.

Study of changes of the composition of the service industries throw up further questions.⁷² Those industries that might be expected to have the highest income elasticity of demand and low productivity growth, the 'luxuries' of restaurants, clubs and hotels, and personal services and domestic services, stagnated or lost ground. Alternative explanations to those of income elasticity and low productivity levels are required. Carter provides two explanations of the demand for services that have differing impacts on the growth of the sector. The first involves a substitution of goods for services as the relative prices react to slower productivity growth in services. The examples given are wealthy households substituting motor cars for public transport and household durables to substitute for domestic service and entertainment. The availability of an alternate set of manufactured goods that substitute for service activity, all of which are products of the second industrial revolution, is a pre-condition for these consumption decisions whose net effect is to slow the growth of the service sector. By way of contrast, the expansion of services to businesses and government for intermediate rather than final demand purposes drove the growth of the service sector independently of income elasticity or productivity. The growth of business services in the broad was 'simply a result of increasing specialization and division of labour.'⁷³

The role of the government as a provider of services also helps to explain the size and composition of the industry. Political decisions led to increasing state outlays on service such as the provision of public administration, health and educational services, the gradual 'nationalization' of water and sewerage, power and gas, and urban transport systems. Moreover, public sector investment rose significantly compared to private non-residential investment, reflecting commitments to both rural and increasingly urban needs, infrastructure in the latter being a lagged response to population growth and industrialization.⁷⁴ However, industry classifications used by Butlin in his estimations of GDP make it impossible to distinguish between publicly and privately provided services.⁷⁵

An Alternative Explanation of Structural Change

The existing literature provides a gloomy picture of the Australian economy in the first four decades of the twentieth century. It had been subject to strong cyclical effects, two

⁷¹ Carter, 'The service sector', p.207.

⁷² Carter, 'The service sector', Table 8.5, p. 214.

⁷³ Carter, 'The service sector, p. 222.

⁷⁴ Sinclair, 'Capital formation'.

⁷⁵ Butlin, *Australian Domestic Product*, and 'Perspectives.'

depressions and a war. Moreover, its trend rate of per capita growth was disappointing. Part of the reason for this was because public policy shifted resources towards industries with lower productivity than the export oriented rural industries. Australia's competitive position in the international economy was weakened as productivity in its manufacturing was well below that of its trading partners. Insult was added to injury as the protection of manufacturing imposed greater costs on the rural industries so disadvantaging them in export markets.

An alternative view is that the Australian economy was dynamic in that entrepreneurs and business people responded to the many opportunities presented to them. Our contention is that the nature of the Australian economy was markedly different in 1939 from what it had been in 1900. The range of goods and services on offer was far wider. Changes in consumption patterns provided opportunities for firms to develop new markets, Edith Penrose's interstices.⁷⁶ The technologies underpinning production and distribution were far more advanced. Cost functions were realigned by the adoption of new technology, much of which was labour saving. Changes in demand and supply schedules across the economy prompted firms to adjust their behaviours in an attempt to lift profitability or to ward off failure. Shifts in demand and supply factors were played out in thousands of micro-markets in which firms competed. Factors exogenous to the firms were responsible for some of the shifts in both the demand and supply schedules. However, firms increasingly built the capabilities to influence the demand for their products through branding and advertising, and to create superior production technologies. The resultant effect on changes in demand and supply factors over time was reflected in a shifting in relative profitability between industries down to very narrow product categories.

Modern Consumerism

A number of powerful drivers of change can be identified on the demand side. There was a strong demonstration effect from the United States and the United Kingdom about what was on offer. Australians wanted to experience what was new and different. The 1920s in particular was a decade of experimentation. Expenditure patterns shifted under the weight of three forces: a growing demand for consumer durables; a growing preference for entertainment and leisure activities; and the emergence of a new category of expenditure, fast moving consumer goods.

Australian consumers and producers were aware of the new consumer products, particularly consumer durables, coming onto markets in North America and Europe after WWI. Immigrants brought this personal knowledge with them. Australian residents saw this 'new' world through the medium of letters from relatives living abroad, newspapers, magazines and cinema and in shop windows. They observed the purchases of their family and friends. What might have seemed unobtainable luxuries became necessities for more

⁷⁶ Edith Penrose, *Theory of the Growth of the Firm* (Oxford: Basil Blackwell), 1959.

and more families under the siren call of advertising.⁷⁷ Household budgets were rearranged in the light of an expanding set of products and services.

The decade of the 1920s has been identified as the beginning of Australia's progress to becoming 'a modern consumer society.'⁷⁸ A sufficient number of households possessed the discretionary income to purchase motor cars and a range of household appliances. Hire purchase facilities allowed the cost to be spread over a number of years. Whitwell argues that these expenditures rose rapidly in the second half of the decade before falling away in the depression and war. The extraordinary growth of consumer spending after 1945 was the start of a new era rather than a continuation of a longer process.⁷⁹ However, there are a range of indicators to suggest that the demand for consumer durables continued strongly throughout the 1930s. For instance, the sale of radios quickened markedly. In 1929 there was one radio licence for every 20 people. Within a decade the number had risen to one in six. The number of telephones in use also rose from one in every 12 people in 1929 to one in every ten by 1939. Motor car sales continued to grow throughout the 1930s. The number of motor vehicles registered, including motor cars, commercial vehicles and motor cycles, rose from one for every 12 people to one in every eight and a half. More people were driving. The number of people licensed to drive rose from one in every 43 in 1919, to one in every eight in 1929 and to one in every six in 1939. They drove further during the 1930s with the volume of petrol consumed rising faster than the number of registered vehicles, 75 compared to 50 per cent.⁸⁰

The increased consumption of motor vehicles and household consumer durables such as radios, washing machines, refrigerators, vacuum cleaners and the like necessarily lagged behind investments in the construction of sealed roads and the provision of electricity and gas. State and local governments made those investments on a large scale in the 1920s and 1930s.⁸¹ Private providers had also entered the energy sector from the late nineteenth century. A hybrid system of state and private providers continued up to WWII but the government utilities absorbed many of the smaller private firms. An increasing number of households were connected to gas and electricity. Whitwell reports that 34 per cent of homes in Australia had electricity in 1923 and that the number rose sharply later in the decade.⁸² Further growth was experienced in the 1930s. By 1939 all the electricity providers in Victoria, the SECV and the rest, had 397,944 customers, in an area that held

⁷⁷ For estimates of amounts spent on advertising through different medium see W. A. McNair, *Radio Advertising in Australia* (Sydney: Angus & Robertson), 1937.

⁷⁸ Greg Whitwell, *Making the Market: The Rise of Consumer Society* (Melbourne: McPhee Gribble Publishers), 1989, p. 3.

⁷⁹ Whitwell, *Making the Market*.

⁸⁰ Population data from Australian Bureau of Statistics, <http://www.ausstats.abs.gov/ausstats/abs@archive.nsf>. Accessed 13 November 2006. All other data from Wray Vamplew, ed, *Australians: Historical Statistics* (Broadway, NSW: Fairfax, Syme & Weldon Associates), 1987. Radio licences, SR 121-122, p. 390; Telephone subscribers, TC 160-66, p. 178; Vehicles and licensed drivers, TC 51-54, p. 171; Consumption of petroleum, ME 49-56, p. 96.

⁸¹ Butlin, *Australian Domestic Product*, Table 9, pp. 26-27; Sinclair, 'Capital formation'. See also Rob Linn, *ETSA: The Story of Electricity in South Australia* (Adelaide: ETSA Corporation), 1996; George Wilkenfeld and Peter Spearitt, *Electrifying Sydney: One Hundred Years of Energy Australia* (Sydney: Energy Australia), 2004.

⁸² Whitwell, *Making the Market*, p. 14.

85 per cent of the State's population.⁸³ The number connected was more than three-quarters of all the dwellings, shops and factories in the state.⁸⁴ The 1947 Census confirms an almost complete coverage of private houses in the metropolitan cities, 97 per cent of houses were connected to electricity. 83 per cent were connected to gas, and nearly three-quarters used a gas stove.⁸⁵ Nationwide, 78 per cent of private dwellings had electricity; just two points shy of the figure for the United States of America in 1941.⁸⁶

There was a growing market for electrical appliances which provided opportunities for local producers and distributors. A substantial electrical manufacturing industry had been established in the 1920s.⁸⁷ It continued to expand in the 1930s as sales of washing machines, vacuum cleaners, refrigerators and gas cookers and heaters continued to grow. The market was served by a combination of local manufacturers, many of whom were foreign owned, and importers. The distribution channels ranged from door to door salesmen, to specialist stores and department stores. Hire purchase or some form of vendor finance was common for the more expensive items.⁸⁸

Consumption patterns altered in the face of rising incomes, the advent of new technologies and shorter hours. More was spent on entertainment and leisure pursuits. Two illustrations suffice to make the point. First, the popular entertainments of the nineteenth century, the circus, music hall and live theatre, were challenged by the arrival of the cinema in the 1920s. The speed with which it became a mass medium is astonishing.⁸⁹ By 1927 there were 1,250 theatres that had sold 110 million tickets that year. Gross receipts were £5.5 million. Investment in the theatres was estimated to be £25 million and 20,000 people worked in the industry.⁹⁰ Sport and recreation played an increasingly important part in Australian life. School children were dragooned into organized physical activity. Participation was fostered through school, church, neighbourhood and district competitions covering every sport from archery to volley ball. Their parents might choose fishing, sailing, bowls or golf. Recreational activity became institutionalized with state and national organizations taking charge in all of the major sporting codes. Sport became mass entertainment as attendances at football matches, test

⁸³ Twentieth Annual Report of State Electricity Commission of Victoria for year ended 30 June 1939.

Appendix 9. *Victorian Parliamentary Papers 1939*.

⁸⁴ Date for the number of dwellings, factories and shops taken from *Victorian Year Book 1939* (Melbourne: Government Printer), pp. 247, 306 and 546.

⁸⁵ Census of Commonwealth of Australia, 1947, *Statistician's Report* (Canberra: Government Printer), p. 289.

⁸⁶ Ruth Schwartz Cowan, *More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave* (New York: Basic Books), pp. 93-4.

⁸⁷ Forster, *Industrial Development*, chapter V.

⁸⁸ Tariff Board Reports, 'Electric Household Clothes Washing Machines – Tariff Item 179 (D) (3) (d), 26th April 1938; 'Vacuum Cleaners', 29th June, 1938; 'refrigerators and refrigerator Parts covered by Tariff Item 176 (F) (2), 9th February 1939; 'Gas Cooking and Heating Appliances – Tariff Item 180 (C), 6th September, 1938.

⁸⁹ John Tulloch, *Australian Cinema: Industry, Narrative and Meaning* (Sydney: George Allen & Unwin), 1982.

⁹⁰ Report of Royal Commission into the Moving Picture Industry, *Commonwealth Papers Presented to Parliament*, 1926-27-28, Volume 4, pp. 14 and 22.

cricket and racing rose.⁹¹ Much of the infrastructure was provided by local government and churches. However, there were plenty of opportunities left for businessmen.⁹² The demand for sporting equipment and specialized apparel including footwear grew.⁹³ Large crowds at cricket grounds, boxing stadiums and race tracks required transport, food and drink, and at the latter, gambling facilities. Posters, tickets and programs gave additional work to printers and newspapers' sports sections feed the public's demand for results and information.

Fast moving consumer goods became an important part of expenditure patterns after WWI. Until that time the category would have been confined to a small range of products, cigarettes, pipe tobacco, toiletries and confectionery. The list lengthened in the 1920s and 1930s to include cosmetics such as face creams, lipstick, nail polish,⁹⁴ toothpaste and over the counter drugs such as 'Aspro'.⁹⁵ Confectionery also became big business as the homemade or unbranded sweets of pre-WWI were replaced by branded chocolates and toffees, and chewing gum. The soft drink market was transformed by the adoption of the crown seal and commercial refrigeration.⁹⁶ Children became important consumers in their own right, not only through their expenditures of pocket money but as a new segment in the food market. The first wave of convenience foods for breakfast, cereals, school lunches, vegemite and processed cheese, and after school and bed time snacks, ice cream, milk chocolate and cocoa came from the giant foreign food corporations of Kellogg's, Kraft, Nestle, Cadbury's and the local Peters.⁹⁷ These types of products, along with canned fruit and baked beans, came in new and improved forms of packaging.

Supply Side Shifts

The economy was also experiencing a number of important changes on the supply side that would in turn disturb existing equilibrium positions. Three will be considered briefly below. The first is the marked increase in specialization of function; the second is a

⁹¹ See entries under type of sport in Alec H. Chisholm, ed, *The Australian Encyclopaedia* (Sydney: Angus and Robertson), 1958, 10 volumes. Wray Vamplew and Brian Stoddart, eds, *Sport in Australia: A Social History* (Cambridge: Cambridge University Press), 1994; Daryl Adair and Wray Vamplew, *Sport in Australian History* (Oxford: Oxford University Press), 1997; Richard Cashman, *Paradise of Sport: The Rise of Organized Sport in Australia* (Melbourne: Oxford University Press), 1995.

⁹² Some boxing promoters, Hugh McIntosh, and SP bookies, John Wren, became millionaires. Frank Van Straten, *Huge Deal: The Fortunes and Follies of Hugh D. McIntosh* (South Melbourne: Lothian), 2004; Hugh Buggy, *The Real John Wren* (Camberwell: Widescope), 1977.

⁹³ Dunlop Australia first made a sandshoe in 1924. By 1930 half of its footwear production was for sports. It began production of the famous 'Volley' tennis shoe in 1939.

<http://www.dunlopfootwear.com.au/Volleys/default.asp>. Accessed 14 November 2006

⁹⁴ Lindy Woodhead, *War Paint: Miss Elizabeth Arden and Madam Helena Rubinstein: Their Lives, Their Times, Their Rivalry* (London: Virago), 2003.

⁹⁵ R. Grenville Smith and Alexander Barrie, *Aspro: How a Family Business Grew Up* (Melbourne: Nicholas International), 1976.

⁹⁶ Geoffrey Blainey, *Black Kettle and Full Moon: Daily Life in a Vanished Australia* (Camberwell, Vic: Viking), 2003, pp. 381-6 and 369-72

⁹⁷ Michael Symons, *One Continuous Picnic: A History of Eating in Australia* (Adelaide: Duck Press) 1982, pp. 129-33.

refashioning of distribution channels; and the third is the growing importance of intellectual property as a firm resource and as a source of competitive advantage.

The expansion of the economy in the first half of the twentieth century permitted increased specialization of function across the board. Butlin argues that the ‘gradual separation’ of the ‘institutional combination of manufacturing, trade and transport function, the confusion of rural production, construction, transport and selling activities’ was a ‘basic feature of pre-1914 and interwar growth.’ This might, *a priori*, ‘enlarge opportunities for increased efficiency.’⁹⁸ Specialization could reduce costs independent of scale as firms improve efficiency as a result of cumulative experience.⁹⁹ Evidence of the growth in specialization can be found in trade directories. Here firms advertise their wares to buyers. A review of the ‘Index to professions and trades Melbourne and suburbs’ in the *Sands & McDougall’s Directory of Victoria*¹⁰⁰ in 1920, 1930 and 1939 reveals significant change. There were 48 new categories in the 1930 edition compared to 1920, and another 218 categories in 1939 compared to 1930. The new entrants were spread across services and manufacturing. The professions splintered into highly specialist groups, particularly amongst chemists and engineers. Specialist intermediaries and wholesalers abounded, including the valuers and auctioneers making a market in second hand machinery. The list of manufacturing trades show the rapid emergence of new industries such as air conditioning, Christmas cards, gramophone records, ice cream cones and wafers, hearing aids and spectacles.

This process of specialization was particularly evident in wholesale and retail distribution. The role of the importing wholesaler, once the most important conduit between Australian retailers and their foreign suppliers, was diminishing. The tariff played its part. However, many of the larger retailers, particularly the department stores, established their own buying offices abroad.¹⁰¹ Increasingly, these large metropolitan city-based stores either integrated backwards into production or formed close links with domestic producers in relationships that exhibited considerable countervailing power. Sidney Myer’s store in Bourke Street, Melbourne, borrowing freely from models in the United States, became the pace setter for department stores in the 1920s and 1930s. New types of specialist retailer were emerging. Chain stores such as Moran and Cato in groceries, O. Gilpin’s in drapery and ironmongery, and G. J. Coles in variety goods were well advanced before 1939.¹⁰² The expanding use of the motor car brought dealerships, garages selling petrol and providing repairs, and used car lots in its wake. The general store was challenged by specialist retailers, such as grocers, Manchester, hardware and

⁹⁸ Butlin, ‘Perspectives’, p. 315.

⁹⁹ Porter, *Competitive Strategy*, pp.11-2.

¹⁰⁰ *Sands & McDougall’s Directory of Victoria* (Melbourne: Sands & McDougall), 1920, 1930 and 1939.

¹⁰¹ R. W. Dalton, *Economic and Trade Conditions in Australia to August 1929* (London: His Majesty’s Stationery Office), 1929, pp. 181-99.

¹⁰² Ambrose Pratt, *Sidney Myer: A Biography* (Melbourne: Quartet Books), 1978; Ann Blainey, *If God Prospers Me: A Portrait of Frederick John Cato* (Burwood, Vic: Chandos Publishing Company), 1990; Judith McLaughlin, *Nothing Over Half a Crown: A Personal History of the Founder of the G. J. Coles Stores* (Main Ridge, Vic: Loch Haven Books), 1991; Muriel Penny, *Just a Pocket for the Money: The History of Oliver Gilpin and His Stores* (published privately), 1995.

home wares.¹⁰³ The clothing stores segmented the market into women's and men's clothes, and youths and children. Moreover, hats, corsets, fur coats, gloves and shoes for women would be sold in different establishments. Purchases were driven by events such as parties and weddings, the changing season and fashions rather than need. New forms of food retailers started to trade in the 1930s, delicatessens, soda fountains and the soon to be ubiquitous milk bar.¹⁰⁴

Additions to capital stock have figured prominently in the explanations of output and productivity growth before WWII.¹⁰⁵ It is important to also recognize the growing importance of intellectual property to firms. Knowledge and know how was embedded in organizational routines.¹⁰⁶ Australian firms imported technology on a large scale, a process that often included the transfer of machinery, blue prints and skilled workers to assemble and train the local operatives. Examples can be drawn from steel, glass and fertilizer industries.¹⁰⁷ Businesses sought exclusive access to their own technology through patents and to imported technology and the products it could make through the licensing agreements. Products were branded and heavily promoted where ever possible. Firms registered trade marks and paid fees to foreign firms use their trade marks on products made under licence to protect their property rights. These intangible assets were a source of competitive advantage to firms and a source of barriers to entry and mobility in many industries. Further, their existence was a factor contributing to differing rates of profits between and within industries.¹⁰⁸

Changes in demand or in supply conditions had widespread repercussions across the economy. The point is most simply made with reference to motor cars and electricity. The growing demand for motor cars affected a number of up stream industries other than car companies such as oil companies, road construction contractors, suppliers of aggregate and asphalt, manufacturers and installers of tariff signals. Consumption of motor cars generated a new class of insurance risk, signaling increased competition within the insurance industry, and spurred the development of the hire purchase industry. Down stream garages sprang up to provide fuel, service and repair cars, with panel beaters and spray painters emerging as separate entities. Used car yards, wreckers and scrap metal merchants dealt with the older models. Motorists formed associations that vigorously promoted their interests against competing users of road space.¹⁰⁹ Commercial users of motor trucks, buses and cars arose apace. The truck became a major source of

¹⁰³ The Victorian government licensed all shops from 1915 onwards. The first return in 1916 divides shops into 28 categories. An 'electrical and radio' category was added in 1933. The number of shops rose from 25,635 in 1916 to 41,127 in 1938. *Annual Report of the Chief Inspector of Factories and Shops*, Victoria Papers Presented to Parliament, various.

¹⁰⁴ *Sands & McDougall's*, 1939.

¹⁰⁵ Forster, *Industrial Development*; Idem, 'Economies of Scale'; Butlin, 'Perspectives'; Sinclair, 'Capital formation.'

¹⁰⁶ This point appeals to the literature of the resource-based view of the firm.

¹⁰⁷ Helen Hughes, *Australian Iron and Steel Industry 1842-1962* (Melbourne: Melbourne University press), 1962; Diane Hutchinson, Cumming Smith; Helen Fountain, AGM

¹⁰⁸ M. E. Porter, 'The structure within industries and companies' performance', *Review of Economics and Statistics*, **61**, 2, 1979, pp. 214-27.

¹⁰⁹ Graeme Davison with Sheryl Yelland, *Car Wars: How the Car Won Our Hearts and Conquered Our Cities* (Crows Nest, NSW: Allen & Unwin), 2004.

transport in the 1930s, while bus and taxi fleets¹¹⁰ also expanded. Electricity generation had a pervasive impact on the economy. It reached back to the domestic coal mining industry as a source of energy and spawned hydroelectric schemes. Heavy engineering met its needs for both generation and transmission. Power was essential for the expansion of the telephone network, which had its own feedback loop to business productivity by reducing communication costs. Power to factories greatly increased their productivity. In the 1930s many small tools such as drills and grinders, once hand tools, were fixed to a bench and power driven. The capacity of pumps and compressors also increased.¹¹¹ Electricity transformed offices by being used for lighting, lifts, hot water systems, air conditioning, refrigeration, and to power office equipment such as calculating machines. By the late 1930s electrical appliances had invaded every room in the house. The State Electricity Commission of Victoria, for instance, boasted that there were 21 types of equipment other than lighting available.¹¹²

Conclusion

If we shift our attention from the issues of Australia's comparative advantage and its costs and productivity relative to those of its trading partners a different picture emerges. During the first four decades of the twentieth century the economy added to its stock of resources: labour, capital and technology or know how. The allocation of these resources within the economy altered significantly, manufacturing grew, the rural sector shrank by the same amount and the tertiary sector remained roughly constant. The question is what motivated this reallocation. The conventional story has been one of tariffs and subsidies interfering with relative prices. We contend that this is at best a partial explanation as it applies only to the 'tradeable' sector of the economy. The size and composition of the large tertiary sector remains unexplained. Moreover, the tariffs and subsidies story does not provide a convincing explanation of how profits in manufacturing would rise both absolutely and relatively after an increase in the tariff.

McLean and Pincus offered the tantalizing comment that 'there is the possibility that the nature of economic growth [between 1890 and 1940] was different from that in the preceding and subsequent periods of much faster growth...'¹¹³ We would agree that the process of growth is not well understood. Our contention is that new opportunities for profitable investment were becoming available in many parts of the economy because of changes on the demand and supply side. Many of these changes were exogenous to Australia. The demonstration effect was strong for both households and businesses. Information about new products and services, and the technology required to produce them flowed freely into the country. Households shifted their preferences towards consumer durables, entertainment and leisure and fast moving consumer goods. These

¹¹⁰ A fleet of 101 Yellow Cabs starting operating in Melbourne in 1923, joining the 800 independent taxis already in business. Vince Kelly, *Achieving a Vision: The Life Story of P. W. Tewksbury Australian Industrial Pioneer* (Sydney: George M. Dash), no date, 3rd ed, revised, pp. 91-99.

¹¹¹ *McPherson's Catalogue Tools and Machinery* (Melbourne), 1929 and 1937

¹¹² *Ramsay's Architectural and Engineering Catalogue* (Melbourne: Ramsay Standard Catalogue Service Pty. Ltd.), 1941 edition, section 38-3, pp. 1-24.

¹¹³ McLean and Pincus, 'Did Australian living standards stagnate', p. 196.

decisions were at the heart of Snooks'¹¹⁴ discussion of the changing boundaries between household and total economy. Up to WWII households were increasingly 'buying' goods and services that were previously produced and consumed within the family unit. Large scale investment in public infrastructure was a precondition that had been largely met by the mid-1920s. Increased profits awaited those firms first to market or who could develop a sustainable competitive advantage. Changes on the supply side such as the efficiency gains associated with specialization, new distribution channels to satisfy customer demands and a growing reliance on inimitable proprietary assets provide additional or complementary paths to profitable investments. Finally, we argue that the outcomes of these shifts in both demand and supply had large scale linkage effects across the economy.

¹¹⁴ Graeme D. Snooks, *Portrait of the Family within the Total Economy: A Study in Longrun Dynamics, Australia 1788-1990* (Cambridge: Cambridge University Press), 1994.

Table 1. Shares of employment by sector [per cent]

	Primary	Manufacturing	Services	Tertiary
1900-01	33.0	14.7	42.3	52.3
1910-11	30.5	18.8	41.1	50.7
1926-27	24.0	20.5	42.0	55.4
1937-38	23.9	23.5	42.0	52.6

Note: Mining is included in Primary. Tertiary is Services plus Construction.

Source: Dowie (1970), Table 5.4, p. 231.

Table 2: Share of product by sector at current prices [per cent]

	Primary	Manufacturing	Services	Tertiary
1900-01	36.6	12.9	42.9	50.5
1910-11	32.9	14.5	44.4	52.6
1926-27	26.4	16.4	46.6	57.3
1937-38	28.2	18.0	45.5	53.8

Notes: Data from 'Butlin' column. Mining is included in Primary. Tertiary is Services plus Construction.

Source: Dowie (1970), Table 5.5, p. 234.

Appendix 1

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.207183
R Square	0.042925
Adjusted R Square	0.030164
Standard Error	1.337281
Observations	77

ANOVA					
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	1	6.01548	6.01548	3.363759	0.070612
Residual	75	134.124	1.788321		
Total	76	140.1395			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	3.561129	1.860543	1.914027	0.059432	-0.14526	7.26752	-0.14526	7.26752
logRate	1.015745	0.553824	1.834055	0.070612	-0.08753	2.11902	-0.08753	2.11902

Appendix II

SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.96821741
R Square	0.937444954
Adjusted R Square	0.867939347
Standard Error	5657.552561
Observations	20

ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>
Regression	10	4.32E+09	4.32E+08	13.48733	0.000295
Residual	9	2.88E+08	32007901		
Total	19	4.61E+09			

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	12367.14979	1318.409	9.38036	6.08E-06	9384.702	15349.6	9384.702	15349.6
duty %	-88.1878486	124.5716	-0.70793	0.496912	-369.988	193.6128	-369.988	193.6128
bricks	-11267.4821	3800.142	-2.96502	0.01583	-19864	-2670.96	-19864	-2670.96
drugs	-4473.7254	4693.702	-0.95313	0.365418	-15091.6	6144.166	-15091.6	6144.166
metals	38326.99181	3811.946	10.05444	3.42E-06	29703.77	46950.21	29703.77	46950.21
jewelley	-11596.3988	3803.952	-3.04851	0.013826	-20201.5	-2991.26	-20201.5	-2991.26
clothing	13162.06486	3798.682	3.464903	0.007106	4568.85	21755.28	4568.85	21755.28
leather	-4111.42564	3810.575	-1.07895	0.308675	-12731.5	4508.695	-12731.5	4508.695
food	-12.2057969	3798.655	-0.00321	0.997506	-8605.36	8580.949	-8605.36	8580.949
wood	-1543.95037	3850.401	-0.40098	0.697785	-10254.2	7166.262	-10254.2	7166.262
paper	-5081.73421	3844.372	-1.32186	0.218824	-13778.3	3614.838	-13778.3	3614.838
musical instrument	13402.1343							

Chart 2. Average rate of duty on dutiable imports, 1903-39

