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## Forum

# Competitiveness in Australian Agriculture: A Review

S. Hopkins and P.E.T. Lewis\*

The concept of competitiveness develops and amplifies the older concept of comparative advantage. It is based on factors which influence domestic prices of inputs and outputs as compared with foreign competitor's prices of the same inputs and outputs. Usually national statistics of the ratio of domestic and foreign prices (adjusted by the exchange rate) are compared in the form of the real rate of exchange. The factors concerned are changes in internal and external inflation rates, changes in exchange rates, changes in productivity, changes in microeconomic efficiency, and changes in protection. In recent years the real rate of exchange for Australian agriculture has varied considerably as internal prices and costs have fluctuated about international trends. Since 1990, there has been a period of slow improvement in the real rate of exchange as the relative Australian rate of inflation has slowed down. The factors affecting competitiveness are discussed in this article.

## 1. Introduction

There is a widely held view that Australia has a comparative advantage in agricultural production (Williams). Comparative advantage in itself, however, is not sufficient to ensure long term viability. Enduring competitiveness of the Australian agricultural industry on world markets depends not only on comparative advantage but also on domestic and international economic policy. In this paper the focus will be on the broad policy issues rather than individual businesses (as in, for example, Shearer).

Measures of price competitiveness aim to explain national and international success. The most influential measures are relative price indexes. These may be represented by either changes in the real exchange rate or the nominal exchange rate adjusted for manufacturing or labour costs. Various productivity indices are also used (Hopkins and Cabalu).

The purpose of this paper is to, first, examine the concept and measurement of competitiveness. Sec-

ond, it examines trends in the competitiveness of Australia's agricultural sector according to the identified measures. Finally, factors to improve competitiveness are discussed.

## 2. The Measurement of Competitiveness

There are a number of ways of achieving international competitiveness. At the farm level, improvements in productivity, product quality, product technology and production efficiency add to the sector's competitiveness. At the economy wide level, labour market efficiency, efficiency in the production and delivery of utilities, an appropriately sized government sector and good economic management of the macroeconomy, including a correctly valued exchange rate, all contribute.

The most influential measures in the economics literature are the real exchange rate and labour productivity. Movements of the real exchange rate, from the perspective of domestic producers, represent a change in domestic and international relative prices. In addition, there are numerous domestic factors which contribute to the ability of a farm, the agricultural sector and the economy to take advantage of movements in the real exchange rate and improvements in productivity.

The contributory factors have been highlighted by the annual ranking of the competitiveness of industrialised economies by the World Economic Forum and the International Institute for Management Development (IMD). The Forum's index is based on 155 indicators;

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\* Department of Economics, Curtin University and Murdoch University, Perth respectively. Both authors are research associates of the Institute for Research into International Competitiveness of the Curtin Business School. The authors would like to thank Paula Haslehurst for her excellent research assistance, and two unknown referees.

IMD's index is based on 244 indicators. The indicators emphasise the causes of competitiveness and highlight the importance of the openness of an economy to trade and investment, the role of the government in terms of the provision of an infrastructure and the efficiency of the taxation system, the efficiency of the financial sector, and the flexibility of both the labour market and the work force. It is worth noting that Australia is ranked 12th in the World Economic Forum's ranking and 21st in the IMD ranking. By contrast, New Zealand is ranked 3rd and 11th respectively.

## 2.1 Public Policy Issues

The micro and macro economic policies adopted by a government have the ability to either enhance or stifle competition. Much of the thrust of public policy in the Australian economy in the last twenty years, such as reform of the financial system, the floating of the Australian dollar, privatisation of government services, broad-ranging microeconomic reform proposed by the Hilmer Report and taxation reform has been directed towards making the allocation of resources in the economy more responsive to changes in relative prices. That is, the emphasis of the reform is the enhancement of domestic competitiveness which, in turn, promotes competitiveness in international markets.

Government is important for the development of the infrastructure necessary for effective competition. For the agricultural sector, this includes roads and other transport modes, research and development, education, provision of a telecommunications network and a legal, institutional and regulatory framework which enhances the efficiency of the financial sector, the labour market and the overall economy. Given that it is difficult to do justice to the complexity of some policy issues, only the main public policy issues for agriculture are raised in the discussion below.

The more open an economy, the greater is its ability to benefit from competitively priced imports, and domestic producers are forced to compete with both imported goods and for a share of international markets. Australia has a history of more than a hundred years of protection from import competition and is still a relatively highly protected country in relation to other countries in terms of trade barriers. In 1987, there was a substantial across-the-board phased reduction in all tariffs, including those on textiles, clothing, footwear and motor vehicles. The main changes in trade and industry policies resulted in the average nominal rates of assistance to manufacturing falling to about 10 per

cent and the average effective tariff rate to about 14 per cent. Average tariffs of most other industrial countries are around 3 to 5 per cent (Cabalu *et al.*). The tariff rates, however, give no indication of the extent of the level of overall trade barriers. For example, Australian quarantine, health, safety and other regulations are used effectively as non-tariff trade barriers as they are by other industrial and developing economies. On the whole, Australia's non-tariff barriers tend to be more transparent than those of other economies.

On the other hand, Australia has few direct subsidies in agriculture. The extensive, and to some extent hidden, use of subsidies given to both American and some European primary producers has always been a point of contention in trade negotiations. In agricultural trade especially, Australian exporters do not face 'a level playing field' as a result.

The historic inward orientation of the Australian economy has certainly burdened primary production and made the economy inflexible and unresponsive to external change. One such inflexibility has been the failure, until recently, to establish competitive markets in manufacturing and services. Primary production in particular has been burdened by the continuing protection for manufactured goods and the lack of competitiveness of services, especially transport. Protective devices add directly to farming costs when they are applied to agricultural machinery, chemicals and fertilisers and other inputs.

Productivity in modern agriculture depends on adequate research and development. Given that research is a public good, government has a crucial role in funding basic research and development for primary production. An example is the improvement in productivity in cropping, which is the result of enormous advances in technology. The impact of genetically engineered plants and animals has not been fully felt as yet but is likely to lead to more significant improvements in productivity than in the livestock sector (Beggs and Peacock).

Although there are obviously benefits to producers from the statutory marketing bodies, their presence, in export markets in particular, is anti-competitive and not in keeping with the deregulatory thrust in the overall economy (Edwards). Consequently, the role of statutory marketing bodies in the agricultural sector is currently under review.

Competitiveness of Australian exports will be enhanced by deregulation of the labour market and the

service industries, for example, the waterfront. New Zealand agriculture has benefited from economy wide deregulation in this way (Cabalu *et al.*). In a deregulatory environment, it becomes increasingly difficult to argue for the maintenance of non-competitive structures such as producer boards and transport QUANGOS.

Environmental protection legislation which seeks to limit environmental degradation imposes costs on the agricultural sector and, therefore, reduces competitiveness in the short run. However, given that the legislation is seeking to preserve the resource base, the long run result will be an improvement in competitiveness if other countries have similar provisions (Wallace).

The Mabo legislation has created considerable uncertainty among pastoralists in Australia regarding the property rights to land which they presently farm. Sovereignty and access to tribal lands is a significant issue for the Aboriginal people of Australia. Like the environmental problem, there are obviously short term costs that may have to be borne by both the primary producers and the Australian taxpayers to resolve this complex issue. Nonetheless, a solution to the land rights issue is desirable for longer term social harmony and justice in the Australian economy. Political stability in cases like this enhances competitiveness as it provides longer term security for individuals to make production, exporting and importing decisions.

Reform of taxation can contribute to competitiveness in terms of the efficiency of the taxation system for producers and its effect on incentives (Benge). The Australian taxation system was extensively reformed in the 1980s with a reduction in both the company and personal tax rates. The political unpopularity of the broad based consumption tax, however, has left the Australian tax system still heavily dependent on personal income tax and with a distortionary and non-transparent wholesale sales tax. The distortionary impact of the wholesale sales tax is exacerbated by the fiscal imbalance between the States and the Commonwealth in Australia. There are, for example, both State and Commonwealth taxes on petrol and other fuel. Although farmers are exempt from these taxes for uses which involve primary production, the process of exemption itself imposes costs on both the producers and the taxpayers.

Finally, monetary and fiscal policy will influence agricultural competitiveness, particularly in the short term. Policies for inflation, monetary control, and foreign exchange are interdependent and have real short term impacts on all traded goods and services.

## 2.2 Productivity

Other things being equal, increased productivity adds to competitiveness. A country, an industry or a farm is, generally, more competitive when the real value of its production is greater than that of its competitors given the same inputs (EPAC). Productivity increases help determine, in turn, the ability of a country to produce a high and rising standard of living.

For national and international comparisons, total factor productivity (TFP) is the most appropriate measure of productivity in determining international competitiveness<sup>1</sup> (Ofer). It measures growth in output per unit of weighted index of labour, capital and land input. Recent work by Knopke, Strappazon and Mullen provides estimates of TFP for Australia's broadacre industries between 1977/78 and 1993/94 which summarises the main conclusions for competitiveness analysis (Table 1).

**Table 1: Australian Broadacre Productivity Growth, 1977-78 to 1993-94**

	Outputs %	Inputs %	Productivity %
<b>State</b>			
New South Wales	3.3	0.5	2.8
Victoria	1.2	-1.1	2.3
Queensland	2.8	0.7	2.1
Western Australia	3.9	0.6	3.3
South Australia	4.1	0.0	4.1
Tasmania	0.3	-1.2	1.5
All Australia	2.9	0.2	2.7
<b>Zone</b>			
Pastoral	3.1	-0.3	3.4
Wheat-sheep	3.8	0.5	3.3
High rainfall	0.9	-0.4	1.3
<b>Broadacre industry</b>			
Crops	5.0	0.4	4.6
Mixed crops-livestock	4.3	1.1	3.2
Sheep	1.5	0.5	1.0
Beef	1.9	0.3	1.6
Sheep-beef	0.0	-2.1	2.1

**Source:** Knopke, Strappazon and Mullen.

<sup>1</sup> Largely because of the work of economists at the Australian Bureau of Agricultural and Resource Economics (ABARE), there has been considerable work on TFP in Australian agriculture (Lawrence and Mackay; Lewis, Martin and Savage).

Clearly, the greatest increases in productivity have been in cropping industries. According to Knopke *et al.*, productivity increases were due to better rotation practices, higher yielding crop varieties, greater use of fertilisers and adoption of minimum till practices. In addition, there has been considerable capital saving over time. Over the period 1977/78 to 1993/94, the real value of farm machinery, buildings and structures fell by 2.5 per cent per year. Materials, particularly chemicals, but also seed, fodder, fuel and fertiliser, have been substituted for capital. Productivity growth has been moderate, by comparison, in the remaining agricultural sectors.

In all broadacre industries, there has been a long term trend towards a fall in the number of small farms and the growth in larger farms through acquisition or merger (Ockwell). Knopke *et al.*, show that productivity growth is greatest among larger farms and, with the shift in resources to larger farms, there has been further increases in productivity for the sector as a whole. Another long term factor is the fall in employment in agriculture as capital and materials have been substituted for labour (Lewis).

### 2.3 The Real Exchange Rate

Measures of competitiveness in the macroeconomics literature have traditionally focussed on the real exchange rate (Shone). External competitiveness has traditionally been defined in terms of the movement of the real exchange rate where the real exchange rate is based on deviations from purchasing power parity (PPP)<sup>2</sup>:

$$(1) \quad R_p = E/p^*$$

where  $R_p$  is the real exchange rate,  $E$  is the nominal exchange rate, the foreign currency price of a unit of domestic currency, and  $p$  and  $p^*$  are the domestic and foreign price level, respectively. As long as PPP holds, the real exchange rate is constant. Theoretically, changes in domestic or foreign prices lead to changes in competitiveness. For example, a fall in the domestic price level, with no corresponding change in the nominal exchange rate or the foreign price level, decreases the value of the real exchange rate. This reduces the cost to foreigners of commodities denominated in domestic currency, and increases the foreign demand for domestically produced goods. A reduction in  $R_p$ , or a real exchange rate depreciation, implies an increase in competitiveness. Since PPP is a long term adjustment process, actual measures of the real

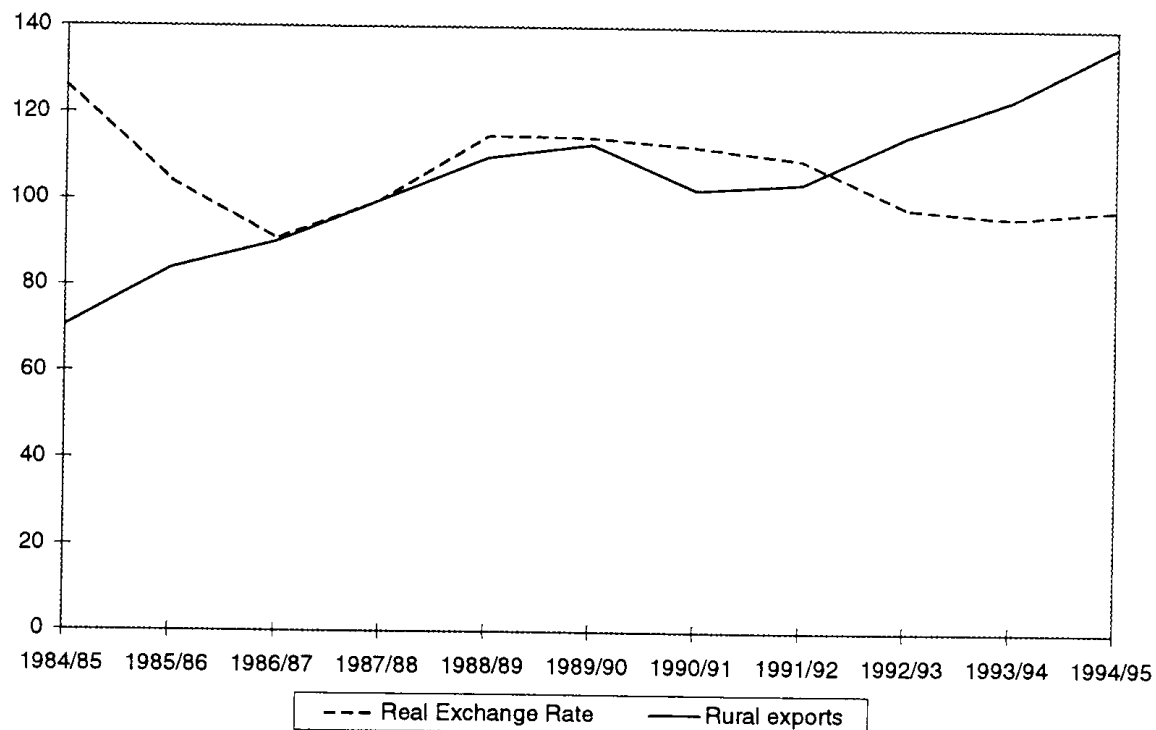
exchange rate fluctuate considerably, and longer term trends should be examined for changes in competitiveness.

For Australia as a whole, the real exchange rate has risen and fallen by 20 percentage points in recent years. In the early part of the 1980s (the Australian dollar was floated in international currency markets in December 1983), the rate fell as domestic prices and costs were lower than international price and costs (Figure 1). This increase in competitiveness in the early floating period was reversed in 1986 when competitiveness decreased due to higher costs and wages in Australia than in its major trading partners. From 1989, the Australian inflation rate fell and stabilised in concert with international price and cost trends.

In theory, the agricultural export sector should have performed better in the period before 1986 when the real exchange rate was falling, and after 1989 when it fell more slowly. Annual data will not allow an exact measure of the response as farm supply adjustment can be spread over several years. There is an overall upward trend in real exports over the period (Figure 1). The improvement in competitiveness associated with the fall in the real exchange rate in the early 1980s does coincide with an improvement in real exports up to 1989. For the latter part of the period, real exports increase again from 1992, suggesting some lag in the supply response. There are other factors apart from changes in competitiveness that may have led to the observed changes in real rural exports which would bear further supply analysis.

It is interesting to note the effect of exogenous changes in exchange rates on foreign currency earnings. The elasticity of supply is about 0.1 for the agricultural sector as a whole (Garnett) and, therefore, a ten per cent depreciation in the Australian dollar, on the basis of 1995/96 rural exports of \$A21,203m would have increased the value of exports of the Australian rural sector by \$A2,354m other things being equal.

<sup>2</sup> Purchasing power parity refers to the relationship between the domestic currency and foreign and domestic price levels. In the absence of trade barriers, tax distortions and significant transport costs, the price level in the foreign country will be equal to the exchange rate adjusted price level in the domestic economy. This is the absolute version of PPP where arbitrage between countries will quickly eliminate any price differences in different markets. In the relative version of PPP, given an initial base period exchange rate, the equilibrium rate at some later date will reflect the relative rates of inflation in the two countries.

**Figure 1: Real Exchange Rate and Rural Exports, Australia**

Notes: The real exchange rate is nominal trade weighted exchange rate adjusted for inflation differentials between Australia and Australia's major trading partners. Rural exports are the value of rural exports in 1987/88 prices expressed as a percentage of the real value in 1987/88.

Source: ABARE (various years).

It is important to note that a change in the real exchange rate does not lead to a significant immediate or even medium term change in output. Furthermore, the responsiveness of the domestic currency price of imports (including farm inputs) to changes in the exchange rate requires a degree of competitiveness in the domestic economy. Price increases may not be passed on to consumers in a competitive economy and price decreases may not be passed on in an uncompetitive economy. Recent work by Dwyer suggests that most of the Australian economy (the non-tradable sector) is not oriented to international trade and, therefore, price decreases which should follow a depreciation are not passed on to farmers. Moreover, it should be emphasised that the real exchange rate measures price or cost competitiveness. Non-price competitiveness, includ-

ing quality and reliable delivery, is an important determinant of demand. Arndt suggests that 'non-price competitiveness supplements but does not supplant price competitiveness'.

It is likely that the longer term impact of a depreciating nominal exchange rate may be deleterious to the domestic economy. Arndt notes that any improvement in price competitiveness attributable to a nominal depreciation of the currency is temporary. After a period of approximately two to three years the price competitiveness will be eroded by a higher relative rate of domestic inflation which will raise the costs of imports, particularly for rural producers and, hence, reduce competitiveness.

## 2.4 Internal Competitiveness

A measure of international competitiveness usually associated with the Salter and Swan 'Australian' model is *internal* competitiveness, defined as the ability of the domestic traded goods sector to attract resources from the non-traded goods sector. The real exchange rate ( $R_r$ ) is based on the ratio of the domestic prices of traded to non-traded goods:

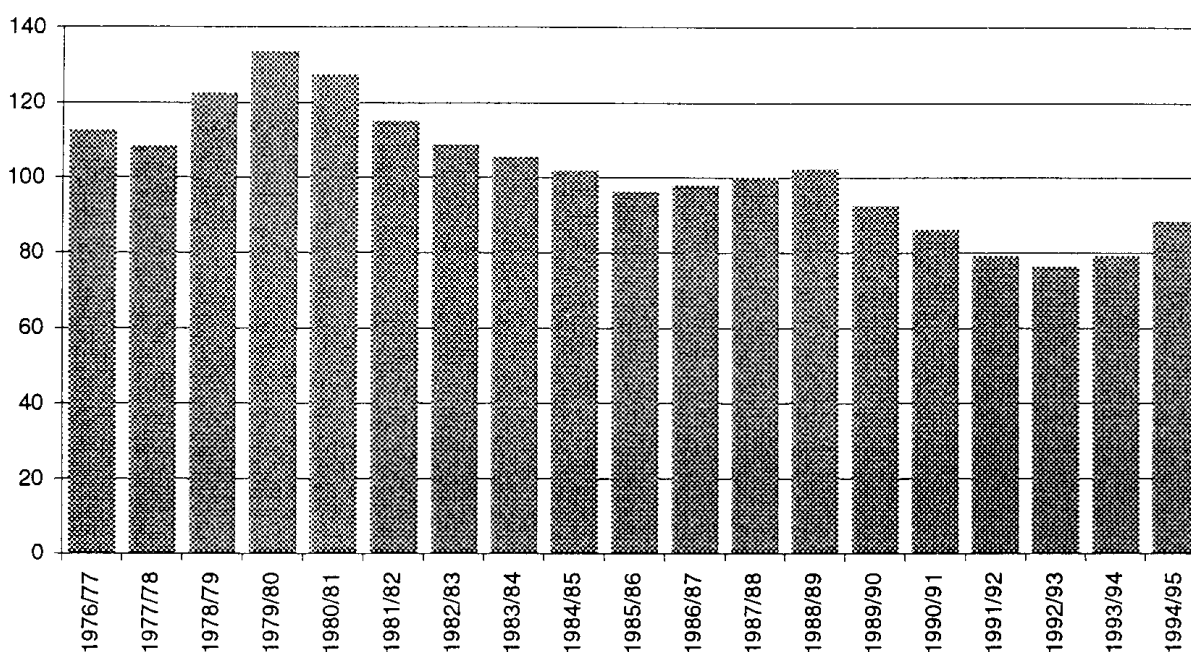
$$(2) \quad R_r = p_n/p_t$$

where  $p_n$  and  $p_t$  are the domestic price of goods in the non-traded and traded goods sectors, respectively. This can be described as a real exchange rate in the sense that changes in relative prices generate real effects on the allocation of resources between the traded and non-traded goods sectors. An increase in the relative domestic price of traded goods causes  $R_r$  to fall - there is a real depreciation. The higher relative price of traded goods, *ceteris paribus*, suggests in-

creased profitability in the production of such goods and encourages a flow of resources into the traded goods sector and away from the non-traded goods sector.

Figure 2 shows farm product prices relative to the price of all goods produced in the economy proxied by the GDP deflator. Basically, the greater relative farm prices the more competitive is the farm sector. The general fall in relative farm prices over the period from 1976/77 indicates that resources would flow from the agricultural sector to other industries in the economy where price relativities are more favourable. The significant fall in relative farm prices in the early 1980s was reflected in a relative fall in the contribution of agriculture to GDP and a stagnation in real exports (Figure 2). After a brief recovery between 1985/86 and 1988/89, the farm sector suffered another downturn in competitiveness through to 1992/93 when the relativities improved markedly again. The improve-

**Figure 2: Relative Farm Prices, Australia**



Note: Relative farm prices are the ABARE index of prices received by farmers divided by the GDP deflator and expressed as an index with 1987/88 = 100.

Source: ABARE (various years).

ment in agricultural competitiveness from 1992/93 is consistent with the improvement in real exports from this period as well.

## 2.5 Unit Costs and Real Exchange Rates

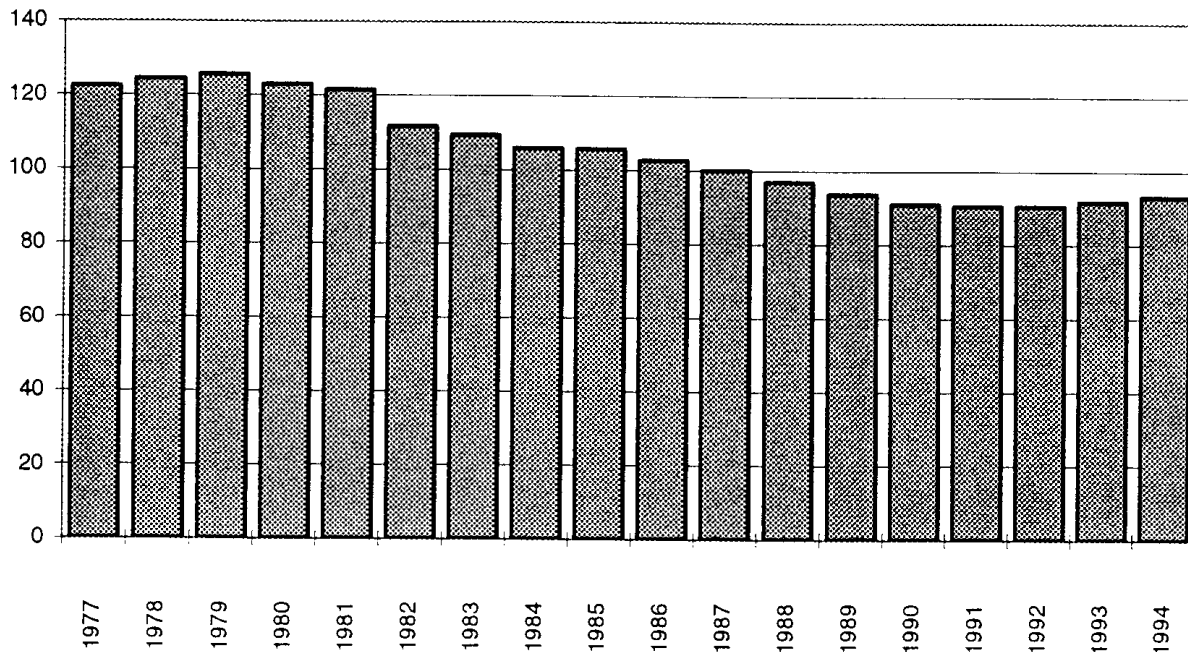
Shone has formally established the relationship between the traditional microeconomic and macroeconomic measures of competitiveness. In summary, improvements in price competitiveness arise if:

- (a) the nominal exchange rate depreciates;
- (b) domestic wages are rising less than foreign wages;
- (c) domestic productivity is rising more than foreign productivity;
- (d) the domestic markup of prices over marginal cost falls more (or rises less) than the foreign markup.

The reverse holds for reductions in competitiveness.

It remains to discuss unit costs (wages) and markups in relation to competitiveness. The differential between domestic and foreign wages is important as wages are an important component of total costs. However, for agriculture, because labour comprises only a small proportion of farm costs, *it is the impact of wages on costs of other inputs which makes relative wages important* (Lewis). Most of the 1980s and early 1990s were characterised by very moderate wages claims in Australia, attributable mainly to the Accord (see Lewis *et al.*, 1994). The downward trend of the relative wages shown in Figure 3 indicates a competitive gain in terms of *lower input costs* facing Australian farmers over the period under review. Indeed, in some ways, wage costs may be taken as a substitute criteria for relative total costs.

Figure 3: Australian Wages Relative to the United States



Note: Relative wages are the ratio of Australian average hourly earnings to US average hourly earnings expressed as an index with 1987/88 = 100.

Source: DX Database.



The issues of productivity differentials and price mark-ups are interrelated. The productivity growth in Australian broadacre agriculture, discussed earlier, is partly endogenous and partly due to the necessity for Australian farmers to respond to falling long term terms of trade. Because Australian producers, at least in the broadacre industries, behave like perfectly competitive firms, they are prevented from asking prices above marginal cost and must increase productivity to survive as an alternative. The protectionist policies of large producers such as the European Union, the United States and Japan are well documented (see for instance, Lewis *et al.*, 1994). Over time, support over competitive prices has tended to shield their farmers from the need to become more productive. In addition, markup margins work through the market channel from producer to final consumer hence the lack of competitive pricing *increases* the differential between domestic and foreign margins. The question for the future in Australian agriculture is the extent to which the reduction in markup opportunities resulting from freer trade will be compensated for by productivity growth. To the extent to which productivity does not keep pace with falling markups, then Australian farmers will become less competitive.

### 3. Summary and Discussion

A number of factors that influence competitiveness have been considered in this paper, but the real exchange rate has a pivotal role in promoting competitiveness in the agricultural industry. It would be tempting, therefore, to suggest that macroeconomic policy should be used, somehow, to effect a depreciation of the exchange rate in order to improve competitiveness through changing price relativities. However, this can only be effective in the short run since a currency depreciation arising from a slackening of monetary policy will eventually be eroded by increased prices for farmers' inputs through inflation.

It should be concluded, therefore, that macroeconomic policy should be used for macroeconomic stabilisation rather than as an instrument to improve competitiveness. Furthermore, since the agricultural sector is particularly affected by exchange rate and interest rate shocks, this suggests that monetary policy should not be the subject of unpredictable and frequent shocks such as that which took place in 1989. Such a view suggests that policy should address the real factors such as productivity and impediments to free trade both overseas and in Australia if this is possible.

On the international front, the 1993 GATT agreement on agriculture should substantially increase Australia's overall competitiveness in agricultural trade. By reducing protection, particularly in the US, EU and Japan, prices in world agricultural markets and internal costs should increase. Thus, prices received by Australia's farmers relative to competitors will increase from both factors. The big winners will be Australia's beef producers who will gain an estimated \$340m a year in exports by 2001. Other sectors to enjoy major gains are wheat (\$90 million), coarse grains (\$90 million), dairy products (\$125 million), sheep meat (\$20 million) (Lewis *et al.*, 1994).

Domestic protection has been known to be responsible for reducing the competitiveness of Australian agriculture for some time (Industry Commission). The tariffs on imported manufactured goods reduce competitiveness of the agricultural sector by increasing the prices of manufactured imports to agriculture. In addition, with protection the exchange rate is kept artificially higher than it would otherwise be. The overall effect is to lower prices received relative to prices paid and shift resources out of agriculture through reduced internal competitiveness. The tariff reductions announced in the late 1980s and early 1990s are estimated to be worth an average \$2700 per farm. The current Productivity Commission hearings may well produce recommendations for further reductions in domestic protection.

Microeconomic reform is another important issue for farmers. Over 40 per cent of the wholesale price of agricultural goods is accounted for by marketing costs and margins. Clearly, if the costs of transportation and marketing from the farm gate to the customer could be reduced, there would be a substantial increase in farm incomes. Arrangements such as labour practices on the waterfront and the over-staffing of the railways are obvious costs which must be borne by producers. State regulations which make it necessary for farmers to use the state transport system are also a major impediment to farmers' competitiveness and a major element of farmers' costs.

Although the late 1980s and early 1990s saw major developments in microeconomic reform, particularly in marketing arrangements, there is still much more which could be done, particularly given the stimulus to economy wide competition from the Hilmer report. As in the past, most of the adjustment to competitive pressures is likely to be at the farm level. To the extent that substitution is possible, farmers may be moving

resources from meat and particularly wool, into crops, where prospects are better. Since crop production is where productivity improvements are the greatest this substitution will further increase overall productivity. The increase in crop production has resulted in a significant rise in investment in new plant and equipment further stimulating productivity (Knopke). It remains true, of course, that the farm sector can only benefit from improvements in competitiveness right through the market channel to final consumer.

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