WORLD AGRICULTURAL TRADE DISTORTIONS – MEASUREMENT AND RECENT TRENDS*

by Agnes Walker
Industries Assistance Commission (IAC),
Canberra, ACT, 2616

Abstract

The paper presents estimates of the domestic price distorting effects of various countries' agricultural policies. It shows that high and disparate levels of government support prevail in several countries of importance to Australia, but notes that significant information gaps exist, especially in relation to the policies of major developing and centrally planned economies. The paper illustrates how the non-tariff nature of much of the support provided insulates farmers from the international environment, shifting the burden of adjustment to other, less assisted producers.

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CONTENTS

1. INTRODUCTION

Government support to agricultural production, and the ensuing trade distortions, have come to the forefront of international debate in recent months. Perhaps the most visible manifestation of concerns about rising agricultural protectionism has been the rapid escalation of trade tensions.

In some countries there has been increasing recognition of the high domestic costs of such policies. For example, early last year the President of the United States said that a:

> 'high priority in 1987 must be to reform our agricultural programs. Besides costing taxpayers $34 billion this year alone, these programs divert land, labor and other resources from their most productive uses'[1]

For all OECD countries taken together, agricultural support in the mid 1980s has been estimated to have cost consumers and taxpayers well over US$100 billion a year.[2] Much of this was due to the policies of the EC. Despite concerns about high costs, however, few OECD countries have altered their agricultural policies to any significant extent.

As far as centrally planned and developing countries are concerned, their governments have continued to tightly control agricultural production and trade, although border taxes and controls have been relaxed in a number of smaller developing countries.

Proposals to liberalise agricultural trade have recently been put within the forum of the Uruguay round of multilateral trade negotiations. In conducting such negotiations, it is generally believed that some measure of the extent to which government policies distort agricultural trade is required.

One widely used measure of the first round impact of government policies concerns the estimation of the domestic price distorting effects of various countries' agricultural packages. Such country by country estimates are often seen as a first step in assessing the international

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1 President of the US, Economic Report To Congress, January 1987.
2 OECD Observer, 'OECD Farmers and Agricultural Policies', August/September 1987, p. 5.

trade implications of world agricultural protection. Examples of where information on domestic price distortions has been used as input into such global analyses are numerous. They include a study by the OECD concerning its member countries' agricultural policies, a study commissioned by the World Bank on the effects of developed country policies on the developing world, and a recent analysis by the IAC on the implications of other countries' agricultural policies for Australia.[2] With the exception of the latter, these analyses relied on data covering the period of the late 1970s or early 1980s.

2. PURPOSE, SCOPE AND STRUCTURE OF PAPER

2.1 Purpose

The subject of this paper is an assessment of the first round effects of agricultural policies in terms of their impact on domestic prices. Thus, the paper is mainly concerned with the way in which various countries' agricultural policies - policies which are often extremely complex - can be reduced to their domestic price effects. Over the past decade or so, several organisations have published estimates of this kind. Such estimates are however often dated and have limited country coverage.

One objective in preparing this paper has been to bring together a coherent and up-to-date set of estimates of the domestic price distorting effects of agricultural policies, covering as many countries as possible. Other objectives have been to illustrate the way these effects vary across countries and over time, and to provide some explanation as to why the level of support provided in some countries tends to fluctuate significantly over time.

The coherent and up-to-date set of estimates presented in this paper is expected not only to provide a useful basis for future analyses of the international effects of agricultural interventions, but also to indicate the areas where further research is needed on estimation of the

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3 See:
- OECD, National Policies and Agricultural Trade, 1987;
- World Bank, World Development Report, 1986; and
- IAC, The Wheat Industry, forthcoming.

domestic price distorting effects of agricultural policies.

2.2 Scope

The scope of the paper is limited to seven agricultural food commodities. All are of some importance to Australia. While, in terms of country coverage, the scope of the paper is broad, attention has been focussed on those countries' policies which are likely to have greatest impact on world markets.

2.3 Structure

The structure of the paper is as follows. Section 3 describes the nature of agricultural interventions. This is important because, when calculating domestic price effects, different forms of interventions will need to be treated differently. In section 4, the techniques used for estimating these price effects are described and a consistent set of estimates for 30 countries and country groupings is presented. Section 5 examines variations in the estimates across countries and section 6 discusses why the estimates are likely to fluctuate considerably over time. Finally, a concluding section summarises the insights gained from the paper.

3. NATURE OF AGRICULTURAL INTERVENTIONS

The most important characteristics of commonly used agricultural interventions are their complexity, lack of visibility and their non-tariff nature. Their price and quantity effects are often difficult to disentangle, both in any one year and over time. Unlike ad valorem tariffs, which allow domestic prices to respond to external influences, many agricultural interventions insulate domestic markets from adverse changes in the international environment. Adjustment in countries which adopt such policies is often delayed for long periods of time, and much of the burden of adjustment is shifted onto countries pursuing more open trading policies.

The proliferation of non-tariff barriers generally has caused concern in international circles. UNCTAD and the World Bank estimate that about a sixth of industrial country imports from developing countries are now

controlled by non-tariff barriers, such as prohibitions, quotas, 'voluntary restraints' by exporters and discretionary import licensing. Overall, the use of such measures is estimated to have increased by almost 25 per cent since the end of the Tokyo Round.

It is beyond the scope of this paper to present a comprehensive list of agricultural interventions currently in place throughout the world.[4] However, the major forms of support measures directly affecting trade are detailed below.

3.1 Policies Characteristic Of Developed Countries

Through the work of a number of organisations, such as the UN's Food and Agricultural Organisation (FAO), the World Bank, the OECD, the US Department of Agriculture (USDA), and Australia's Bureau of Agricultural Economics, the agricultural policies of many developed countries have been listed, described and evaluated in terms of their costs, both domestically and internationally.

3.1.1 Market price support

A number of countries pursue policies which effectively maintain domestic prices more or less constant, regardless of changes in the international environment. Such policies tend to create a wedge between domestic and border prices, especially at times when world prices follow a declining trend, or when domestic currencies are revalued. Price support policies are currently in place in the EC (eg for grains, dairy products, beef, sheepmeat, sugar), Japan (for around 80 per cent of agricultural production, including rice, wheat, and beef), Canada (eg for grains), Australia (eg for tobacco) and a few developing countries (eg India for wheat, rice, sugarcane and cotton, and Korea for rice and barley).

Complex administrative mechanisms are needed to implement policies which support domestic prices. First, domestic prices have to be set

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4 A country by country description of agricultural policies can be found in: US Department of Agriculture, Trade Policies and Market Opportunities for US Farm Exports - 1986 Annual Report.

administratively for each commodity subject to price support, and imports have to be stopped from 'flooding in' at times when the domestic price is set above the world price. In the EC, this is achieved through specific import levies which need to be adjusted frequently - daily in the case of grains - to ensure that import prices faced by consumers are at all times above those of domestically produced substitutes. Second, export subsidies may be required to dispose of surpluses. The rate of subsidy will need to be changed frequently to ensure that producers face the same price for the commodity, regardless of whether it is destined for domestic or export markets. Export subsidies of this kind currently operate in the EC.

3.1.2 Deficiency payments and guaranteed prices

An important characteristic of the market price support mechanisms described above is that they rely on consumers for financing the support provided to farmers. In cases where governments prefer taxpayer (ie budget) financing, they generally opt for deficiency payment or guaranteed price schemes.

Deficiency payments schemes generally involve the government guaranteeing a certain level of producer prices, regardless of the changes that may take place in the international environment. Deficiency payments are made directly to farmers and do not alter market prices. While such payments have a similar effect to market price support schemes as far as producers are concerned, they have the dual advantage of not distorting consumer choices and not requiring complex import and export controls. Examples of deficiency payments schemes can currently be found in the US (eg for grains), and Japan (eg for milk and oil seeds).

3.1.3 Production controls and subsidies

By raising producer prices above world prices, both the above price support schemes have tended to encourage production. In countries where such schemes apply, supply has grown well beyond demand, as less efficient producers still earnt enough to remain in the industry and efficient farmers produced more. As a result, governments have been forced to accumulate large stocks of surplus products.

A range of 'corrective' policies have been introduced in an attempt to resolve the problem of over-production. These can be grouped under the headings of 'production controls' and 'export subsidies'.

Among the most widely used production control measures are various forms of acreage retirement programs. These have been a feature of US farm policy for several decades. Some countries have introduced production quotas (for example Japan for rice and Australia for milk), while others have preferred multipart pricing systems. Examples of the latter are the EC's levies on milk products.

None of these controls have been particularly successful in controlling or eliminating over-production.[5] Governments had to find other ways of resolving the problem of imbalances created through price support schemes. Some have sold part of their excess stocks at prices below world prices. Such actions however have tended to invite strong protest or retaliation from competitors. The Export Enhancement Program introduced by the US in 1985 is one such example. This program, through which sales are made to specified destinations at prices well below those generally obtained for US exports, has attracted a great deal of adverse publicity internationally.

Overall, no government measure has to date been successful in countering the undesirable side effects of agricultural price support schemes. In this context the OECD is of the view that 'more market oriented policies are called for if the sector is not to collapse under the weight of its own surpluses and is to adjust to a more rational mode of economic behaviour.'[6]

3.2 Policies Characteristic Of Developing And Centrally Planned Economies

Many developing and centrally planned countries pursue self-sufficiency goals and adjust their agricultural trade policies accordingly. Often

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5 OECD Observer, 'Cutting Swath Through Farm Subsidies And Surpluses', December 1987/January 1988.

6 Ibid.

they are concerned about conserving foreign exchange and keeping basic food prices low. The agricultural policy packages they adopt tend to reflect these concerns.

Because many are not members of the GATT, there are no international fora within which the effects of their trade policies can be discussed. Indeed, although several centrally planned and developing countries are among the world's largest food producers, relatively little is known about their agricultural policies and the effects of these on international markets. Even when information is available on the policies themselves, a reliable estimate of their price distorting effects may not be possible, due to the artificial setting of official exchange rates.

3.2.1 Export and import prohibitions

Few countries are in a position to fully prohibit agricultural exports and imports, but several developing countries appear to have come close to this situation. In countries such as India, Pakistan and Egypt, only basic essential agricultural products are imported and this only to offset domestic shortfalls. Products declared essential are often imported solely by the Government. Emphasis is generally placed on importing raw products in order to conserve foreign exchange. In Thailand, imports of a range of agricultural products are banned, including rice and sugar.

Although more latitude is allowed for exports, exports of farm commodities are often closely regulated by developing countries. In India, for example, such exports are controlled by quotas, duties, state trading and minimum export prices, in order to ensure adequate supplies on the domestic market. Although there are some exceptions, exports of Indian wheat, beef, dairy products, oil seeds and vegetable oils are generally prohibited. While at any one point in time such measures may not restrict trade significantly, their continued existence represents considerable potential for limiting international agricultural trade flows.

Imports and exports are also highly regulated in centrally planned economies. Their policies are discussed in section 3.2.3.

3.2.2 Export and production taxes/consumption subsidies

Some developing countries tax agricultural production or exports, and subsidise consumption, in order to raise revenue and maintain low domestic prices for essential food items. India's and Pakistan's policies for wheat, rice and sugar follow this pattern. High debtor developing countries with similar policies, such as Argentina and Brazil, are currently in the process of reducing or eliminating such taxes and subsidies, in response to suggestions by the World Bank.

3.2.3 Government trading

Tight import and export controls in developing countries are often achieved through state trading (see section 3.2.1). For example, in Egypt, government trading firms have a monopoly for exporting 19 agricultural commodities and, in India, the few agricultural commodities considered essential are imported solely by the Government.

Government trading, however, is more often associated with centrally planned economies. In such economies, government priorities largely determine levels of trade. Imports tend to be inhibited not only by state trading, but also by lack of foreign exchange. Imports of high value goods are generally discouraged and those of raw materials and technology oriented products encouraged. In China, for example, the Government exerts special control over the trade of staple commodities, such as corn, rice, sugar, wheat and cotton. However, China encourages imports of breeding stock and improved seeds. State trading and hard currency requirements also affect agricultural trade by the USSR. In that country, preference is given, through bilateral or counter-trade agreements, to satellite or Block partner suppliers (eg China for corn, cotton and soybeans, Hungary for wheat and processed food). The USSR however has long term grain agreements with a number of developed countries, such as the US, Canada and France.

Neither China nor the USSR are members of the GATT, although China is applying for membership.

3.3 Inter-relationship between sectoral policies

It is now generally recognised that there are significant inter-relationships between developed countries' protection (eg of their most vulnerable manufacturing industries, such as textiles) and developing and centrally planned country imports from the developed world. This is because the amount of hard currency such countries can obtain depends significantly on the opportunities available to them to export to developed countries.

These inter-relationships are particularly important to Australia. This is partly because developing and centrally planned economies are major buyers of Australian agricultural products, and partly because Australia itself is protecting its domestic market from developing country imports.

4. MEASUREMENT

Many of the above listed agricultural interventions distort domestic prices relative to the world price. For example, price support schemes financed through consumer taxes raise domestic producer and consumer prices. Revenue raising through export taxes lower producer prices. In response to distorted domestic price signals, production and consumption patterns, as well as world trade, are altered.

An assessment of the extent to which domestic prices change as a result of government intervention is a first step in evaluating the production, consumption and trade effects of agricultural policies. Measurement of these domestic price distortions is the focus of the rest of this paper.

Although in many instances it is difficult to reduce a complex set of interventions to their 'simple' price effect, several organisations have done so, generally for purposes of across industry or across country comparisons. Most measures used to date are able to indicate both consume and producer price distortions, that is the extent to which the prices received by local producers, or paid by local consumers, are different from the chosen world reference price.

Section 4.1 describes the most commonly used measures internationally, while section 4.2 focusses on those measures which are the subject of

this paper. Section 4.3 discusses the difficulties associated with choosing an appropriate world reference price.

4.1 Producer And Consumer Subsidy Equivalents

Internationally, the most commonly used summary measures are the Producer Subsidy Equivalent (PSE) and the Consumer Subsidy Equivalent (CSE). These measures have been used by organisations such as the FAO, the World Bank, the OECD and the USDA.[7] Because these organisations' PSE and CSE estimates form the basis for a significant part of the quantitative material presented in this section, their methods of calculation are described below.

4.1.1 Definition

The OECD defines the PSE as the payment that would be required to compensate farmers for the loss of income resulting from removal of a given policy measure. The CSE is defined as the implicit tax on consumption resulting from a given policy measure, plus any direct consumption subsidies.[8] These definitions are similar to those adopted by other organisations.

In practice, the per unit PSEs and CSEs measure the difference between the post-subsidy wholesale prices received by producers, or the post-tax wholesale prices paid by consumers, and the chosen world reference price. The post-subsidy price received by producers may or may not differ from the domestic market price. An example of the former case is when the subsidy is entirely budget financed. Market price support schemes are an example of the latter.

In their percentage form, the PSEs and CSEs are generally expressed as

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7 See for example:
Josling, T.E. 'Agricultural Protection And Stabilisation Policies' FAO Mimeograph, October 1975;
World Bank 'Methodologies For Measuring Agricultural Price Intervention Effects', Staff Working Paper No 394, June 1980;
US Department of Agriculture, Government Intervention In Agriculture, 1987; and
OECD National Policies And Agricultural Trade, 1987

8 OECD, ibid.

the ratio of the per unit PSE or CSE to the relevant domestic market price. It will be seen later that this ratio is different from that presented in this paper (ie an estimate of the extent to which producer and consumer prices differ from the world reference price, rather than from the domestic market price).

4.1.2 Method of calculation

While in some cases one or two forms of interventions dominate, in most instances PSEs and CSEs will need to be obtained by evaluating the combined effects of various elements of a particular policy package.

An assessment of the domestic price effects of these packages is not possible without a knowledge of the forms of various countries' agricultural interventions. Some forms of support affect market prices, while others only influence the prices received by producers. Some affect both producers and consumers, while others only have an impact on producers. For some, measurement of the domestic price effects is relatively simple, while for others it is extremely complex. An example of the former is the case where support to producers is financed solely through consumer taxes, raised through an ad valorem tariff. In that case calculation of the CSE in percentage form is simple, since it is determined by the tariff rate.[9] No knowledge of either the domestic consumer price, or the world reference price, is required. Examples in the latter category are policy packages which comprise not only market price support measures, direct subsidy payments and production control measures, but also a range of product specific concessions - such as rebates on transport charges - and various subsidies to inputs and to value adding factors. Complex packages of this kind present considerable measurement problems, even in cases where comprehensive statistics are readily available.

Because the method of calculating PSEs and CSEs depends on the form of the intervention used, and because consistent and comprehensive data series are not readily available for many countries, estimation of the domestic price distorting effects of various countries' agricultural

9 In such a case, the CSE in percentage form is given by t/(1+t), where t is the tariff rate.

policies is a time consuming process. In addition, the estimation procedures rely, of necessity, on judgments. Despite these difficulties, the orders of magnitudes and the time trends estimated by various organisations, are generally quite similar.

4.1.3 Extent of policy coverage

The interventions generally covered in PSE/CSE calculations are:

- market price support;
  - including two price systems, import and export measures (eg tariffs, quotas, export credits and voluntary export restraints), home consumption schemes, supply control measures and the activities of marketing boards;

- direct income support;
  - including deficiency, storage, acreage and disaster payments;

- indirect income support;
  - including concessional credit and input subsidies;

- other support;
  - including research and training grants, transport and tax concessions and marketing support.

This coverage is well suited to the policies of developed countries. For these, the effects of market price and direct income support schemes generally dominate. The contributions to the measured price distortions of schemes falling under the other two headings - ie indirect income support and other support - is in most cases small.

The coverage however is less well suited to the policies of developing and centrally planned economies. For example, the effects of government trading, bilateral arrangements, export and import prohibitions and counter-trade are not considered. While there are good reasons why the coverage of the interventions has, to date, been limited - one being the near impossibility of evaluating the price distorting effects of measures such as government trading and import or export prohibitions -

it will be important to bear these omissions in mind when assessing the estimates of domestic price distortions presented in later sections.

4.2 Ratios Of Producer/Consumer Prices To Border Prices

In this paper, two measures similar to the PSEs and CSEs are used. They are the ratios of the post-subsidy prices received by producers, and the post-tax prices paid by consumers, to the world reference price. For both these, measurement takes place at the border. The producer to border price ratios are closely related to a summary measure generally used by the Industries Assistance Commission, that is the nominal rate of assistance on outputs.[10]

The chosen world reference price is the border price (see section 4.3). Whenever possible, the domestic producer price has been calculated as the world reference price plus the producer subsidy equivalent per unit of production, and the consumer price as the world price plus the consumer tax equivalent per unit of consumption. Both the producer price and the consumer price are compared with the same world reference price.

Although designed to ensure a wide range of domestic objectives - such as food security, the realigning of farmers' incomes with other sectors in the economy or, in some developing countries, foreign exchange controls - the driving force of most countries' agricultural policy packages is a desire to boost farm incomes. In other words, the most important element of the policy settings will generally be described by the producer to border price ratio. If financed through the budget, the support thus provided will not alter consumer prices and the consumer to border price ratio will simply be 1.00. If financed through consumer taxes however - eg through a tariff on imports in cases where imports and similar locally produced items are close substitutes - the consumer

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10 The main difference between these two measures is that, in addition to the forms assisting output (accounted for in the Commission's nominal rate estimates), the producer to border price ratios also take account of forms assisting inputs (eg fertiliser subsidies) and value-adding factors (eg adjustment assistance). For a definition of the nominal rate used by the Commission, see:
IAC. Assistance To Agricultural And Manufacturing Industries, June 1977, Chapter 1.

to border price ratio will be above 1.00.

In analyses of the international trade implications of domestic interventions, there is need to specify the price relativities which affect producer and consumer decisions. The domestic to border price ratios presented in later sections of this paper are suitable indicators of the relative prices which guide such decisions.

4.3 World Reference Price

The difficulty of choosing an appropriate world reference price has been discussed in numerous publications.[11] In making such a choice, it is important to bear in mind both the conceptual and the measurement difficulties that are likely to arise. Conceptually, the reference price should be the price that would prevail in international markets, had all government interventions been removed. In practice, however, the reference point chosen is often a price observed in existing - and thus distorted - markets, since statistics on undistorted markets are unavailable. Once a particular price is chosen as reference, there are invariably significant difficulties of measurement. There is the problem of considerable fluctuations over time, of data relating to quotations rather than to actual prices paid, and of inconsistencies between the international and domestic statistics..

For purposes of this paper the chosen world reference price is the observed border price. Border prices have been measured as the unit value of imports (cif) for importing countries, and the unit value of exports (fob) for exporting countries.[12] Reference prices have been

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11 See for example:
Haszler H. and Parsons D. 'The Price Adjustment Gap And World Agricultural Policy Reform', Quarterly Review Of The Rural Economy, Bureau Of Agricultural Economics, June 1987.

12 In cases where transport costs are not negligible, it is important to compare domestic and border prices at the same geographical location, ie at the wharf of the country under consideration. This is the reason why the border price for importing countries is chosen as the unit cif import price, while for exporting countries it is chosen as the unit fob export price. For this paper, the FAO trade data series was used to calculate unit import and export prices, whenever applicable.

calculated in a similar manner by others.[13]

The advantage of such a reference price is that it relies on values actually paid for imports or received for exports rather than on quotations or spot prices. Its use can, however, present difficulties in some instances, for example when the commodity composition of the trade classifications does not match that of the corresponding domestic price series data. In several such instances other data, such as quotations or spot prices, had to be taken as the reference price.

5. DISPARITIES ACROSS COUNTRIES

This section brings together a coherent set of estimates of domestic to border price ratios for a range of countries (see section 4.2 for a description of these ratios). Use is made of previously published work, whenever possible. In interpreting the estimates presented, it is important to bear in mind the measurement difficulties, as described throughout section 4.

In this section, descriptions of the country coverage of the estimates, the data base used, and the timeframe of the study, are followed by presentation and interpretation of the domestic to border price ratios.

5.1 Country Coverage

The policies of thirty countries or country groupings have been considered (see Table 5.1 for a listing). The aim was to cover most countries in the world. Care has been taken to separately identify all countries or country groupings that are important to world agricultural production, consumption or trade. The EC comprises the ten countries which were members of the Community in 1986, that is Belgium, Denmark, France, the Federal Republic of Germany, Greece, Ireland, Italy, Luxemburg, Netherlands and the UK.

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13 See for example:
OECD, 'Up-dating Of PSE/CSE Analysis - EEC', Note by the Secretariat, 3 september 1987; and
Tyers R., background papers the World Bank's World Development Report 1986.

TABLE 5.1 : DOMESTIC TO BORDER PRICE RATIOS

(a) RATIOS OF PRODUCER TO BORDER PRICES : 1986[a]

	Rice	Wheat	Coarse Grains	Sugar	Dairy Products	Ruminant Meats	Non-Ruminant Meats
1. AUSTRALIA:[a]	1.15	1.05	1.00	1.20	1.55	1.05	1.00
2. NEW ZEALAND:	1.00[b]	1.00[b]	1.10[b]	1.00[d]	1.45[b]	1.25[b]	1.20[b]
3. CANADA:	1.00[b]	1.25[b]	2.60[b]	1.25[b]	3.70[b]	1.15[b]	1.20[b]
4. UNITED STATES:	7.65[c]	1.90[c]	1.75[c]	2.70[b]	2.00[b]	1.15[b]	1.05[b]
5. EC:	3.65[b]	1.80[b]	1.15[b]	3.15[b]	2.10[b]	2.70[b]	1.25[b]
6. SPAIN & PORTUGAL:	1.15[f]	1.35[f]	1.30[f]	1.65[f]	1.75[f]	1.65[f]	1.10[f]
7. EFTA:	1.00[f]	1.65[f]	1.55[f]	1.55[f]	2.45[f]	2.30[f]	1.40[f]
8. USSR:	1.05[f]	0.90[f]	0.95[f]	1.40[f]	1.70[f]	1.10[f]	0.90[f]
9. JAPAN:	6.60[b]	10.00[b]	10.70[b]	3.05[b]	3.20[b]	2.55[b]	1.10[b]
10. KOREA, REP. OF:	3.05[d]	1.10[d]	2.35[d]	4.20[d]	2.00[e]	3.25[d]	1.30[d]
11. TAIWAN	1.70[d]	3.00[d]	1.60[d]	3.45[d]	1.50[e]	1.55[d]	1.10[d]
12. CHINA:	0.90[d]	1.50[d]	1.30[d]	1.15[d]	2.90[d]	0.75[d]	0.70[d]
13. INDONESIA:	0.85[d]	1.00[d]	0.95[d]	1.40[d]	1.60[f]	1.80[f]	2.00[f]
14. PHILIPPINES:	1.00[d]	1.00[d]	1.00[d]	1.00[d]	1.70[f]	1.00[d]	1.25[d]
15. THAILAND:	0.75[d]	1.00[d]	0.95[d]	0.90[d]	1.60[f]	0.95[f]	1.00[d]
16. BANGLADESH:	0.95[f]	1.00[f]	1.00[f]	0.60[f]	1.30[f]	0.90[f]	0.90[f]
17. INDIA:	0.85[e]	0.70[e]	1.00[f]	0.80[f]	1.50[f]	1.00[f]	1.00[f]
18. PAKISTAN:	0.75[f]	0.90[f]	0.90[f]	0.70[f]	1.65[f]	1.00[f]	1.00[f]
19. ARGENTINA:	0.80[f]	0.85[c]	0.70[c]	0.85[f]	0.85[f]	0.85[c]	0.90[f]
20. BRAZIL:	1.50[b]	2.00[e]	0.95[e]	0.75[f]	1.05[e]	0.95[e]	1.05[e]
21. MEXICO:	0.90[f]	1.50[e]	2.00[e]	0.70[f]	2.35[f]	1.00[f]	1.20[f]
22. CUBA:	0.80[f]	0.70[f]	0.80[f]	0.50[f]	0.90[f]	0.60[f]	0.65[f]
23. EGYPT:	0.50[f]	0.60[f]	0.70[f]	0.65[f]	1.60[f]	1.50[f]	1.50[f]
24. NIGERIA:	0.95[e]	1.50[e]	1.05[e]	0.70[e]	2.30[f]	1.95[f]	1.70[f]
25. SUB-SAHARAN AFRICA:	1.00[f]	1.05[f]	0.95[f]	0.55[f]	1.20[f]	0.75[f]	0.75[f]
26. SOUTH AFRICA	1.00[f]	1.60[f]	1.15[f]	0.90[f]	2.05[f]	1.10[f]	1.00[f]
27. OTHER EAST EUROPE:	1.35[d]	1.05[d]	1.25[d]	1.90[d]	2.65[d]	1.45[d]	1.00[d]
28. OTHER ASIA	0.75[f]	0.85[f]	0.95[f]	0.75[f]	1.30[f]	0.90[f]	0.80[f]
29. OTHER LATIN AMERICA	0.90[f]	1.00[f]	1.00[f]	0.85[f]	1.50[f]	0.90[f]	1.00[f]
30. OTHER NORTH AFRICA & MID EAST	1.20[f]	1.20[f]	1.20[f]	1.00[f]	1.80[f]	1.00[f]	1.00[f]

(b) RATIO OF CONSUMER TO BORDER PRICES : 1986[a]

		Rice	Wheat	Coarse Grains	Sugar	Dairy Products	Ruminant Meats	Non-Ruminant Meats
1	AUSTRALIA:[a]	1.35	1.15	1.00	1.80	1.75	1.00	1.00
2	NEW ZEALAND:	1.00[b]	0.95[b]	1.00[b]	1.00[b]	1.10[b]	1.00[b]	1.05[b]
3	CANADA:	1.00[b]	1.20[b]	2.10[b]	1.05[b]	1.80[b]	1.00[b]	1.05[b]
4	UNITED STATES:	0.95[c]	1.05[c]	1.00[c]	1.50[b]	1.30[b]	1.05[b]	1.00[b]
5	EC:	2.45[b]	1.55[b]	1.10[b]	3.10[b]	1.50[b]	2.35[b]	1.20[b]
6	SPAIN & PORTUGAL:	1.15[f]	1.35[f]	1.30[f]	1.65[f]	1.75[f]	1.65[f]	1.10[f]
7	EFTA:	1.00[f]	1.65[f]	1.55[f]	1.55[f]	2.45[f]	2.30[f]	1.40[f]
8	USSR:	1.05[f]	0.90[f]	0.95[f]	1.40[f]	1.70[f]	1.10[f]	0.90[f]
9	JAPAN:	5.65[b]	2.85[b]	1.80[b]	2.00[b]	2.35[b]	2.40[b]	1.10[b]
10	KOREA, REP. OF:	3.60[d]	3.10[d]	1.00[d]	4.20[d]	2.60[e]	4.35[d]	1.30[d]
11	TAIWAN	1.85[d]	1.40[d]	1.20[d]	4.55[d]	1.50[d]	1.85[d]	0.95[d]
12	CHINA:	0.80[d]	1.35[d]	1.25[d]	1.75[d]	2.00[d]	0.75[d]	0.70[d]
13	INDONESIA:	1.00[d]	1.70[d]	0.95[d]	1.40[d]	1.60[f]	1.80[f]	2.00[f]
14	PHILIPPINES:	0.85[d]	1.00[d]	1.40[d]	1.25[d]	1.70[f]	1.10[d]	1.10[d]
15	THAILAND:	0.75[d]	1.00[d]	0.95[d]	1.00[d]	1.60[f]	0.95[f]	1.00[d]
16	BANGLADESH:	0.90[f]	0.90[f]	1.00[f]	0.60[f]	1.30[f]	0.90[f]	0.90[f]
17	INDIA:	0.95[e]	0.85[e]	1.00[f]	0.80[f]	1.50[f]	1.00[f]	1.00[f]
18	PAKISTAN:	0.75[f]	0.90[f]	0.90[f]	0.70[f]	1.65[f]	1.00[f]	1.00[f]
19	ARGENTINA:	0.80[f]	0.85[c]	0.70[f]	0.85[f]	0.85[f]	0.85[f]	0.90[f]
20	BRAZIL:	0.80[f]	1.05[f]	0.90[f]	0.75[f]	1.25[f]	0.80[f]	0.90[f]
21	MEXICO:	0.90[f]	1.00[f]	0.95[f]	0.70[f]	2.35[f]	1.00[f]	1.20[f]
22	CUBA:	0.80[f]	0.70[f]	0.80[f]	1.00[f]	0.90[f]	0.60[f]	0.65[f]
23	EGYPT:	0.50[f]	0.60[f]	0.70[f]	0.65[f]	1.60[f]	1.50[f]	1.50[f]
24	NIGERIA:	0.95[e]	0.85[e]	0.70[e]	0.70[e]	2.30[f]	1.95[f]	1.70[f]
25	SUB-SAHARAN AFRICA:	1.00[f]	1.05[f]	0.95[f]	0.55[f]	1.20[f]	0.75[f]	0.75[f]
26	SOUTH AFRICA:	1.00[f]	1.60[f]	1.15[f]	0.90[f]	2.05[f]	1.10[f]	1.00[f]
27	OTHER EAST EUROPE:	1.35[d]	1.05[d]	1.25[d]	1.90[d]	1.90[d]	1.45[d]	1.00[d]
28	OTHER ASIA:	0.75[f]	0.85[f]	0.95[f]	0.75[f]	1.30[f]	0.90[f]	0.80[f]
29	OTHER LATIN AMERICA:	0.90[f]	1.00[f]	1.00[f]	0.85[f]	1.50[f]	0.90[f]	1.00[f]
30	OTHER NORTH AFRICA & MID EAST:	1.20[f]	1.20[f]	1.20[f]	1.00[f]	1.80[f]	1.00[f]	1.00[f]

a Some data are only available on financial year or crop year basis. These have been adjusted to line up with the 1986 calendar year, whenever possible.

b Update by IAC for 1986, based on published statistics on exchange rates and on border prices. Domestic prices have generally been assumed to remain at their 1985 level (as estimated by the OECD).

c Update based on comprehensive statistics for 1986.

d Based on USDA estimates of PSEs or CSEs for 1984. It is assumed that the estimates are valid for 1986.

e Based on USDA estimates of the ranges of PSEs or CSEs applying over the period 1982 to 1984. The IAC estimates for 1986 are based on the mid-point of the range quoted by the USDA.

f Tyers' estimates for the period 1980 to 1982. It is assumed that the estimates are valid for 1986.

* For Australia, estimates of assistance have been derived using a methodology consistent with that for other countries. The producer to border price ratios are the total assistance measured by the Commission from all forms (ie outputs, value adding factors and inputs), expressed as a proportion of each industry's unassisted value of output. The consumer to border price ratios are the proportional difference between the comparable domestic and export prices.

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5.2 Data base

5.2.1 Sources for previous estimates

In order to estimate the domestic to border price distortions resulting from various countries' agricultural policies, use was made of other organisations' estimates whenever possible. The main sources of information were the estimates published by the OECD – available up to 1985 in some cases–, the USDA – for the 1982 to 1984 period – and Tyers and Anderson – for the 1980 to 1982 period (see Table 5.1 for source references).

5.2.2 Updates for 1986

Because of general concern about rising agricultural protectionism, especially since 1985, it was considered important to obtain figures that were more up-to-date than what had been published so far. Thus, for the purposes of this paper, an effort has been made to up-date earlier estimates for the more important countries and for all seven agricultural commodities. The latest year for which the up-dates were possible was 1986.

- major countries

For most countries, border prices for 1986 were obtained from published statistics (see section 4.3). The main difficulty in carrying out the up-dates, therefore, centred around the finding of suitable statistics for the calculation of the relevant domestic prices.

For countries for which detailed information on the 1986 policy settings were available, such as the US, the up-dated post-subsidy producer prices and the post tax consumer prices could be directly calculated.

For countries or country groupings with market price support schemes, such as Japan or the EC, a knowledge of the characteristics of such support schemes was used in obtaining the desired up-dates. For these countries, the 1986 up-dates were in part based on the OECD's 1985 estimates. Because the primary aim of market price support schemes is

to maintain producer prices more or less unchanged, it was assumed that producer prices in 1986 - in the country's own currency - remained at their 1985 level. Variations in the producer to border price ratio between 1985 and 1986 then arose from changes in border prices (in $US) and changes in the exchange rate (relative to the $US). Published statistics for these latter variables are available for 1986. (An example of this type of calculation is presented in section 6). Similarly, knowledge of how the producer subsidies are financed, has allowed the up-dating of the consumer to border price ratio.

The above two methods were the main ones used in up-dating the domestic to border price ratios for most countries of some importance, and for all seven commodities covered in this paper.

- other countries

For countries which were thought to have lesser impact on international agricultural markets, or in cases where the data necessary for the up-date were unavailable, the latest published estimates were taken as indicators of the domestic to border price distortions prevailing in 1986. It was felt that such indicators were useful for purposes of across country comparisons, provided that it could be assumed that the price distorting effects of the relevant policies have not altered much over time. Depending on the form of the intervention and on the extent to which governments may have altered the basic policy settings, such an assumption could be either reasonable, or quite off the mark. Unfortunately, for many such countries and commodities there is no way of knowing whether the 'no change' assumption is reasonable or not.

5.3 Timeframe

In order to 'smooth out' fluctuations over time, it has become traditional for agricultural studies to use data averaged over a three year period. Although this practice has not been followed in this paper, it is not unreasonable to view many of the 1986 estimates as indicators of the 1985 to 1987 averages. This is because, for several major countries and commodities, the domestic to border price gap has trended upward over this period. The reasons for the general upward trend are discussed in section 6.

5.4 Results

Table 5.1 details the 1986 consumer and producer to border price estimates for thirty countries or country groupings. Although the estimates are presented as domestic to border price ratios, it is easy to deduce from these the subsidy or tax equivalents of various countries' policies. For example, the producer to border price ratio of 1.90 for wheat in the US indicates a producer subsidy equivalent of 90 per cent, while the figure of 0.70 for India suggests a 30 per cent producer tax. Both these are relative to the world reference price. Similarly, the consumer to border price ratio of 3.15 for sugar in the EC implies a 215 per cent consumption tax, while the figure of 0.75 for Brazil implies that the policies of that country effectively subsidise consumers to the extent of 25 per cent.

In interpreting the estimates presented in Table 5.1, it should be remembered that both the available data and the estimation methods are heavily biased toward developed countries' policies. It is not possible at this stage to obtain reliable estimates of the price distorting effects of many policies characteristic of developing and centrally planned economies (section 3). It should be also remembered that several of the figures presented are estimates for years earlier than 1986 (section 5.2).

Despite these qualifications, it is possible to draw a few important conclusions from the estimates presented in Table 5.1. These are as follows:

- subsidies to agricultural production are particularly high in certain developed countries. In cases where the subsidies are consumer financed, consumption taxes are also very high
  - for example, for Japan, the EC and the US, subsidy equivalents of 100 per cent or more were not uncommon in 1986;

- while the policies of some developing countries, such as Korea and Taiwan, tend to follow the developed country pattern, developing and centrally planned economies are more likely to effectively tax

production and subsidise consumption

- such taxes and subsidies have been estimated to range between 10 and 50 per cent;

- nearly all countries or country groupings subsidise the production of dairy products and finance this through consumption taxes
  - in 1986, subsidies and taxes of 50 per cent or more were not uncommon, encouraging dairy production and discouraging dairy consumption world wide;

- for other commodities, the mix of tax/subsidy equivalents is more evenly spread, some countries taxing, others subsidising production;

- there are considerable disparities between the level of tax/subsidy effects across countries, and across those commodities which are substitutes in production or in consumption;
  - such disparities are likely to distort production and consumption decisions and significantly alter trade shares.

6. TRENDS OVER TIME

In considering the domestic price distorting effects of agricultural policies, it is important to remember that, for many countries, these effects will vary significantly over time due to the non-tariff nature of their agricultural interventions. With such interventions, it is possible for domestic to border price ratios to fluctuate considerably, even at times when agricultural policy settings remain unchanged.

Table 6.1 details the process through which such fluctuations take place for wheat in the EC. Four price ratios are shown for the period 1982 to 1986. The first is the actual producer to border price ratio. The other three indicate what that same ratio would have been, had certain variables remained unchanged over the period. The variables held constant are the exchange rate ($US/ecu), the price received by producers after all government measures had been taken into account (in ecu/t), and the world reference price (in $US/t). The first ratio provides an indication of the extent to which the nominal rate of assistance to EC wheatgrowers varied over the period, while the other three indicate the importance of particular variables in bringing about

TABLE 6.1: PRODUCER AND BORDER PRICES – EUROPEAN COMMUNITY, WHEAT

	1982	1983	1984	1985	1986**
(1) Price received by producers*					
(a) in ecu/t	212	221	211	203	203
(b) in $US/t	208	197	167	154	199
(2) Price received by producers*					
(a) exchange rate remaining at its 1982 level $US/t	208	216	207	199	199
(b) producer price in ecu/t remaining at its 1982 level, $US/t	208	189	167	161	216
(3) Border price					
(a) Actual in $US/t	141	159	147	99	113
(b) Constant 1982 level	141	141	141	141	141
(4) Domestic to border price ratios					
(a) Actual (1b)/(3a)	1.48	1.24	1.14	1.56	1.76
(b) 1982 exchange rate (2a)/(3a)	1.48	1.36	1.41	2.01	1.70
(c) 1982 producer prices (2b)/(3a)	1.48	1.19	1.14	1.63	1.85
(d) 1982 world price (1b)/(3b)	1.48	1.40	1.18	1.09	1.41
Exchange rate, $US/ecu	0.98	0.89	0.79	0.76	0.98

* Including direct and indirect subsidies.
** IAC estimates.
NOTE: for purposes of this Table, the EC is comprised of the ten countries which were its members in 1986. These are listed in section 5.1.

SOURCES: OECD, Updating PSE/CSE Estimates, AGR/TC/WP(87) 6,3 Sept. 1987.
IMF, International Financial Statistics, 1987 (yearly averages for calendar years).
FAO, Trade Year Book, various issues.

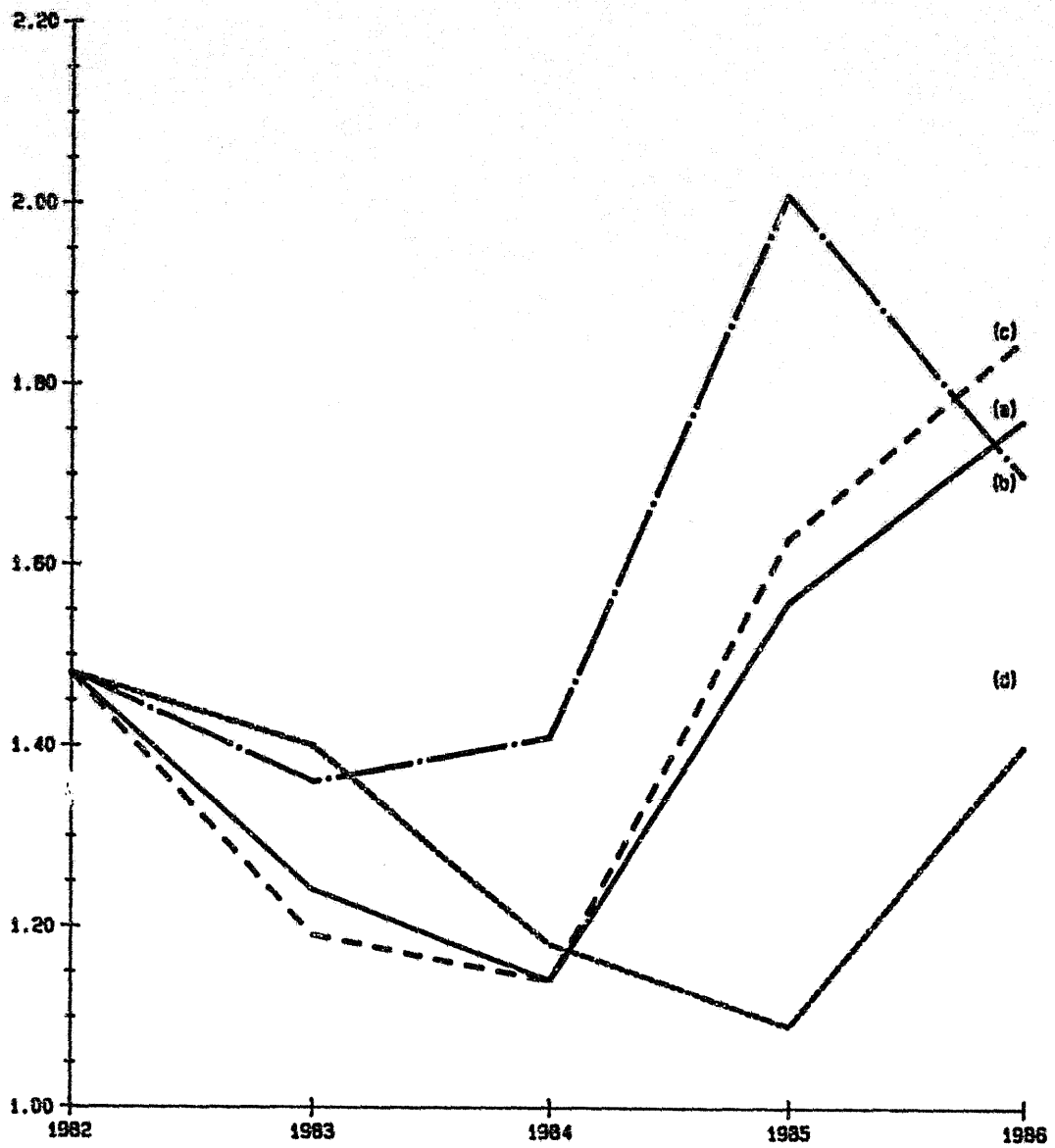
these changes.

It can be seen from Table 6.1 that the price received by EC producers (in ecu/t) has varied by less than 5 per cent from its initial 1982 level. By contrast, the actual domestic to border price ratio changed from its initial value in the order of ± 20 per cent over the period, indicating that significant changes in assistance have taken place within the framework of the EC's longstanding price support policies. While the policy settings (eg in terms of the administratively determined 'intervention' price) have been relatively stable, external factors, such as the world price or the exchange rate have altered greatly. This led to considerable fluctuations in the level of support provided EC wheatgrowers over the period. In other words, EC wheat policies have insulated their farmers from international market changes, shifting the burden of adjustment to less protected wheatgrowers in other countries.

The four producer to border price ratios are graphed in Figure 6.1. Comparisons of graph (a), which depicts the actual situation, with the other graphs shows that domestic prices (in ecu/t) have only made a small contribution to the changes in assistance that took place over the period. That is, graphs (a) and (c) remain close together throughout the period. By contrast, changes in the world reference price and in the exchange rate have both made important contributions (graphs (b) and (d)).

Between 1983 and 1985, these two variables had an opposite influence, the decline in the world reference price placing an upward pressure on assistance and the depreciation of the ecu relative to the $US exercising a downward pressure. The net effect of these two influences has varied over these two years, with assistance declining in the first and increasing in the second.

FIGURE 6.1: PRODUCER TO BORDER PRICE RATIOS - WHEAT IN THE EC



(a) Actual
(b) Exchange rate remaining at its 1982 level
(c) Producer price in domestic currency remaining at its 1982 level
(d) World refernce price remaining at its 1982 level

SOURCE: Table 6.1.

Between 1985 and 1986 these two variables once again had opposite influences, the EC's world reference price increasing and its exchange rate appreciating significantly against the $US. The effects of the exchange rate changes dominated, since assistance increased in that period. Further assistance increases are expected between 1986 and 1987, due to continuation of the upward movement of the ecu against the $US at a time when world wheat prices changed relatively little.

The above example only concerns producer support measures for one commodity in one country grouping – wheat in the EC. It is nevertheless a good illustration of the mechanisms through which the insulating properties of several countries' agricultural policies manifest themselves. Similar tables could have been prepared for most other commodities in the EC, and for wheat in the US, Japan or Canada.

While quite different in nature, many interventions characteristic of developing or centrally planned economies could also be shown to have similar insulating effects. In particular, fluctuations in assistance levels over time would take place in countries which have introduced import or export prohibitions, import or export quotas, or have engaged in state trading. The reasons for the fluctuations would be similar to those detailed in the EC example, that is maintenance of domestic prices in the face of changing world prices and exchange rates.

Overall, despite the exceptions that could easily be enumerated, it seems reasonable to conclude that an essential feature of world agricultural interventions is that they provide variable and often 'tailor-made' assistance over time.

7. CONCLUDING REMARKS

The paper presented evidence that high and disparate levels of government support prevail in several countries of importance to Australia's agricultural trade. It showed that the non-tariff nature of much of the support provided acts to insulate certain farmers from the international environment, shifting the burden of adjustment to other, less protected, producers. It also highlighted significant information gaps, especially as far as developing and centrally planned economies were concerned.

The findings of this paper have several implications both internationally and for Australia.

First, within the current round of GATT negotiations, it would seem worthwhile to pay at least as much attention to the form of agricultural support measures as to their levels. This is because the adverse effects of certain interventions arise as much from their form as from their level. For example, many of the non-tariff forms of support currently in place create an expectation among local producers that governments will at all times insulate them from unfavourable developments in international markets. In addition, the complexity of such schemes and the encouragement they provide for over-production often leads to the 'piling up' of costly administrative controls, one on top of another. Domestic prices have to be set, subsidies or import and export controls need to be administered, abnormally high stocks are to be managed, ways and means to dispose of excess stocks have to be found and, finally, production controls may need to be introduced. Replacing such regimes with simpler support schemes, and with ones that allow domestic prices to follow world prices, would clearly be a significant improvement.

Second, in any round of trade negotiations it would be important to consider government support to all sectors simultaneously. This is because there are significant inter-linkages across countries, and across sectors within countries. An example of the former is the limit that certain countries' exports place on the extent to which they are able to import. It is well known that the amount of hard currency that developing and centrally planned economies - many of which are major buyers of Australian agricultural products - can obtain depends significantly on the opportunities available to them to export to developed countries. However, such opportunities are often limited by developed countries protecting their 'vulnerable' manufacturing industries. The importance of these inter-relationships has been recognised by Australia's Prime Minister in his recent Geneva speech. In that speech, the Prime Minister said that Australia was prepared to negotiate a broad package of measures - including tariffs, quantitative restrictions, licensing and embargo arrangements applying to

manufactures – as part of a broad-based multilateral approach.[14]

Third, it would be important for Australia to obtain more information on the policies of its major current, or potential, agricultural trading partners – ie centrally planned and developing economies, such as the USSR, China, India and countries of the Middle East. Although many of these follow extremely restrictive agricultural policies, little is known of the trade effects of their government interventions. Even if the impact of such restrictions were not significant at present, there are no reasons why this should remain so in future. Tight trade restrictions are more than likely to inhibit imports at times when improved living standards place an upward pressure on import demand (as well as on domestic demand). Because few of these countries are members of the GATT, there are no international fora within which such trade issues can be discussed.

14 Prime Minister, Speech to Contracting Parties to the GATT, Geneva, 22 October 1987, p 9.