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Toward Freer Trade
Strategies and Experiences
in
Pacific Agricultural Reform

Edited by
Doren D Chadee and Allan N Rae

Proceedings and Papers for the
Fourth Workshop of the
Agricultural, Trade and Development Task Force of the PECC

Bangkok, 4 – 6 June 1990

Published by
Centre for Agricultural Policy Studies
Massey University, Palmerston North
NEW ZEALAND

November 1990
ACKNOWLEDGEMENTS

The Thailand National Committee for Pacific Economic Cooperation, and its Chairman Dr Thanat Khoman, played a major role in the administration of this Workshop. Their efforts are gratefully acknowledged. Dr Thanat Khoman also graciously accepted an invitation to open the Workshop with an address to participants. Thanks are also due to Dr Narongchai Akrasanee and Dr Tanasak Wahawisan of the Thailand Development Research Institute for their individual assistance as well as that of their Institute, in making the Workshop a success.

Financial assistance from the PECC Central Fund towards the travel costs of some participants is gratefully acknowledged.

A grant from the New Zealand Ministry of External Relations and Trade greatly facilitated New Zealand’s role as a coordinator of this Task Force, and is also gratefully acknowledged.

Mrs K.J. Fisher and Mrs D.B. Braden worked long and hard in producing the final typescript; their efforts are greatly appreciated.

Allan N. Rae
Task Force Coordinator
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The Task Force on Agricultural Policy, Trade and Development of the Pacific Economic Cooperation Conference (PECC) held its fourth Workshop in Bangkok in May 1990. This Task Force had its origins in a study programme set up by the PECC in 1985, to consider policy issues related to livestock and feed grains.

The Task Force's commodity coverage has been expanded since then and its original objectives of examining national policy priorities, the benefits and costs of past and current policy measures and the analysis of alternative approaches emphasising cooperation, has placed the Task Force in a strong position to contribute to current international debate on trade liberalisation in agriculture. Previous full conferences of the PECC had stressed the urgency of bringing the Uruguay Round of trade negotiations to a successful conclusion, and this has influenced the design of the work programme of this particular Task Force.

The Task Force reported to the seventh PECC conference in Auckland late in 1989 that the Round should not be portrayed as seeking to reduce the incomes of farmers. Rather, the objective is to obtain a gradual reduction in protection and a challenge is to identify alternative mechanisms to provide support to farmers where deemed necessary.

The Fourth Workshop of the Agricultural Policy, Trade and Development Task Force took up that challenge, and several papers made proposals for trade policy reform and for alternative approaches to supporting the farm sector that will be less trade-distorting than many currently used. Other papers presented to the Workshop provided information on the often considerable progress that individual PECC economies have already made in liberalising their agricultural and other sectors. Governments around the Pacific Rim are increasingly recognising the rewards of deregulation, and many have moved unilaterally. Cooperative reductions in protection are required, however, if these gains are to be fully realised.

Part I of the book includes four chapters that deal with proposals for trade reform. The Uruguay Round of multilateral trade negotiations has provided a unique opportunity for the major agricultural exporting countries to rejuvenate agricultural markets through the reform of distortionary national policies.
The first of these chapters summarises the major findings of two recent publications of the Australian Bureau of Agricultural and Resource Economics, both related to trade reform proposals. The two topics covered are the likely impacts of the EEC rebalancing proposal, and tariffication. Tariffication would introduce greater transparency into the policy environment and would allow market forces to provide efficiency gains. While some producers in certain countries would suffer from the implementation of tariffication, these can be overcome through decoupled income support. Rebalancing, however, appears to be a less efficient approach to economic reform. The EEC, as well as countries of the Cairns Group, would experience greater welfare gains from alternative reform approaches.

An important reason for governments to intervene in agriculture is to reduce the impact of unstable world prices on domestic farmers. Yet tariffication would lead to an increase in domestic price variability although global liberalisation would reduce to some extent the variability in world prices. In Chapter 2, the transmission of price variability under tariffication is examined. Alternative tariff-reduction formulae are considered that would allow world price variability to be gradually introduced into domestic economies at the same time as the present gaps between world and domestic prices are phased out.

In Chapter 3, the economic impacts on agricultural production and trade of changes to the Western Grain Transportation Act (formerly known as the Crow Rate) are assessed. The WGTA is one of the oldest and most controversial elements of agricultural policy in Canada and has come under increased pressure for reform during the Uruguay Round. Several scenarios are developed to test the various reform proposals presently being considered for the WGTA. The general conclusion of this paper is that the international trade impacts of the WGTA are minimal. The authors also point out that in many respects the WGTA is close to a decoupled type of programme.

Historically, one of the pillars of Japanese agricultural policy has been the ensurance of self-sufficiency for the major foodstuffs. Chapter 4 argues that the total expenditure on food and drinks in Japan has recently increased sharply, while the share of agricultural production in GDP has declined rapidly over the same period of time. It is noted that there has also been a recent shift in agricultural policy away from the self-sufficiency objective. For example almost 27 percent of the total acreage under rice
was left idle in 1988. The author argues that Japanese consumers are becoming more cosmopolitan in their tastes and that there is a fast-growing market for imported food in Japan.

Part II of the book contains six chapters that analyse liberalisation issues in developing countries in general, and experiences in the Peoples Republic of China, Chinese Taipei, Indonesia and the Philippines in particular.

The first of these chapters develops a conceptual model to demonstrate that it is plausible that developing countries as a group stand to benefit from OECD countries liberalising their agricultural production and trade. The author also points out that even net importers of food could gain when risk and reductions in food price instability in OECD countries are taken into account. Although the exact magnitude of such gains remain an empirical question, the very existence of potential gains should act as an incentive for developing countries to lend their support to freer agricultural trade initiatives in the GATT Uruguay Round.

The impacts of exchange rate and trade policies on the Chinese agricultural sector are analysed in Chapter 6. The trade protectionist measures currently used by the Chinese government include a complex system of a discriminatory exchange rate policy together with tariff measures. Using a general equilibrium model of the Chinese economy, the authors conclude the impacts on agriculture and trade from the discriminatory exchange rate policy far exceed the combined effects of all other forms of protection.

The Taiwanese poultry sector is the object of Chapter 7, on which the impacts of trade liberalisation are estimated. An econometric model of the poultry sector is used to simulate changes in domestic price levels as a result of higher levels of chicken imports following trade liberalisation. The results show that trade liberalisation would lead to higher levels of chicken imports but would also result in lower demand for imported feed grain. It is concluded that the foreign exchange saved from lower feed grain imports would more than offset the chicken import bill. In this respect the author points out that the United States could be shortsighted in pressuring Taiwan to liberalise its poultry sector since the bulk of feed grains is imported from that country.

Chapter 8 reviews policy changes that have taken place in the Indonesian agricultural sector and makes proposals for further reform. The authors argue that Indonesia has comparative advantage in numerous commodities
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and that reform measures should ensure that regional issues are adequately dealt with. The authors propose that regional diversification and commodity zoning be considered along with a reorientation of export policies and programmes.

The Philippines government implemented a comprehensive trade liberalisation programme in 1981, with an objective of correcting distortions due to past tariff and non-tariff policies. Chapter 9 provides an evaluation of progress so far, presents an update of the tariff rate structure adopted by this country and discusses some implications of the current reforms for trade among ASEAN partners. It concludes that the Philippines programme of tariff rate reductions will continue to complement effects of the ASEAN Preferential Trading Arrangement in increasing trade flows between these countries and a more efficient use of regional resources.

The importance of the gradual implementation of trade liberalisation policies in Taiwan is discussed in the final chapter of this part of the book. The authors point out that Taiwan is committed to free markets, but that strategies should be developed in order to make the transition to a deregulated agricultural sector smooth. A proposal is that decoupled assistance to farmers could be useful to cushion the impacts of liberalisation.

Part III of the book focusses on decoupled reform proposals. It is clear that the thrust of the reform proposals put forward during the Uruguay Round is concerned only with policies that distort trade, and that only policies that have this effect should be recognised by any aggregate measure of support. Thus governments who wishes to continue to support their farmers, or to cushion the impacts of liberalisation, could do so as long as adopted measures had little if any influence on the level of national production. The two concluding chapters discuss decoupled policy options, and one country's experience with a decoupled system of farm supports.

Chapter 11 focusses on some difficulties in gaining acceptance of decoupled policies. Such acceptance is likely to require that the policies be politically acceptable, financially manageable and administratively feasible. The transparency of direct payments makes them politically unpopular with farmers, direct payments require government expenditures rather than 'concealed' payments obtained through higher retail prices, and implementation of direct support payments to farmers might require the costly monitoring of individual farms. The chapter examines three
alternative direct payment programmes. It was found that all would be less attractive than border measures to some countries since they involve higher budgetary costs. However, the latter can be significantly reduced if limited to a 'small' production base as in, for example, the producer entitlement guarantee scheme that has been discussed in earlier proceedings of the Task Force.

The book's final chapter makes the point that while most OECD countries are still contemplating the ways and means of reforming agriculture, New Zealand has almost completed a unilateral liberalisation of its agricultural sector. This paper outlines New Zealand's experience at implementing major reforms and argues that a fully decoupled agricultural sector is possible and that farmers can survive the withdrawal of coupled support to the benefit of the wider economy.

Allan N. Rae (Task Force Coordinator)
Doren D. Chadee
PART I

Proposals for
Trade Liberalisation
INTRODUCTION

The Uruguay Round of Multilateral trade negotiations has provided a unique opportunity for the major agricultural exporting countries to rejuvenate agricultural markets through the reform of distorting trade and domestic policies. However, agricultural reform faces many obstacles. First, producers in the high income countries are well organised and are able to muster considerable political and popular support for existing interventionist policies. Second, the negotiation process itself is hampered by several technical problems such as how best to measure support across countries, how to estimate the tariff equivalents of non-tariff barriers and how to provide income support to farmers without creating distortions. Third, while some key participants in the Uruguay Round are seeking reform, the European Community has submitted a proposal which, in part, runs counter to this philosophy in that it would involve an increase in protection for some commodities. In particular, the Community's proposal envisages an increase in tariffs on oilseeds and non-grain feeds in return for reduced protection for EC grains. This proposal is commonly known as the 'rebalancing' proposal.

The European Community has also attempted to link its 'rebalancing' proposal to the US 'tariffication' proposal which seeks replacement of non-tariff barriers with tariffs and the subsequent reduction of those tariffs. The Community has indicated that it would accept a 'modified' form of tariffication provided other countries accepted its rebalancing proposal.

ABARE has prepared two discussion papers which examine some of these issues. In the first (Andrews, Bowen, Gunasekera, Haszler and Field 1990) the likely impacts of the EC rebalancing proposal are analysed in detail.
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In the second (Riethmuller, Roberts, O'Mara, Tie, Tulpule, Hossain and Klijn 1990) a number of the technical issues involved with tariffication are addressed.

The major findings of these two ABARE studies are highlighted in this paper. For the sake of brevity they are referred to as the rebalancing and the tariffication papers.

'TARIFFICATION'

One of the key principles of the GATT is that any protection given to an industry should be by means of tariff rather than non-tariff barriers. The US proposal on tariffication recognises this key GATT principle. The proposal envisages that the wide range of measures that countries now use to restrict import competition would be replaced by tariffs, the level of which would be gradually reduced over time. According to this proposal, in some cases there will be a transition phase before the complete replacement of non-tariff with tariff barriers. This transition phase would involve the use of tariff quotas to partially open domestic markets.

To facilitate and monitor the process of support reduction, an aggregate measure of support is required. Two separate approaches to the definition of an aggregate measure of support have been proposed in the current round of trade negotiations. These include the producer subsidy equivalent and the European Community's support measurement unit. The former is already being used by the OECD, while the latter has yet to be specified exactly. Both measures have their weaknesses as they measure 'support' in different ways. The producer subsidy equivalent incorporates movements in international prices, whereas the support measurement unit would employ a fixed price.

Any possible practical approaches to negotiating and implementing reductions in support need to address two basic issues. First, how to ensure that aggregate trade distorting support is reduced and, second, how to ensure that such reductions in support cannot be circumvented using other means. The ABARE study on tariffication provides several practical examples of reducing support under the US proposal. In these examples, it is assumed that support would be reduced by 40 per cent over a five year period. The support measures included were tariffs, tariff equivalents of non-tariff barriers, internal subsidies subject to GATT disciplines and
export subsidies.

Two alternative reform paths were considered for reducing border support. The first was ‘pure tariffication’, under which countries would replace existing non-tariff barriers with their specific tariff equivalents. These tariffs would then be reduced over time. The second approach involved the use of tariff quotas, which would be expanded annually over a transition period, thus gradually increasing access to protected markets.

However, it is important that the level of base support, from which reductions in assistance are to be negotiated, is set at an appropriate level. For example, if commitments to reduce assistance are based on excessively high base support levels, then countries may not need to reduce actual support in order to meet those commitments. A way around this problem would be to reduce administered prices rather than support levels. In that way commitments to reduce protection would be expressed in terms of policy instruments rather than possibly unrepresentative and variable measures of assistance.

In the examples, the base support level from which assistance is reduced is the average of the five year period between 1984 and 1988, excluding the highest and lowest years. The examples provided in the tariffication paper include reducing support for Japanese rice, US sugar and wheat and EC wheat.

Under pure tariffication, if a 40 per cent reduction of support were to apply to Japanese rice over five years, with the first cut to be applied in 1991, the specific tariff would fall from Y237 000/t in 1990 to Y142 000/t in 1995 (with the intervening levels being Y218 000/t in 1991, Y199 000/t in 1992, Y180 000/t in 1993 and Y161 000/t in 1994). On the other hand, negotiators could agree to a transition period in which Japan adopted tariff quotas and ensured staged reductions in imports. The eventual tariff to apply after the transition period would again be Y142 000/t. By the end of the adjustment period, the tariff quota would need to be some 3 Mt. To reach that level over a five year adjustment period, imports under the tariff quota could rise by an estimated 600 kt a year.

The fall in prices to Japanese producers in response to a 40 per cent reduction in support over the five year period is estimated to be of the order of 34 per cent. The resultant increase in the world rice price was estimated to be 8 per cent. However, the effect of the price fall on farmers'
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incomes, on average, would be relatively modest. This is because over 80 per cent of Japanese farm family incomes are now derived from non-farm activities (ABARE 1988).

Under pure tariffication, the specific tariff for US sugar would have to fall from US$186t in 1990 to US$112t in 1995 in order to achieve a 40 per cent reduction in support at the end of the five year adjustment period. (The negotiated reductions in tariff equivalents over the intervening period in this example would be US$171/t in 1991, US$156/t in 1992, US$141/t in 1993 and US$126/t in 1994). Tariff quotas could also be negotiated to ensure a staged increase in access to the US sugar market. In order to obtain a 40 per cent reduction in sugar support, the tariff quota would need to be set at 3.2 Mt by the end of the transition period.

The phased reductions in total US support for wheat over the five year transition period are from US$63/t in 1990, to US$58/t in 1991, US$53/t in 1992, US$48/t in 1993, US$43/t in 1994 and finally, to US$38/t in 1995. However, if during this five year transition phase world wheat prices were higher than those applying during the base period, actual support levels would be likely to be lower than the negotiated levels. In that case, an alternative approach could involve reductions in the target (or administered) price over the transition period. To achieve a 40 per cent reduction in the base level of support over the five year transition period would involve a cut in the target price for wheat of about US$3/t a year.

Support is provided to EC wheat producers by a combination of border measures and government intervention, which results in internal prices to producers and consumers being maintained around administratively set target prices (Figure 1). Under pure tariffication, to achieve a 40 per cent reduction in support for EC wheat at the end of the five year adjustment period the specific tariffs would need to be adjusted down from 72ECU/t in 1990 to 43ECU/t by 1995 (with the intervening levels being 66ECU/t in 1991, 61ECU/t in 1992, 55ECU/t in 1993 and 49ECU/t in 1994).

As the assumed base period in the example includes the extremely low world price and high support levels of 1985, 1986 and 1987, the European Community would have a high base level of protection to negotiate down. Therefore, unless very large reductions in support were negotiated, the exercise may do little more than restore support to levels that had previously applied.
There is an alternative approach to tariffication for EC wheat that could help overcome the associated risk of using an unrepresentatively high base support level. This would involve negotiated cuts to those administered prices that determine the actual level of assistance to producers in the Community. The prices affected would be the target price, the intervention price and the threshold price.

In all these examples discussed, reductions in support are likely to lead to a fall in farm land values and profits in the affected agricultural industries. Compensation for this could possibly be provided by a form of direct income (or decoupled) support or, alternatively, from a modified form of producer entitlement guarantee scheme.

A crucial element in any successful implementation of tariffication is the need to prevent countries replacing the resultant reduced support with other forms of assistance. Therefore, unless all countries participating in the Uruguay Round have a firm commitment to broadly based reform of all policies that distort agricultural trade, there is a distinct danger that any reforms achieved under tariffication could be undermined.

**EC 'REBALANCING’**

In ABARE’s rebalancing paper, the implications of the EC proposal to reduce its protection on grains in exchange for increases in border protection for oilseeds and non-grain feeds were analysed using a world agricultural trade model. Two alternative types of reform, which reflect a ‘tops down’ approach to reducing protection, were also analysed in the paper. In the first, the EC import duties on oilseeds and manioc were maintained at current levels and the protection levels on grains reduced. In the second, import duties on oilseeds and manioc were again unchanged and support levels on highly protected EC agricultural products reduced.

The results of this analysis show that, with EC rebalancing, world prices for wheat and corn would increase (Figure 2). This is due to reduced EC wheat exports and increased corn imports. The EC proposal could thus offer other wheat exporting countries the prospect of an increased share of world wheat trade. Increased EC corn imports would be important to the United States, as it is currently the major corn exporter to the Community. On the other hand, the results also show that EC rebalancing would reduce the world prices of oilseeds and meals. This is because of
Proposed Strategies for International Trade Reform

reduced EC imports of these products. The world price of manioc would remain unchanged because the Community would continue to import manioc at the level set by the voluntary export restraint. Changes in the world prices for grains in the first alternative reform analysed in ABARE's rebalancing paper would be similar to those which occur with EC rebalancing (Figure 3). In contrast, changes in world oilseed prices would be very small.

In the second alternative reform, where support levels for highly protected EC farm products were lowered, world prices for most of these products would increase (Figure 4). The largest increases in world prices would be for products that are highly protected in the European Community. These include butter, sugar and sheep meat.

The welfare results of the ABARE rebalancing paper suggest that the EC proposal would generate large net welfare gains to the Community, as shown in Table 1. This is because of reduced expenditure on grain export subsidies and increased revenue from tariffs on corn, oilseeds and manioc. EC rebalancing would not, however, necessarily be beneficial to other countries. Although US producers would benefit from higher world meat prices and increased EC corn imports, those gains would be partly offset by reduced world oilseed prices. On balance, it appears that this type of change might not have a significant net effect on the economic welfare of US producers - some agricultural industries would benefit while others would lose.

According to the welfare results, net economic gains for the developing country members of the Cairns Group would decline as a result of EC rebalancing (Table 1). This is because, as a group, these countries are net importers of wheat and net exporters of oilseeds. However, it is important to recognise that wheat and corn producers in these countries would gain from the increase in world prices of these products. In contrast to some of the developing country members of the Cairns Group, Australia, as a wheat exporter, would benefit from EC rebalancing. This is because of improved world wheat prices.

Although economic welfare would be likely to improve in the Community as a result of rebalancing, greater welfare gains could accrue to the Community under an alternative approach to reducing disparities in protection. Reducing protection for the most highly protected EC farm products, while leaving import duties on oilseeds and manioc unchanged, offers the prospect of even larger welfare gains for the Community. Such
an approach would also generate large gains to the United States, developing country members of the Cairns Group and Australia.

If these alternative approaches were extended by further reducing EC levels of protection for a wide range of farm products, welfare gains to the Community and its trading partners would likely be even larger again. Such an approach would also be consistent with the proposals submitted by the United States and the Cairns Group to the Uruguay Round.

**CONCLUDING REMARKS**

If implemented, tariffication would introduce greater transparency into the policy environment and allow international market forces to play a greater role in the allocation of resources in agriculture. This, in turn, has the potential to lead to greater efficiency in agricultural sectors.

The examples of the practical application of tariffication indicate that a phased reduction in support would have beneficial effects on world markets. At the same time, however, some agricultural industries in the countries which adopt reforms would be adversely affected. For example, in both Japan and the United States the major adverse effect appears to be the likelihood of a decline in land values. This, in turn, would be likely to exert pressure on governments to provide compensation to the affected producers. In the event that such compensation were in fact provided, it is clear that this should be done through measures which give direct income support to producers while have a minimal effect on market prices.

Examination of the actual process by which tariffication and the reduction of external and internal support measures could be implemented reveals the importance of several practical issues. These include the adequacy of information on the extent and effects of non-tariff barriers and of internal support measures; the base period from which negotiated reductions in protection would commence; and uncertainty as to whether various internal support measures are decoupled.

For both the PECC countries and the European Community, rebalancing does not appear to be the 'first best' approach to economic reform. Resource allocation and net welfare in the European Community could be improved further by alternative ways of reducing disparities in support. In particular, the welfare gains accruing to the European Community could be increased
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further by a 'tops down' approach - by reducing protection for highly assisted feedstuffs while leaving import duties on oilseeds and non-grain feeds at current levels. Even larger gains to the European Community would accrue from a general reduction in assistance to highly protected agricultural industries while leaving import duties on oilseeds and non-grain feeds at current levels. Higher welfare gains were indicated from both these alternative policy changes for the European Community, the United States and Australia compared to rebalancing. For the developing Cairns Group of countries a general reduction in EC protection would result in an increase in net economic welfare.

Another finding that emerges from ABARE's rebalancing paper was the small size of the overall gains to the United States from the 'tops down' approaches to reducing EC farm support. This finding may, at first, raise questions about the United States pursuit of agricultural trade reform, particularly its insistence on reform in EC agriculture. However, the welfare gains need to be viewed in the context of the small number of commodities for which protection is reduced and the limited extent of policy changes undertaken in the ABARE paper. It is also important to recognise that while the overall economic gains for the United States are small relative to the size of the US economy, they are of some significance relative to the size of its agricultural sector, and particularly the grains industry. Also, it is significant that the United States has wider objectives in the Uruguay Round - in particular to secure agreements in trade in services and intellectual property rights. Some observers have argued that the United States sees agricultural trade liberalisation at a multilateral level as a prerequisite for agreement on these other issues.

Tariffication and rebalancing constitute two significant elements in the Uruguay Round negotiations with different but not necessarily mutually exclusive objectives. Tariffication provides a means of improving market access, the achievement of which would benefit considerably the multilateral world trading system generally and agricultural markets in particular. While the introduction of tariffication would certainly require modifications to domestic policies, its major impact would be essentially international in nature. Rebalancing on the other hand essentially represents a change to the domestic policy of the European Community which nevertheless has international implications.
REFERENCES


Proposed Strategies for International Trade Reform

Figure 1: Support regime for grain in the EC

- Target price
- Threshold price
- EC market price
- Intervention price

Import levy

Export restitutions (subsidy)

Import price

Export price

Figure 2: Percentage change in world prices under the EC proposal

- Other meals
- Other oilseeds
- Soybean meal
- Soybeans
- Other coarse grains
- Corn
- Wheat
Figure 3: **Percentage change in world prices under alternative 1**

- Other meals
- Other oilseeds
- Soybean meal
- Soybeans
- Other coarse grains
- Corn
- Wheat

Figure 4: **Percentage change in world prices under alternative 2**

- Butter
- Milk powders
- Cheese
- Sheep meat
- Pork
- Sugar
- Other coarse grains
- Corn
- Wheat
**Table 1. Summary of changes in total welfare under EC rebalancing**

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(a) Alternative 1 - import duties on oilseeds and manioc maintained at current levels; protection levels on grains reduced.

(b) Alternative 2 - support duties on oilseeds and manioc maintained at current levels; support levels on highly protected EC agricultural products reduced.
INTRODUCTION

Recent proposals to the General Agreement on Tariffs and Trade (GATT) have called for the conversion of all nontariff trade barriers into their tariff equivalents and for the subsequent reduction of these tariff equivalents over time. The purposes of tariffication are to provide a methodology to quantify nontariff trade barriers, thereby making them more visible, and to provide a framework within which to reduce them. Many nontariff trade barriers are designed to stabilise domestic prices by breaking the link to world prices and, thus, the link with the variability of world prices.

Tariffication has the side effect of replacing domestic price-stabilising policies with a policy that dramatically increases domestic price variability. For example, if a country replaced its nontariff barriers with a 100 per cent tariff and world prices then increased from $2 to $4, the domestic price would increase from $4 to $8. This example illustrates that ad valorem import tariffs magnify world price variability, which will affect the political acceptability of tariffication proposals.

This paper examines the transmission of price variability under tariffication. Alternative tariff-reduction formulas are considered, including a proposed modification of an existing formula that is developed to slowly introduce world price variability into domestic markets while reducing the price wedge over time. A two-country, one-commodity model, which includes random error terms in the supply and demand equations, demonstrates the effects of tariffication and the reduction of the tariff equivalent using existing formulas and the proposed reduction formula.

First, the advantages and disadvantages of existing tariff-reduction formulas are considered and an alternative formula is presented.
Reducing Domestic Price Variability

are presented. One of the existing formulas is then modified to slow the transmission of price variability from world to domestic markets. Next, the results of simulating tariffication and reduction of the tariff equivalent using the two-country, one-commodity model are presented. Finally, a summary of the important results is presented.

TARIFF EQUIVALENT REDUCTION FORMULAS

Several alternative adjustment formulas for the tariff are available. Perhaps the most intuitive and reasonable from a modelling viewpoint is to reduce the tariff by $1X$ of the initial tariff level in each year, where $X$ is the number of years over which the tariff is to fall to zero. Unfortunately, this concept may not appeal to trade negotiators because the measured tariff levels in each year would depend on domestic policies and world price levels. Countries are not likely to agree to a tariff adjustment system that makes domestic agricultural policy a function of potentially volatile world prices. Indeed, the motivation for the protectionist policies of many countries is to insulate domestic markets from the frequent wild swings in world prices. Hence, those countries will be reluctant to accept a proposal that would immediately transfer this volatility to domestic prices and markets, at least until the impact of liberalisation has stabilised world prices. The agreed-upon adjustment path, therefore, needs to allow for annual changes in world price levels.

A second alternative is the Swiss formula considered in the Tokyo Round of the GATT negotiations (Tangermann, Josling and Pearson, 1987). This formula can be written as

$$T_t = \frac{A T_{t-1}}{A + T_{t-1}}$$

(1)

where $T_t$ is the tariff level that must be achieved in a given year, $T_{t-1}$ is the tariff level in the previous year, and $A$ is the negotiated coefficient of adjustment.

The formula allows for a lagged response to changes in world price levels. The tariff adjustment is not instantaneous, however. Tariffs in this formula are determined in advance; consequently, large changes in world prices will have an impact on domestic prices. The tariff will adjust to these world price changes, but the adjustment occurs a full year after the changes in
world prices. In addition, the nature of the formula guarantees that, for all probable levels of the negotiated coefficient, the brunt of the adjustment will be borne in the early years of the agreement. The rapid adjustment of tariffs with this formula may be more suited to the industrial trade barriers considered in the Tokyo Round of the GATT negotiations than to agriculture. Adjustment costs in agriculture would be relatively high. At the same time, the level of protectionism in agriculture is greater now than was the case during the Tokyo Round. Also, the Swiss formula does not allow for a reduction of a given tariff to zero over a given number of years. Unless the value of the adjustment coefficient is zero, the value of the tariff will never reach zero.

The following proposed modification of the Swiss formula addressed the problems inherent in the first two alternatives.

\[
T^a_t = \frac{\left(\frac{r}{n}\right) A T^a_{t-1}}{\left(\frac{r}{n}\right) A + T^a_{t-1}}
\]

(2)

\[
T^a_{t-1} = \frac{(P_{d,t-1} - P_{w,t})}{P_{w,t}}
\]

(3)

where \(T^a_{t-1}\) is the ex-ante tariff, \(n\) is the negotiated length of the adjustment period, \(r\) is the number of years remaining in the agreement, \(P_d\) is the domestic price, and \(P_w\) is the world price. This formula allows for a wide range of adjustment paths. The advantages of the proposed formula are that a target date by which zero trade barriers must be achieved can be stipulated and that the formula automatically adjusts the tariff to allow for world price movements.

In addition, under the proposed formula, the tariff adjusts instantaneously to compensate for changes in world prices, which serves to isolate the domestic market from changes in world prices without transmitting
Reducing Domestic Price Variability

domestic price variability to the world market.

A second alternative is to replace $P_{d,t-1}$ with $P_{ct}$ in (3). This substitution is feasible but would allow the tariff to adjust for domestic disturbances and would allow the importing country to export domestic price variance to the world market. This version of the formula would be unacceptable to exporting countries.

The practical implications of these alternatives can best be understood with a simplistic example. Consider an importing country that uses a variable export levy to maintain domestic price stability. Should this country shift to an ad valorem tariff, disturbances in world markets would be transmitted to domestic markets. The modified Swiss formula shown in (2) and (3) would at first isolate the effects of domestic and world disturbances; i.e. the prices in the importing country would reflect disturbances in that country, whereas prices in world markets would reflect disturbances in world markets. As world and domestic prices moved together, then so too would the variance of world and domestic prices. In the last year of the agreement, the two disturbances would be identical. (Presumably world price variance would be lower after trade barriers have been removed).

AN EMPIRICAL EXAMPLE

To demonstrate the claims made in this paper, we have constructed a simple empirical model. For realism, we have used actual prices and elasticities; however, the model is too simplistic to provide real-world predictions. These results are presented only to demonstrate the concepts that underlie the formulas just discussed. Any attempt to introduce more realism (such as introducing other countries and commodities) would unduly complicate the model and disguise the more relevant results.

This model contains two countries (the United States and the EC). The United States begins as a net importer and the EC as a net exporter. However, these situations are reversed as markets are liberalised. We assume in the base case that the EC replaces its variable import levy when this occurs. Table 1 presents the base year data and assumed elasticities.

The supply and demand specifications for each country take the general form:
where $Q_{Si}$ is the quantity supplied in country $i$, $QDi$ is the quantity demanded in country $i$, $ES1$ is the excess supply in country 1, $ED2$ is the excess demand in country 2, $Pi$ is the price in country $i$, $f_{1i}$ is a supply shifter in country $i$, $ai$ is a demand shifter in country $i$, and $r_{i}$ and $V_{i}$ are randomly distributed mean zero error terms with variance $e_{i}$ and $w_{i}$, respectively.

The world market is represented by

$$ES_{1} = ED_{2}, \quad \text{(8)}$$

$$P_{2} = E*Z_{1}P_{1} + Z_{2}, \quad \text{(9)}$$

$$Z_{1} = E(1-s_{1})(1-s_{2})(1 + t_{1})(1 + t_{2}), \quad \text{and} \quad \text{(10)}$$

$$Z_{2} = E(T_{1} - S_{1} + C) + T_{2} + S_{2}, \quad \text{(11)}$$

where $E$ is the exchange rate, $s_{1}$ is an ad valorem export subsidy, $S_{1}$ is a specific export subsidy, $s_{2}$ is an ad valorem import subsidy, $S_{2}$ is a specific import subsidy, $t_{1}$ is an ad valorem export tariff, $T_{1}$ is a specific export tariff, $t_{2}$ is an ad valorem import tariff, $T_{2}$ is a specific import tariff, and $C$ is the transportation cost between country 1 and country 2.

Several alternative policies can be represented by (10) and (11). For example, to examine the effects of changes in the import tariff on the importer's price, (10) reduces to $E*(1+t_{2})P_{1}$, and (8) reduces to $E*C$. 

\[Q_{Si} = f_{i}(P_{i}a_{i}), \quad i = 1,2\] \[QDi = g_{i}(P_{i}a_{i}v_{i}),\] \[ES_{1} = QS_{1} - QD_{1}, \quad \text{and}\] \[ED_{2} = QD_{2} - QS_{2},\]
Reducing Domestic Price Variability

Under a variable levy, the link between the importer's price and world prices, equation (10), is replaced by a constant import price $P_2$. The effect is to prevent the transmission of the variability of world prices into the importer's markets.

To analyse the transmission of variability under various trade policies, the model was simulated for 100 iterations by using the programme @RISK. The programme solves for the equilibrium prices and quantities for a given set of disturbance terms. A new set of disturbance terms is then generated and new equilibrium values are found. This process is then repeated 100 times to generate a price distribution for each policy and/or year. The parameters of the resulting price distributions can then be used as proxies for those of the true distributions.

The policies include no trade, free trade, *ad valorem* import and export subsidies and tariffs and a variable levy. The resulting means and variances of the endogenous variables are presented in Table 2.

In the no-trade scenario, the EC price is much higher than is the US price. Under free trade, the prices differ only by the transportation costs, and the variances are similar. Under an import or export subsidy, US prices rise and EC prices fall relative to the free trade levels, and the variance of EC prices falls. Under an export or import tariff, US prices fall and EC prices rise relative to free-trade levels, and the variability of EC prices increases by a factor of 10. Under a variable levy, the US prices fall and variability increases relative to free trade, whereas the EC prices are much higher than the free-trade results. The variability of the EC prices under the variable levy is zero because the prices are set exogenously. The implication for tariffication is that US prices will increase and their variability will decrease while EC prices decrease as their variability increases. The extent of the increase in variability of EC prices will depend on the formula chosen to decrease the tariff equivalent over time.

**TARIFFICATION OF THE EC VARIABLE LEVY**

The tariff equivalent of the variable levy can be found in this two-country, one-commodity model by driving a wedge between the prices until prices and quantities under the tariff are exactly equivalent to those under the variable levy. The calculated tariff equivalent of the variable levy is 0.64. The tariff equivalent is then reduced over time using the modified Swiss
and the Swiss formulas.¹

The results of simulating the reduction of the tariff equivalent over 10 years are presented in Figures 1a through 3b. The modified Swiss formula is used in Figures 1a through 3a and the Swiss formula is used in Figures 1b through 3b. The results presented are for year 1 (Figures 1a and 1b), year 5 (Figures 2a and 2b), and year 10 (Figures 3a and 3b).

As shown in Figures 1a and 1b, the variability of the EC prices is less in year 1 under the modified Swiss formula because the modified Swiss formula adjusts the tariff as the world price changes, and therefore the variability of world price is not transmitted into the domestic market. The variability of domestic prices is attributed to only domestic disturbances and not to variability in world markets.

Tariffication of a variable levy results in domestic producers being subjected to price variability where previously none existed. This would be the case for tariffication of all nontariff trade barriers that are designed to set price levels. Other nontariff trade barriers that allow some degree of domestic price variability, such as quotas, would have a modest increase in domestic price variability under tariffication using the modified Swiss formula but a much larger increase when the Swiss formula is used.

In the fifth year of the reduction, the means of the distributions for the exporter and the importer move closer as the tariff is reduced (Figures 2a and 2b). However, the variance of prices under the modified Swiss formula continues to decrease whereas the Swiss formula maintains a larger variance.

By the last year of the reduction, the distributions of price under the modified Swiss formula are separated only by transportation costs, whereas the price distributions under the Swiss formula remain widely separated because the Swiss formula does not force the tariff equivalent to reach zero by the end of the agreement (Figures 3a and 3b).

¹ A small-country assumption was necessary because the degree of simultaneity in the large-country version caused convergence problems.
SUMMARY AND CONCLUSIONS

The tariffication proposals to the GATT promise to provide a framework for the reduction of barriers to trade. However, a drawback of such proposals is that *ad valorem* tariffs cause domestic price variance to be greater than world price variability. Given that many trade barriers were implemented to reduce price variability, a policy that dramatically increases price variability would likely be politically unacceptable.

A proposed tariff-reduction formula that gradually transmits world price variability to domestic markets is presented. Simulation results using a two-country, one-commodity trade model support the claims made for the new formula.
REFERENCES


### Table 1. Base year data and assumed elasticities\(^a\)

<table>
<thead>
<tr>
<th>Elasticities</th>
<th>United States (Country 1)</th>
<th>European Community (Country 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
<td>0.65</td>
<td>0.55</td>
</tr>
<tr>
<td>Demand</td>
<td>-0.70</td>
<td>-0.70</td>
</tr>
<tr>
<td><strong>1986 Data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supply</td>
<td>11.292</td>
<td>7.445</td>
</tr>
<tr>
<td>Demand</td>
<td>12.031</td>
<td>6.991</td>
</tr>
<tr>
<td>Net Imports</td>
<td>0.739</td>
<td>-0.454</td>
</tr>
<tr>
<td>Price</td>
<td>1.878</td>
<td>3.221</td>
</tr>
<tr>
<td><strong>Coefficients</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fi1</td>
<td>3.952</td>
<td>3.350</td>
</tr>
<tr>
<td>fi2</td>
<td>3.908</td>
<td>1.271</td>
</tr>
<tr>
<td>ri</td>
<td>1.271b</td>
<td>0.596b</td>
</tr>
<tr>
<td>gi1</td>
<td>20.453</td>
<td>11.885</td>
</tr>
<tr>
<td>gi2</td>
<td>-4.484</td>
<td>-1.519</td>
</tr>
<tr>
<td>vi</td>
<td>0.352c</td>
<td>0.444c</td>
</tr>
</tbody>
</table>

\(^a\) The base year is 1986. The data and elasticities are taken from Roningen and Dixit.

\(^b\) Variance of the random term in the supply equation in country i.

\(^c\) Variance of the random term in the demand equation in country i.
Table 2. Mean prices and variances under various trade policies

<table>
<thead>
<tr>
<th>Protection level (%)</th>
<th>US Price</th>
<th>EC Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ($/kg)</td>
<td>Variance (ECU/kg)</td>
</tr>
<tr>
<td>No trade</td>
<td>NA</td>
<td>1.97</td>
</tr>
<tr>
<td>Free trade</td>
<td>0.00</td>
<td>2.18</td>
</tr>
<tr>
<td>US export subsidy</td>
<td>0.50</td>
<td>2.50</td>
</tr>
<tr>
<td>US export tariff</td>
<td>0.50</td>
<td>1.93</td>
</tr>
<tr>
<td>EC import subsidy</td>
<td>0.50</td>
<td>2.50</td>
</tr>
<tr>
<td>EC import tariff</td>
<td>0.50</td>
<td>1.93</td>
</tr>
<tr>
<td>EC variable export restitution</td>
<td>0.75</td>
<td>1.87</td>
</tr>
</tbody>
</table>
Reducing Domestic Price Variability

Figure 1a: Exporter and importer price distributions for year 1 of tariff reduction using modified Swiss formula

Figure 1b: Exporter and importer price distributions for year 1 of tariff reduction using Swiss formula
Figure 2a: Exporter and importer price distributions for year 5 of tariff reduction using modified Swiss formula

Figure 2b: Exporter and importer price distributions for year 5 of tariff reduction using Swiss formula
Reducing Domestic Price Variability

Figure 3a: Exporter and importer price distributions for year 10 of tariff reduction using modified Swiss formula

Figure 3b: Exporter and importer price distributions for year 10 of tariff reduction using Swiss formula
CHAPTER 3

TRANSFORMING GRAIN TRANSPORTATION POLICIES IN CANADA: IMPACT ANALYSIS

H. Bruce Huff, Kurt K. Klein, Jeff Corman*

INTRODUCTION

Transportation policies have long been an integral part of agriculture policy in Canada. The Western Grains Transportation Act (WGTA) which compensates the railways for the movement of grain from the prairies to export points is currently the largest single government statutory programme expenditure for the agriculture sector. Hence, significant agriculture policy reforms must involve some consideration of this transportation policy.

The objective of this paper is to examine some of the proposed options for modifying this programme and the impact of adjustments, particularly with respect to its international implications. These options include a complete phase-out of the subsidy, a change in the method of payment which limits any production incentive, and a change in the method of payment to reduce the production distortions among commodities.

For the implementation of these options, it must be recognised that the 1980's were a particularly difficult time for the Canadian prairie economy. Land prices declined significantly in response to a cost-price squeeze and lower production from a series of droughts. This economic hardship is continuing as interest rates have reached record levels in real terms, the Canadian dollar has appreciated against the US dollar, export subsidies by the US and the EEC are rising and payments under the Canadian grain stabilisation programmes which are based on moving average prices have ended. In addition, the international environment presents a number of unknowns. These include revisions to the US Farm Bill with provision for expanded export subsidies, the potential for free imports of US grain under the terms of the Canada-US trade agreement and a possible GATT agreement resulting in new trading rules and limits on domestic policies. At the same time, the Canadian government is faced with a large and persistent budget deficit which may restrict the level of transfers to the grain sector of the magnitude seen during the past few years.

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Canada is in the process of a comprehensive review of all agriculture policies. In November, 1989, the Minister of Agriculture released a discussion paper *Growing Together*. This paper describes the four basic pillars of a new policy framework — more market responsiveness, greater self-reliance, recognition of regional diversity, and increased environmental sustainability. The process has been undertaken with establishment of fourteen Task Forces composed of federal and provincial government and industry representatives that are currently discussing options to propose to federal and provincial ministers of agriculture. The WGTA is one of the principle programmes under review by the Transportation Task Force. It must respond to the criticism of the programme that it involves large budgetary costs, production and trade distortions, inequities among commodities and regions, constraints on diversification, and inefficiencies in the transportation and handling system.

Canada, as a member of the Cairns group is a proponent of comprehensive, integrated and equitable policy reforms for the agriculture sector under the current GATT round of negotiations with respect to import access barriers, internal support measures, export subsidies, and health and sanitary standards. An objective on which Canada places high importance in the GATT negotiations is to not only limit the level of assistance to agriculture but to restrict assistance programmes to the types that have no trade distorting impact. The WGTA, in terms of international discussions is a critical element of such agricultural policy reform for Canada.

The next section provides a background to the domestic and international trade policy issues outlined above. The following section describes the analytical techniques for evaluating the modifications of the WGTA currently being considered. The further section provides the empirical results using a regional programming model for Canada. The fifth section discusses the implication for domestic and international trade policy, and the paper finishes with a summary and conclusions.

**BACKGROUND**

The majority of Canadian grains and oilseeds are produced in the prairies and exported as primary products. The attached graph indicates the regional importance of this production and the proportion exported. In recent years, the large traditional markets in Europe have tapered off while the growth
markets have been in the Pacific Rim shifting the location of export ports for grains and oilseeds from eastern to western Canada.

The Crow Rate (now the WGTA) refers to the statutory freight rates for moving grain from the prairies for export. It was set originally in 1897 as a guarantee to the Canadian Pacific Railway (CPR) for the construction of railway through the Rocky Mountains (the Crow's Nest pass). It was not until the early 1960’s that the increase in energy costs seriously affected the railways willingness to move grain at these rates. In 1984, the WGTA was introduced which provided compensation directly to the railways for the difference between the producer contributions and the rates based on a negotiated cost formula. Producers were to pay an increasing percentage of the full cost over time. The total federal government cost is $720 million in 1989/90, which on average represents a subsidy of about $21/tonne.

The WGTA subsidy results in a higher farm level price for grain. In 1986, the province of Alberta introduced a programme to offset the impact of the higher prices for grain fed to livestock arising from the WGTA subsidy. During the past year, the provinces of Saskatchewan and Manitoba have also introduced similar (but more limited) programmes.

There have been a number of studies on the affects of this programme (see summary by Kerr et al). In general, from these studies it is well recognised that the freight subsidy raises the farm level price for grains and oilseeds. This increases the livestock feed price and reduces livestock and meat production and net exports. At the same time grain and oilseed production and exports are higher. The effect is largely restricted to western Canada as the feedgrain market in the eastern part of the country is on a corn import basis which determines their feed costs. As well, the dairy and poultry sector are regulated by supply management policy with output prices set using cost of production formulae. Thus, any impact on the dairy and poultry sectors is through a decrease in domestic consumption arising from the higher grain prices.

There have been a number of changes affecting the trade in Canadian grain. For example, as part of the Canada-US trade agreement, import licences for grains regulated by the Canadian Wheat Board will no longer be required when assistance levels (as defined in the agreement) in the US drop to the level of those in Canada. Import licences for oats were discontinued in 1989. The calculations for 1990 indicate that, largely as a result of the drought, the assistance level for wheat is only marginally
higher in the US.

**ECONOMIC ANALYSIS**

In order to assess the options and to aid the debate of the issues relating to the WGTA identified above, four types of scenarios of program modifications were analysed — (i) status quo or pay the railways, (ii) 10 year phase out of benefits with no compensation, (iii) pay the producers the benefits, and (iv) payout to producers via an annuity for ten years.

The empirical evaluation was conducted using the Canadian Regional Agriculture Model (CRAM).\(^1\) CRAM is a large mathematical programming model representing the major agricultural sectors in Canada. Grains and oilseed production in the prairie provinces is disaggregated at the crop districts level (22) and at a provincial level for the remainder of Canada. Livestock and poultry commodity production is modelled at a provincial level, except for the four Atlantic provinces which are treated as one. For this study, CRAM was calibrated for the 1989 costs, prices, government payments and livestock inventories, but used average grain yields from the 1982-88 period.

The elasticities in the model are assumed to be medium term responses showing the adjustment after about 5 years. The model not only captures the production adjustments among the grains and the livestock commodities, but also examines the gross and net income changes for each commodity, changes in government expenditures, asset value changes, and an approximation of efficiency (using the objective function which represents the producer and consumer surplus).

The issue of equity and the nature of appropriate compensation is a difficult one. The freight subsidy increases the prices not only for that grain which is exported, but all the grain that is produced on the prairies. An increase in the freight rates would not only reduce the price of grain exported, but all grain produced. The so-called 'dilution' effect. Thus there are persuasive arguments for compensation to be based more fairly on all marketings or even production rather than only on exports.

\(^1\) Details of the Canadian Regional Agriculture Model can be obtained from the authors.
It is contended that changing the method of payment is a necessary condition for improving efficiency in the grain transportation and handling system. There would also need to be other regulatory changes in order to achieve these efficiencies. It is estimated that such changes could stimulate an improvement in efficiency by approximately three per cent per year.

The four scenarios noted above are described below in more detail:

(i) *Scenario 1: Status Quo.* This option represents the current situation. Western Canadian grain producers pay a freight rate close to one third of the full compensatory level, and the shortfall is paid by the federal government directly to the railways. There is an offset programme in place in the province of Alberta which compensates feed grain users for the price distortion caused by the subsidised producer freight rates under the WGTA. This is the base policy against which the modifications are compared.

(ii) *Scenario 2: Complete removal of WGTA, no compensation.* The major assumptions in this scenario are that producers freight rate will gradually rise to the full compensatory rates with no provision made for compensation due to the change in policy. The full compensatory freight rate level are reached after a 10 year phase in period. This represents the most extreme modification of the programme.

(iii) *Scenario 3: Partial removal of WGTA, with compensation.* In this scenario, the producers pay 81% of the full compensatory freight rate and the remaining 19% is paid directly to the railways (as a means of ensuring an appropriate level of service). However, 81% of the annual WGTA benefit of $720 million is paid directly to the producer. That payment is on the basis of all marketings, rather than just on eligible shipments (those movements now covered under the WGTA).

(iv) *Scenario 4: Total removal of WGTA, with compensation.* The producer pays the full compensatory freight rate with the Crow benefit eventually ended. The Crow benefit for the next 25 years is discounted into a present value and this amount is distributed directly to producers by the payment of an annuity over a 10 year period. A single producers’s share of the annuity is based on historical production, thereby avoiding distortions of current production decisions.
RESULTS

This section reports on some of the results from the study, focusing on those that have an international interest. Table 1 illustrates the changes in the level of western Canadian production and shipments of the major grains and oilseeds and the herd size and export changes in the beef and pork sector. As a result of the higher freight rates charged under scenarios 2, 3 and 4, production of wheat and coarse grains would decline while the production of oilseeds would increase. This is due to the shift in relative profitability of the various crop enterprises. The major exception to this rule is in scenario 4, where barley/oats production and exports would increase. The reason for this is that since individual producer compensation is based on production, some areas which enjoy a large comparative advantage in producing barley would benefit from producing more of it. The largest decline in cereal production would occur in scenario 2 where no compensation would be paid to producers. Another important factor in the cereal production decline is that more crop land would be summerfallowed (left idle for one crop year).

For scenarios 2, 3 and 4, it is estimated that Canadian cereal exports would decline 1-2 per cent, which directly reflects production changes due to the fact that exports in CRAM are treated as a residual after domestic needs are met. Therefore, since the change in domestic uses of wheat and oilseeds would be minimal for the different scenarios, reduced production would translate into reduced exports.

However, the exports of coarse grains would decline more than production as domestic grain consumption would rise from the expanded livestock herd. The cow/heifer and sow herds are estimated to increase in scenarios 2, 3 and 4, due to the lower domestic price of feed grains. The cow/heifer inventory increase is estimated to be the same in scenarios 2 and 4 because the feed/grain price declined by the same amount whereas in scenario 3 the cow/heifer herd would be somewhat smaller. Also, the relative increase in sow numbers would not be as great as for the beef cow herd because the majority of the pork is produced in Ontario and Quebec where there would be no impacts on feed prices due to the removal of WGTA freight rates. This is because Ontario and Quebec feed grain prices are based on the world corn price.

The export estimates for beef and pork (expressed in meat equivalents) show considerable variability. Once again, in the analysis exports are treated
as a residual after domestic needs are met, and if the domestic needs remain relatively constant across scenarios, the export figures will increase by the total increase in production. Beef exports increase significantly as would be expected since western Canada has always been a net exporter of beef. It is assumed that the export market would absorb the expanded production without affecting the product price.

In Table 2, the estimated net income (defined as gross returns above variable costs) level for all major agricultural commodities are shown for each of the scenarios. The crop sector net income shows an estimated decrease in scenario 2, combining full compensatory rates and no direct producer payments by way of compensation, compared with the base scenario 1. However, the crop sector income is expected to increase for scenarios 3 and 4 compared to the base scenario. This would result from a shift to higher valued crops and from the total value of the direct producer payments.

Beef and particularly pork sector net income is estimated to increase over the base level for scenarios 2, 3 and 4. This is expected since the removal of the railway subsidy would remove the farm level price distortion, resulting in lower feed grain prices for western Canadian livestock producers. It is anticipated that the lower prices would translate into increased sector net income. This conclusion is reinforced by the results of the two supply managed sectors net income (dairy and poultry). Since it is assumed that there would be no change in production in these sectors, the increase in net income would be due to decrease feed costs in western Canada. Since the supply managed sectors are concentrated in Ontario and Quebec, the total income increase in Canada would be rather small. Table 3 shows the estimated shadow values of land for the three prairie provinces. Although these numbers do have specific economic interpretations in simple linear programming models, it is not as straight forward given the complexity of CRAM. Nevertheless, it can be asserted that the shadow values are a measure of the marginal value of an extra hectare of cropland in the model (the rental value). The major problem with interpreting these values as an actual measure of land value is that marginal change in value refers to a marginal change in total welfare, rather than producer surplus.

In Table 3, the base scenario values are reported and the percentage change from this value is reported for the rest of the scenarios. The land shadow values are estimated to decline for all regions in all provinces in scenario 2. The reason for the decrease in scenario 2's shadow values is easy to
understand: the loss of the annual Crow subsidy of $720 million would not be totally compensated by the improvement in efficiency and the increase in net sector incomes in the beef and pork sectors. This is confirmed by the fact that scenario 2's objective function value is the lowest of the four scenarios.

However, the estimated land values generally increase in scenario 3. The exceptions are in Alberta wherein some regions the shadow values are estimated to decline. The shadow values of land calculated in scenario 4 is the same as scenario 2. Producers would likely incorporate the knowledge that the annuity payments would end after 10 years, and thus discount its value.

IMPLICATION

The production distortion from the WGTA subsidy are estimated to be relatively small. The quantitative analysis indicates that grain production would decline slightly (1-2 per cent) while oilseed and livestock production would rise slightly even in the most extreme scenario (eg a phase-out with no compensation). Consequently, the trade distortions of this programme are also estimated to be small. The largest impact would occur for coarse grain exports. The expanded livestock herd would increase the domestic consumption of feedgrains and reduced exports more than production. With the small production and trade effect, the world price impact of the WGTA subsidy would therefore be negligible.

These changes in trade patterns refer to a unilateral policy change. If there was a multilateral reduction in assistance the trade changes noted above would be intensified (ie more livestock and less cereals production). Most studies show that under a multilateral reduction in assistance, there would be a sizable rise in livestock and dairy prices and little change in grain prices.

While the production and trade impacts may be small, there are important income implications for grain and oilseed producers in Canada. Under certain scenarios there would likely be a large decline in net income and asset values. These losses are highly dependent on the nature of the compensation during the programme transition. The no-compensation option would likely cause large losses to the grain producers. Where compensation paid to producers which approximates the current level of payments to the railways, this study estimates that there would be a rise
in crop producers net income and cropland values. For individual producers, the basis for compensation (eg on exports, marketings or production) would also be an important consideration as to the income implications. In addition, there are considerable regional differences from these policy changes.

The grain handling and transportation system could also experience income and asset value declines by these programme changes. Lower volumes of grain would be marketed and shipped for export. The optimum location and size of elevators would likely be affected thereby requiring further consolidation. The magnitude and the distribution of the implications to the grain handling firms are not well understood.

From an international trade perspective, the modifications to the existing WGTA programme can be made in a way to decouple payments from production. The trade implications of this option, however, would appear to be little different from the current policy or even a pay the producer option. As a result there are few international gains — such as reduced exports or higher world prices — from changes to the WGTA or even its complete phase-out. The WGTA is close to a decoupled type of programme.

SUMMARY AND CONCLUSIONS

The Crow rate and its successor, the WGTA have been a fundamental part of Canadian agriculture policy for almost 100 years. The increasing concerns in Canada about its production distortions and its restriction on the structural adjustments in efficiency have more interest for possible changes to the programme. At the same time it must be recognised that the contribution of the programme on farm income in western Canada is substantial — the transfer represented close to 30 per cent of total net farm income in the prairies in 1989. Changes to the programme would impact quite differently on various producers and grain handling firms in the west. Hence there are differing views on whether and how it should be changed.

This study used a large regional programming model (CRAM) to quantify the impact of the changes in the WGTA. These included (i) maintaining the status quo, (ii) a phase-out with no compensation, (iii) pay the producer, and (iv) a buy-out using an annuity to producers.
Canadian Grain Transportation Policies

The international impacts from the programme appear to be modest. There would be reductions in grain production and exports, but these would be partially offset by increased oilseed and livestock production and exports. The net trade affect for Canada would be a small decrease (less than 1 per cent) in the value of exports of agricultural products. It is important to understand the linkages among commodities and the likely impacts from policy adjustments. For example, the increased livestock exports would likely go to different markets than current grain exports.

Changes in the method of payment or reduction in assistance would change production patterns on the prairies with a shift to more livestock feeding in response to the lower feed costs. If these changes occurred at the same time as a multilateral reduction in assistance to agriculture it would likely accentuate these trends, as livestock prices are estimated to rise faster than feedgrain prices under a more liberalised international agriculture.

Crop producers could face a substantial decline in net income and land values, if producers were required to pay the full cost of transportation and there was no compensation. However, higher freight rates with compensation near existing levels could result in higher net income and land values. Net income to livestock producers would increase in all cases.

In terms of the international proposals on 're-instrumentation', the WGTA provides a good example of a programme that can provide a similar level of assistance to the sector in a variety of ways. The trade impact from the changes, however may be small.

The implication of the type of policy adjustment on the other hand is very important to producers, as this has implications not only for net income, but more importantly for asset values.
REFERENCES


Table 1. Crop and livestock production and exports - results from alternative transportation scenarios

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<td><strong>Meat Exports (000 tonnes)</strong></td>
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Table 2. Net income for major agricultural sector in Canada - in million dollars

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<td>(Western Canada)</td>
<td>4257</td>
<td>3681</td>
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<td>779</td>
<td>813</td>
<td>801</td>
<td>813</td>
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<td>Dairy Sector</td>
<td>1955</td>
<td>1959</td>
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<td>Poultry Sector</td>
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<td></td>
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<tr>
<td>(Broilers Eggs &amp; Turkeys)</td>
<td>1935</td>
<td>1943</td>
<td>1941</td>
<td>1943</td>
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<td><strong>Total Agricultural</strong></td>
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<td>Net Income</td>
<td>10125</td>
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Table 3. Shadow values of land and objective function values

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<td>($ hectare)</td>
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CHAPTER 4

RECENT DEVELOPMENT IN JAPANESE AGRICULTURAL STRUCTURE AND ITS FUTURE PROSPECTS

Kenzo Hemmi*

STRUCTURAL ADJUSTMENT IN JAPANESE AGRICULTURE

Consumer expenditure on food and drinks in Japan has declined from 35.2 per cent of total consumption expenditure in 1960 to 24.1 per cent in 1987. This trend reflects a rapid increase in the per capita income of Japanese consumers. A more important fact, however, is the dramatic decline in net agricultural production. As a proportion of the Gross Domestic Product, agricultural production has declined from 9.8 per cent in 1960 to 2.0 per cent in 1985. Increases in food and agricultural imports, the development of food processing industries and the increasing popularity of eating out among Japanese explain the difference between the two trends above.

Recent trends indicate that the number of full time farmers has declined more rapidly than the number of farms. As is often cited, there has been an increasing number of part-time farmers in Japan. This trend can be explained by the following factors: (1) agricultural production has declined since 1985, (2) agricultural prices at the farm gate has declined since 1985, (3) the number of those who entered into agriculture after completing their education has declined rapidly over the 1965-1987 period.

Currently there are approximately 4 million farms in Japan and in order to maintain this number there should be approximately 100 thousand new entrants into agriculture every year. The information in Table 1 shows that in 1987 there were only 4,000 new entrants into farming compared to 72,000 in 1965. Table 1 also shows the extent to which Japanese agriculture is becoming more and more capital intensive.

About half of Japanese farm workers is over 60 years old and still adheres to farming. One of the reasons why these farmers are generally reluctant

* Professor, Asia University, Japan
to give up farming is that they view their farms as their most important assets. However, it is expected that farm lands will be subject to higher taxes in the near future. Consequently future farming activities might not be as attractive as in the past. Various sources suggests that about a fourth to a third of present farms will disappear in the decade to the year 2000. The rate of decline is also expected to increase after year 2000.

The share of total income derived from agriculture for the average farm household has declined from 44 per cent in 1965 to 13 per cent in 1987. This highlights the increasing importance of non-farm activities for the average farm households. The income of farm household has been larger than that of non-farm households. This is because there are generally more people per family in agriculture than in the non-agricultural sector. However, the per capita income of a fulltime farm labourer has generally been less than that of a fulltime labourer in the non-farm sector (see Table 2). As such, one cannot expect farmers to continue to work harder than their urban counterparts.

GOVERNMENT POLICY

At the end of World War II, Japan was in the midst of a severe food shortage. As a result, the Japanese government made every effort to increase food production. In a remarkably short period of ten years, Japan had attained a stable supply of food.

Since 1955 the focus of Japanese agricultural policy has gradually shifted from increasing food production to developing a healthy agricultural sector. With increasing food supplies, food prices have declined steadily and as a result, the income of farmers has deteriorated. After several years of deliberation, the Japanese government enacted the Basic Agricultural Law of 1961. This law prescribes that the basic objectives of Japanese agricultural policies are to increase productivity and to raise farm income to a level comparable to other sectors.

At the same time, the government had launched the 'Doubling National Income Plan' and the policy for opening up the Japanese economy; both contained in the Basic Guide of Trade and Foreign Exchange Liberalisation Programme of June 1960. The Japanese government tried to liberalise both the agricultural and the manufacturing sectors. By the end of the period of rapid economic growth only 23 food and farm commodities were under
residual import restriction. This figure compares favourably to that of France. The Japanese government thought that the target of the Basic Guide of Trade and Foreign Exchange Liberalisation was achieved.

The oil and grain crisis crippled the Japanese economy in 1972 and 1975. The Japanese were very surprised in finding that the self-sufficiency ratios of such important food commodities as wheat and soybean were extremely low, generally less than ten per cent. Japanese awareness of the extent to which the country was dependent on foreign supplies of food was further increased by the soybean embargo. Consequently the Japanese government redirected its policy from increasing productivity and promoting liberalisation to increasing food production by protecting agriculture. Since then, food security has become the primary objective of Japanese agricultural policy. Resolutions calling for an increase in the domestic food supply capacity were unanimously adopted in both the Upper and Lower Houses in 1980.

However, due primarily to the increasingly abundant food supply on the world market since 1980, the emphasis of government programmes has shifted quietly from increasing food production to one of increasing productivity. Several announcements by the Japanese Government in 1987 and 1988 have indicated that the Government has been trying to reform its agricultural programmes. A significant part of the present level of Japanese agricultural protection can be explained by the recent appreciation of the currency exchange rates. Prime Minister Nakasone accelerated the process of the reforms which, unfortunately, was stopped as a result of internal political problems (the recruit scandal). The Liberal Democratic Party was extremely unpopular and weak among Japanese. The Socialist Party which is more protectionist than LDP has gained more popularity recently. In the last election of the Upper House in the summer of 1989, candidates of both the LDP and the Socialist Party have promised that farmers would be protected from imports from overseas.

NEW DEVELOPMENT IN JAPANESE AGRICULTURAL ECONOMY

Rice is the symbol of food and agriculture in Japan. Due to surplus rice production since 1971, the Government has put in place a set aside programme. The acreage set aside has increased steadily to reach 791,000 hectares in 1988, representing 27 percent of the total area under rice production. Further increases in acreage set aside is likely to severely impede
on the maintenance of the present way of rice farming in Japan. As a result, farmers' organisations are very reluctant to accept further increases in acreage set aside. Hence, the rice programmes will soon be unworkable regardless of whether the Japanese market is made accessible to overseas rice growers. Moreover, only 5.3 per cent of rice producers sold more than 9 tons of rice (valued at less than Yen 3 million), 5 per cent of the total rice production was by farms which had no full-time worker, 17 per cent was by farms which had only one male (60 + years old) and/or a female full-time worker. When all these facts are taken into account, the future of Japanese rice production looks extremely gloomy.

Given the importance of rice in Japan, Japanese rice programmes have been at the centre of agricultural policy. Reforms of rice programmes would necessarily involve the relaxation of the entire government intervention policies in agriculture. The information in Table 3 shows that more than 70 per cent of poultry, pig and vegetable production involve farms which have at least one male full-time farm worker. These farms do not receive any support from the government and are not controlled by the government. As a result many young and promising farmers are moving away from the production of controlled products to the production of uncontrolled products.

The above trend has been particularly apparent in several areas. For example, the number of ornamental plant producers has increased from 21,000 in 1980 to 27,000 in 1987 although the imports of cut flowers and other ornamental plants have increased from US$17 million to US$58 million over the same period. Mushroom production is another such example where production has increased very rapidly. The number of horticultural farms equipped with glasshouses has increased from 172,000 in 1975 to 254,000 in 1987. Even among rice producers the emphasis has shifted from the production of directly controlled standard rice to the indirectly controlled quality rice.

Japanese consumers are 'in the midst of a glorious spending boom.' As a part of this boom 'Japan's consumers have splashed out on gourmet food.' (Economist September 9, 1989). In 1990, about 10 million Japanese will travel overseas and will taste foods and drinks in other countries. In this respect, it is predicted that the Japanese consumer will have a more cosmopolitan taste in the future. Already, the Japanese food market is expanding extremely rapidly. Progressive (young) farmers are trying to take a reasonable share in this expanding Japanese food market. Some of them
are trying to export their products too.

The number of children from farm families who were engaged in farming after finishing their schooling declined steadily from 68,000 in 1965 to 9,900 in 1975 and to 3,500 in 1988. However, only a small percentage of those who were engaged in farming after finishing their education in 1965 were graduates of colleges and universities compared to more than 10 per cent in 1975 and about 30 per cent in 1988. Recent surveys show that about 70 per cent of the children of full-time farm families who are studying in colleges and universities expressed their intention of going into farming after finishing their education. They generally would like to be involved in livestock farming, vegetable growing and ornamental plant production. This trend indicates that Japan will have fewer and fewer farmers but with more education.
### Table 1. Main Indicators of Japanese Agricultural Economy

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<td>(1985 = 100)</td>
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<td>732</td>
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<td>(US$ million)</td>
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<td>(US$ million)</td>
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<td>Full-time Population in</td>
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<td>32</td>
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<td>5</td>
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<td>their education (000)</td>
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<td>Arable land (000 hectares)</td>
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<td>Total Agricultural Capital</td>
<td>240</td>
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<td>Formation (Yen billion)</td>
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### Table 2. Farm Household Economy

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<td>4.56</td>
<td>4.40</td>
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<td>Gainfully occupied population per farm household</td>
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<td>2.66</td>
<td>2.55</td>
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<td>Income per farm household (a)</td>
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<td>Agricultural income per farm household (b)</td>
<td>Y'000</td>
<td>365</td>
<td>508</td>
<td>1146</td>
<td>952</td>
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<tr>
<td>(b)/(a)</td>
<td>%</td>
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<td>32</td>
<td>29</td>
<td>17</td>
<td>15</td>
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<td>Per capita income of farm household population (c)</td>
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<td>Per capita income of worker's household (d)</td>
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<td>194</td>
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<td>1111</td>
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<tr>
<td>(c)/(d)</td>
<td>%</td>
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<td>112.3</td>
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<tr>
<td>Per capita income of gainfully occupied population in farm household (e)</td>
<td>Y'000</td>
<td>309</td>
<td>600</td>
<td>1555</td>
<td>2223</td>
<td>2815</td>
</tr>
<tr>
<td>Per capita income of gainfully occupied population in worker's household (f)</td>
<td>Y'000</td>
<td>524</td>
<td>891</td>
<td>1931</td>
<td>2817</td>
<td>3431</td>
</tr>
<tr>
<td>(e)/(f)</td>
<td>%</td>
<td>59.0</td>
<td>67.3</td>
<td>80.5</td>
<td>78.9</td>
<td>82.0</td>
</tr>
</tbody>
</table>
Table 3. Value of Agricultural Production by Type of Farm  
(1987: per cent)

<table>
<thead>
<tr>
<th>Classification I</th>
<th>Classification II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farms with at least 1 male full-time worker*</td>
<td>Farms with only an old and/or female full-time worker</td>
</tr>
<tr>
<td><strong>Total Agric.</strong></td>
<td>57</td>
</tr>
<tr>
<td><strong>Rice</strong></td>
<td>28</td>
</tr>
<tr>
<td><strong>Vegetables in house</strong></td>
<td>81</td>
</tr>
<tr>
<td><strong>Vegetables in field</strong></td>
<td>61</td>
</tr>
<tr>
<td><strong>Fruits</strong></td>
<td>62</td>
</tr>
<tr>
<td><strong>Silk</strong></td>
<td>56</td>
</tr>
<tr>
<td><strong>Poultry</strong></td>
<td>71</td>
</tr>
<tr>
<td><strong>Pig</strong></td>
<td>80</td>
</tr>
<tr>
<td><strong>Dairy</strong></td>
<td>90</td>
</tr>
</tbody>
</table>

* Full-time farm workers are those who are between the ages of 16 and 60, and work 150 days or more a year on their farm.
PART II

Liberalisation Initiatives and Experiences
INTRODUCTION

There is a commonly-held presumption that if markets for temperate food products were to be liberalised as a result of the Uruguay Round of multilateral trade negotiations, developing countries would be harmed. The basis of this view is that, as a group, developing countries are net importers of those food prices in international markets and their food import bills would be higher.

The purpose of this paper is to show that for a number of reasons this is too restrictive a view of the effects of including agriculture in the Uruguay Round. In fact it is quite possible the majority of developing countries would be net beneficiaries of such a liberalisation. The paper uses standard economic analysis to demonstrate key steps in the conceptual argument leading to that opposite conclusion. It begins with the conventional, static, partial-equilibrium view, adds distributional and risk considerations, and then raises further issues that add increasingly to the probability that developing countries could gain from the inclusion of agriculture in the Uruguay Round. Empirical modelling results (reported elsewhere) show that even when attention is confined just to the markets for temperate food staples, it is plausible that virtually all developing countries could benefit from a global liberalisation of those markets and that the vast majority of the world’s poor would be better off. The second section refers to these studies and points to areas where further empirical research is needed to improve our understanding of the likely effects of reform. Some policy implications of the analysis for both rich and poor countries are drawn out in the final section.

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SOME CONCEPTUAL STEPS IN THE ARGUMENT
The conventional view of effects of OECD food trade liberalisation

Figure 1 depicts the conventional view of what would occur if the advanced industrial countries alone liberalised their protectionist policies toward food trade. Suppose that following the international price rise the domestic producer and consumer prices in a food-importing developing country rose from $P_0$ to $P_1$. (Throughout the P's refer to the price of food relative to the price of other tradables. For the moment assume there are no distortions in the developing country.) Then producer surplus would rise by area $abfg$ while consumer surplus would fall by area $acdg$. The net loss to this economy therefore is seen as area $bcdf$. Note, though, that the food import bill would be greater only if the price elasticity of excess demand for food is less than unity.

However, it need not be the case that this developing country continues to be a net food importer. Suppose, for example, that the post-liberalisation price is $P_2$ rather than $P_1$. In that case it is possible that the country's loss would be less than if the price rose only to $P_1$. The required condition is that area $fde$ is less than area $eih$, and the net welfare loss in this case is area $bce$ less area $eih$. It therefore follows that if the international price rose sufficiently, this country could even be a net beneficiary. If it rose to $P_3$, for example, the net gain would be area $ejk$ less area $bce$. And food would be a net contributor instead of a net drain on foreign exchange earnings.

Needless to say, an undistorted developing country which is a net food exporter at the pre-liberalisation price gains unequivocally from liberalisation. If $P_2$ and $P_3$ were the pre- and post-liberalisation prices, for example, then the net gain to that exporting country would be area $hijk$ if the price change is fully transmitted. (If none of the change was transmitted to the domestic market, the gain would be confined to the export tax revenue which is $hi$ times the international price rise $P_2P_3$).

Net economic welfare measured in this way is not the only effect on society's well-being. Many people would also be concerned about the effects of food trade liberalisation by the OECD countries on the distribution of well-being within the developing country and on the instability of domestic food prices. These are considered in turn.
Distributional considerations within developing countries

Focussing only on the net national welfare change masks the important fact that there are large welfare transfers between groups within each developing country. Typically, the gain to producers and the loss to consumers, following a rise in international food prices that would result from agricultural trade liberalisation in OECD countries, will be much greater than the net change in national welfare which, in the absence of distortions in the developing country, is simply the difference between these two. This is especially so if a developing country is and remains close to self sufficient in food products. As well, in most low-income countries the number of people who are net sellers of food is well above the number who are net buyers of food, and the former group is usually poorer on average than the latter group. Thus in terms of numbers of people affected and in terms of income inequalities, the food price rise might well be judged to be an improvement in social conditions.

Risk considerations associated with stability of food markets¹

If OECD countries were to liberalise their food markets, this would mean reductions in the degrees to which they export their domestically generated market instability and insulate their domestic market from international price fluctuations. The net effect of several large countries liberalising in this way would be a reduction in the degree of fluctuation in international food prices. Insofar as developing countries transmit those fluctuations to their own domestic markets, and insofar as their food producers and consumers are averse to risk, welfare in those countries would be enhanced by the reduction in food price instability that would follow from the reductions in protectionism and insulation in OECD countries.

Thus taking distributional and risk considerations into account as well as standard economic welfare measures ensures that it is even more likely that even food-deficit developing countries would be better off, in terms of overall social well-being, from a liberalisation of food trade following the Uruguay Round.

¹ The issue of market stability is discussed in more detail in Tyers (1990).
Dynamic effects through induced innovations

The argument does not end here, however, because the above comparative static view ignores the dynamics of innovation. It is likely that the rate of induced technical change in a sector is positively related to the sector's expected mean level of profitability (Ruttan 1982, Alston, Edwards and Freebairn 1988). It is probably also negatively related to the expected variability of profits through time. Therefore the permanent reduction of protection which would lower domestic food price levels (and perhaps their stability) in industrial countries on the one hand, and the once and for always increase in the level and stability of food prices in developing countries on the other, following a liberalisation of OECD agricultural policies, is likely to boost agricultural productivity growth in developing countries while slowing it in industrial countries. (This would be especially so if some of the gains to OECD countries from their trade liberalisation were to be redistributed in the form of increased foreign aid to agricultural research programmes in developing countries.)

The welfare effects of this in a developing country are shown in Figure 2 where it is assumed (a) that the rise in the average international price for food and the greater stability of that price level has induced a shift in the country's food supply curve, for example from \( S \) to \( S' \); (b) that the net effect of the faster shift of food supply curves in developing countries as a group, the slower shift in the food supply curves of industrial countries, and the increased excess demand for food in industrial countries because of their food policy reform, is to raise the mean level of the international price of food; and (c) that the increase in the international price is passed on to the domestic food market in the developing country.

In the case of a food-importing developing country faced with a rise in the price of food from \( P_0 \) to \( P_1 \), consumer welfare is still reduced by area acdg in Figure 2 but producer welfare is increased not just by area abfg but also by area mqf less the amortised cost of the research which generated the shift in the supply curve (assuming producers paid for that research). It is possible that the gain in producer welfare could outweigh the loss in consumer welfare in this dynamic case, even if the country were to remain a net food importer. This would be the case if area mqf minus the amortised cost of research area bcd, which is more likely the larger the shift in the supply curve and the smaller the cost of the investment required to generate the shift, ceteris paribus.
For the food-exporting developing country, dynamic considerations simply add further to their positive net benefit from the international food price rise.

**What if developing countries also liberalised their own food markets?**

So far it has been assumed that developing countries do not distort their own food markets. To the extent that they in fact do, the economic gains to developing countries could be even greater if those distortions also were to be removed. In the case of foods grown in temperate zones, developing countries on average (across all countries and commodities) probably keep the domestic price level closer to the international price level than OECD countries but still above it at official exchange rates (Tyers and Anderson forthcoming). Thus a liberalisation of those markets as well would raise further the international price of temperate foods in aggregate. In addition, there would be the usual gains to each liberalising country from removing differences in rates of assistance/taxation between the various food markets within its food sector.

Furthermore, if all developing countries reduced their market-insulating behaviour, the instability of international food prices would be reduced even more than if just OECD countries were to liberalise. While the latter may raise the extent of price fluctuations in the developing countries that currently have the most insulated food markets, it would reduce fluctuations in the somewhat more-open, less-insulated economies.

Whether food consumers or producers in developing countries would be better or worse off depends on whether the terms of trade change more or less than offsets the effect on domestic prices of eliminating the country's own food policy. The net change in national economic welfare also depends importantly on whether prices in other sectors are distorted and whether the net distortion in the relative domestic price of food is increased or decreased following the Uruguay Round, a point to which we now turn.

**What if developing countries have distorted industrial and foreign exchange markets?**

The World Bank/IFPRI study led by Krueger, Schiff and Valdes (1988) shows clearly that agricultural production is effectively taxed and food consumption subsidised in developing countries not so much directly but rather in indirect ways, particularly via manufacturing protection policies
and overvalued official exchange rates. According to the Krueger et al. estimates, these indirect ways of lowering the relative price of food much more than offset the positive effect on the food sector of export taxation of non-food primary products. Reducing the latter distortions would give a tremendous boost to farmers in developing countries, and alone would be sufficient to turn many food-importing poor countries into food exporters. In the absence of these policy distortions in non-food sectors such developing countries (i.e. those with a natural comparative advantage in food production) would gain unequivocally from the international price change that would accompany OECD agricultural trade liberalisation.

Even if such a country does not alter its price distortions in non-agricultural sectors, it may still gain from an increase in international food prices provided a sufficient proportion of that increase is transmitted to its domestic market. This point is illustrated easiest with the help of the general equilibrium diagram in Figure 3. The slope of line PC represents the pre-liberalisation international price of other tradables relative to food.1 If the developing economy is distorted by, for example, trade restrictions which alter its domestic price ratio to the slope of the tangent at P', then instead of producing at P and consuming at C, as it would under free trade, this country produces at P' and consumes at C'. This means instead of exporting the quantity PE of food and importing EC other tradables, the economy imports C'E' food and exports E'P' other tradables. And its overall welfare is lower than it would be in the absence of its own trade restrictions, as indicated by the indifference curve through C' being below that through C.

If this economy did not restrict trade, its welfare would increase following a rise in the international price of food from the slope of line PC to the slope of line P'C': production would shift from P to P' and consumption from C to C', the latter representing a higher level of national economic welfare than at C. Even if it is using trade restrictions of the sort depicted at P' and C' in Figure 3, this economy could be better off as a result of OECD agricultural trade liberalisation provided it transmits a sufficient proportion of the rise in the relative price of food internationally to its domestic market, (and/or domestic price support for other tradables is lowered).3 Indeed, it is possible for this country to gain from that relative

2 For simplicity, and without loss of generality, non-tradables are ignored in this section. They are discussed in detail in Anderson and Tyers (1990).

3 The importance of the extent of price transmission to the sign of the net welfare effect of a terms of trade change for a distorted economy has been pointed out by Tyers and Falvey (1989) in a somewhat different context.
price change even if the developing country remains an importer of food. In terms of Figure 3, all that is required is for $P'$ to move sufficiently toward $P$, as a result of the higher relative price of food domestically, such that the new consumption point to the left of the new production point along a ray parallel to $P'C_0$ and $P'C'$ is on a community indifference curve further from the origin than the curve through C'.

An important corollary to the point just made is that even if the country would have been a net food importer under free trade and has anti-food sector policies in place, it may be made better off by OECD liberalisation which worsens its terms of trade if enough of the increase in the relative price of food internationally is transmitted to its domestic market (and/or domestic price support for other sectors is lowered enough). This is a specific example of one of Bhagwati's (1971) general points that apparently paradoxical outcomes are possible in a distortion-ridden economy.

THE NEED FOR EMPIRICAL RESEARCH

Unambiguously, a food-exporting developing country would gain from OECD food trade liberalisation, regardless of whether its own economy is distorted and regardless of how much of the increase in the relative price of food internationally is transmitted to its domestic market, ceteris paribus. What the above analysis shows is that it is also possible that a food-importing developing country could gain from OECD food trade liberalisation. Whether any particular food-deficit country would gain is an empirical question that cannot be answered a priori. This puts the burden on quantitative modellers to address this question.

Early partial-equilibrium modelling work, including studies by the present author (e.g. Tyers and Anderson 1988), suggested that as a group developing countries might be net losers from OECD food trade liberalisation. General equilibrium modeller such as Burniaux et al. (1985,1988) and Loo and Towers (1989), on the other hand, report results suggesting developing countries as a group might gain from that reform. These two sets of results are easy to reconcile in the light of the above analysis: the first corresponds to Figure 1 and the second to Figure 3. That is, the general equilibrium modelling result also incorporates the effects of policies assisting non-agricultural producers in developing countries.

The point made in a section earlier, that product prices and hence price
and trade policies also affect the rate of technical change, has not been taken into account in the above-mentioned empirical studies. It has been, however, by Anderson and Tyers (1990). They suggest that long-run price elasticities of food supply may be effectively greater than those traditionally measured because of the responsiveness of productivity growth to permanent price shocks. If those elasticities for individual commodities were greater by 0.5, this would be sufficient to ensure that developing countries as a group would not lose from OECD food trade liberalisation, as measured by their model. They also show, incidently, that developing countries could be substantial net gainers if in addition they were to reduce the insulation of their domestic markets from international food price changes in response to OECD food policy reform.

As Gardner (1989) and Goldin and Knudsen (1990) point out, there is an obvious need for further empirical work in this area to obtain a clearer picture of which developing countries are likely to be net beneficiaries of OECD food trade liberalisation and by how much. But the available studies at least illustrate the main point of this paper, namely, that many more developing countries than just the current food-exporting ones would benefit from such a reform - even though they may remain net importers of food.

**POLICY IMPLICATIONS**

In addition to many developing countries - including some food-importing ones in the Asian-Pacific region - being net beneficiaries of high international food prices resulting from OECD policy reform, three further points should be reiterated. First, the income redistribution within developing countries between food consumers and producers, as a result of liberalisation, is likely to improve equity. Second, risk-averse actors in relatively open economies would be better off because, following liberalisation, international food prices would fluctuate less - indeed less than in all but the currently most insulated economies, according to Tyers and Anderson (forthcoming). A third, both the number of developing countries that would be net gainers and the extent of their gain would be larger, the more these countries were prompted by OECD reform to liberalise their own policies which discriminate against domestic food production.

If it is true that not only the world economy but also developing economies
and especially their farmers would be better off if food policies were liberalised under the Uruguay Round, it remains to convince developing country governments to support agriculture's inclusion on the GATT agenda. It is unlikely to be insufficient to demonstrate that their economies would benefit in the sense that their farmers could gain more than their food consumers would lose, for many of these governments clearly have chosen unilaterally to forego economic benefits by adopting price, trade and exchange rate policies which harm their farmers. They have done this presumably because those policies yield political benefits to those governments which more than outweigh the political costs (Anderson and Hayami 1986; Anderson 1989). Other carrots therefore need to be found.

It happens that OECD countries would benefit more if developing countries joined them in liberalising their food markets than if they abstained. They would benefit not just in a net economic welfare sense but also politically in that OECD producer prices would not have to fall as much if developing countries also reform their food price policies (Anderson and Tyers 1990). Nor would OECD export prices of manufactured goods fall as much if resources in developing countries are attracted back into agriculture so that those countries net imports of OECD manufactured goods expand (Burniaux and Waelbroeck (1985), Mathews (1985)). In addition, OECD countries would enjoy greater stability in international food prices. Developing countries might stress these facts in their negotiations with OECD countries, and seek from them some liberalisation of other markets of interest to developing countries such as tropical primary and processed products and textiles, clothing and footwear.

There is a clear lesson to be drawn from this analysis for PECC member countries. Within the PECC group of countries the Cairns Group members and the United States have been virtually alone in advocating freer agricultural trade during the Uruguay Round negotiations. What the above discussion suggests is that several other developing country members of PECC are likely to benefit from agricultural reform by OECD countries. Hopefully they will come to realise that soon and lend support to that cause before the round is over.
REFERENCES


Tyers, R. (1990), 'Agricultural Trade Reform and the Stability of Domestic and International Feed Prices', Paper presented to an IFPRI conference on The GATT Negotiations on Agriculture and the Developing Countries, Montreaux, 30 May-1 June.


Figure 1: Comparative static partial equilibrium effects on a food-importing economy of a higher international price for food.

Price of food relative to the price of non-food tradables

[Diagram showing the effects on the price of food and quantity of food with different price points and quantities.]
Figure 2: Dynamic partial equilibrium effects on a food-importing economy of a higher international price of food
Figure 3: General equilibrium effects in a developing country of a higher international price for food with and without reform to its own non-food policies.
CHAPTER 6

IMPACTS OF TRADE AND EXCHANGE RATE POLICIES ON CHINESE AGRICULTURE

Will Martin and Peter G. Warr*

INTRODUCTION

As the Chinese economy continues to develop, its dependence on international trade will almost certainly increase. Given its resource endowments, China can be expected to become a major exporter of manufactured goods and importer of agricultural products (Anderson and Tyers 1987). Certainly, agriculture can be expected to decline in relative terms and manufacturing and services to increase in both absolute and relative terms. Some observers have worried whether, given China's enormous size, international markets could accommodate the effects of rapid growth in China's imports or exports without major disruption. While these fears are probably misplaced, there seems little doubt that China will become an increasingly important participant in international agricultural markets. In this paper we focus on the role of China's own trade and exchange rate policies in influencing this outcome.

The implications of pricing policies for China's agricultural trade were examined by Anderson and Tyers (1987) who reported initial estimates of nominal rates of assistance for China's agricultural sector. As they noted (1987, p145), the effects of distortions in agricultural trade will be influenced by the existence of protection in other sectors, and by the behaviour of the exchange rate. The purpose of this paper is to examine the implications that trade and exchange rate interventions in Chinese agriculture and industry have the Chinese agricultural sector.

The subject of this study is related to that of the World Bank comparative study of the political economy of agricultural pricing policies (Krueger, Schiff and Valdes 1988). This study differs, however, in focussing on a

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Details of the authors' general equilibrium model have been omitted from this edited version, but can be obtained from the authors.
socialist economy, and in its methodology. While the World Bank studies used an elasticities model to analyse the indirect effects of trade distortions and trade imbalances, the present study uses a multi-sector general equilibrium model of the post-reform Chinese economy. The World Bank study identified a general pattern from a sample of eighteen developing market economies. Of interest is whether this pattern (where direct trade interventions discriminate against the agricultural sector, and where indirect effects resulting from protection elsewhere have an even larger negative effect on the agricultural sector) carries over into a post-reform socialist economy.

An important finding of recent studies of protection in the Chinese agricultural sector (eg Anderson and Tyers 1987; Webb 1989) is that most agricultural commodities receive negative direct assistance in China. While it is widely known that parts of the industrial sector receive positive assistance, no comprehensive evaluation of the combined effects of these interventions on the Chinese agricultural sector has previously been undertaken.

The absence of previous estimates of the effects of protection policies on the Chinese agricultural sector reflects, in part, the difficulties in obtaining adequate information on the nature and extent of this intervention. Even where this information has been available, there was considerable difficulty in determining the consequences of price distortions in a planned economy where prices performed primarily an accounting function. Only since the development of the two-tier pricing system (Byrd 1987; Sicular 1988, Wu and Zhao 1987) has it become possible to assess the effects of intervention through its effects on prices.

Given the complexity of the institutional arrangements involved in the Chinese economy, and particularly the foreign exchange and foreign trade systems, a short summary of the main features of these systems is provided in the second section of this paper. The nominal and effective rates of protection estimated for each major sector in the economy are presented and discussed in the third section. Then, in the fourth section, the implications of these protective measures for sectoral output and trade levels are considered.
PLAN AND MARKET IN THE CHINESE ECONOMY

Internal markets

A major thrust of the reforms in China's economy since 1978 has been to decentralise economic decision-making away from central planning towards provincial governments and producing enterprises. This process has involved increased use of markets as a means of allocating resources, although planning by central and provincial authorities remains very important (Naughton 1985; Wong 1985), particularly in determining the distribution of gains and losses.

The extent to which decision-making has been decentralised varies across sectors. It appears, for instance, that decision-making has been substantially decentralised in the agricultural sector (Sicular 1988, Lardy 1983). Progress has been viewed as having been somewhat less rapid in the industrial sector, (Naughton 1985, Wong 1985), Chinese Economic System Reform Research Institute (CESRRRI) 1987), although recent work suggests that secondary market prices now have an important influence on industrial sector decisions (Byrd 1987, Wu and Zhao 1987). The foreign trade system has also been substantially decentralised, although significant elements of central planning remain (World Bank 1988).

The introduction of two-tier pricing has been a crucial development. Part of total production takes place under a planning system in which specific quantities of output are supplied at specified official prices, and part of consumption demand is met by allocations or rationing at state-determined prices. Under this system, enterprises are generally able to produce additional output at market, rather than official, prices and consumers are able to buy or sell additional amounts at market prices. As Byrd (1987) and Sicular (1988) have argued, in principle, only the prices prevailing at the margin have any effect on short-run output levels under a system of legal secondary markets such as those developed under the dual-tier pricing system. In fact, the existence of these legal markets greatly simplifies the analysis relative to the case of illegal parallel markets considered by Roemer (1986).

Foreign trade

Prior to 1978, the Chinese economy was relatively closed, with decisions on exports made within the planning process, in accordance with an assessment of the level of imports required for particular purposes. All
foreign trade was channeled through centralised Foreign Trade Corporations, with minimal opportunities for direct interaction between producing enterprises and importers of Chinese exports.

By 1989, Shan (1989, p43) was able to conclude that '... a decentralised foreign trade system with a mechanism of regulatory control has taken shape and has become institutionalised'. The following account of China's export and import system is based heavily on the comprehensive World Bank (1988) study which provides a 'snapshot' of the system operating in late 1986. Other sources and author interviews have been used to update the assessment.

The export regime

Despite substantial reform and liberalisation since 1978, the 'command plan' system still covered 120 commodities, including coal, oil, agricultural products, textiles, garments and handicrafts in late 1986, and 'command plan' exports accounted for an estimated 70 per cent of the total value of export (World Bank 1988).

An influential 1984 report on reform of the trade system by the Ministry of Foreign Economic Relations and Trade (MOFERT) recommended a number of reforms, some of which have begun to be implemented. The major recommendations include (World Bank 1988):

- direct participation by large producing enterprises in foreign trade;
- eliminating the state's responsibility for profits and losses in foreign trade; and
- adoption of an agency system for Foreign Trade Corporations.

Direct participation by selected producing enterprises in foreign trade was strongly endorsed by the World Bank (1988). The 'airlock' imposed by forcing enterprises to deal through separate Foreign Trade Corporations prevented producing enterprises from obtaining necessary information from buyers about production techniques and product quality. Some larger producing enterprises are now allowed to engage in foreign trade on their own account.

An important move towards achieving the second objective was made
through the introduction of an experimental system for exports from several major sectors in early 1988. Under this system, subsidies for exports were eliminated for exports of apparel, light industry, arts and crafts, and mechanical and electrical (Chan 1989). Instead, Foreign Trade Corporations are now able to retain a much higher percentage of the foreign exchange earned from exports in these categories (75 per cent for apparel, arts and crafts and light industry, and 100 per cent for some mechanical and electrical exports).

In 1987, requirements that local Foreign Trade Corporations be responsible for their own profits and losses were strengthened (Shan 1989), reducing the degree of direct central government intervention in export trade. The link between world prices and domestic prices for exports was also strengthened in 1988 by the introduction of higher rates of foreign exchange retention for exports above target levels.

**The import regime**

The import regime appears to have undergone relatively little change in recent years. The key features of the system are:

- command plan imports of seven key raw materials - steel, chemical fertiliser, rubber, timber, tobacco, grain, polyester and other synthetic fibres (World Bank 1989);
- central allocation of foreign exchange for imports on priority investment projects;
- allocations of foreign exchange for other priority imports of raw materials, spare parts and equipment; and
- non-centrally funded imports or imports subject to import licensing.

The World Bank estimated command plan imports to be around 40 per cent and non-centrally funded imports to be 30 to 40 per cent of total imports in 1986. From interviews by the author in June 1988, it appeared that central purchases of many commodities had declined markedly since that time, with a corresponding increase in local orders, although some recentralisation appears to have occurred since that time in response to 'disorder' at the peak of liberalisation.

Non-plan imports are divided into restricted and non-restricted goods. Restricted goods, of which there were 45 (World Bank 1988) included most
of the command plan imports (e.g. steel, rubber, timber, synthetic fibres, tobacco), 'luxury' consumer durables such as motor vehicles, televisions and refrigerators, and assembly lines for such 'luxury' consumer durables.

Since the primary objective of import licensing is to keep the current account in reasonable balance, the extent to which it constrains imports will depend upon the seriousness of imbalances in the exchange rate, and in domestic spending. For restricted goods under the import plan, an import licence can generally be obtained relatively readily (World Bank 1988), while applications outside the plan are subjected to more careful scrutiny. While the total imports by a province or enterprise, as well as imports of particular goods are apparently constrained by import licensing, it appeared, in 1986 at least, that a restricted import with suitable finance, and for which no domestic substitutes were readily available, would eventually receive approval. Under these conditions, imports are essentially being constrained by the general shortage of foreign exchange rather than the commodity-specific import licensing system.

The overall pattern of the tariff schedule appears to be broadly consistent with the structure of import licensing, with those goods essentially banned under the import licensing system (such as motor vehicles) facing very high tariffs (200 per cent in the case of motor vehicles). However, given the range of control instruments available to the authorities, estimation of prices is likely to be necessary if a comprehensive picture of the effects of trade distortions in China is to be developed. We report the results of such a comparison in a later section.

**The foreign exchange system**

The foreign exchange system in China introduces an additional source of divergences between domestic and world prices. A persistent policy of exchange rate overvaluation has systematically undervalued exports and, by inducing a shortage of foreign exchange, restricted the availability of imports and raised their prices on secondary markets. In this way, the foreign exchange system has driven a price wedge between broad classes of importable and exportable commodities, as distinct from the numerous differentials induced by the various control mechanisms used in the foreign trade system.

Since 1979, the foreign exchange system has been substantially reformed. A major effective devaluation, at least for trade related transactions, was
implemented with the introduction of the Internal Settlement Rate for Trade in 1981. The 1981 reforms, however, also involved a highly centralised system of foreign exchange control with tight restrictions on holding of foreign exchange (Zhang 1987). Successive devaluations resulted in the official exchange rate being devalued from 1.49 Yuan/US$ in 1980 to 3.72 Yuan/US$ in 1986. The exchange rate was pegged to the US dollar at 3.72 Yuan/US$ from July 1986 to December 1989 when it was devalued by 21 per cent.

A particularly important institutional change has been the introduction of legal secondary markets for foreign exchange. The existence of these Foreign Exchange Adjustment Centres in each province allows foreign exchange to be transferred between enterprises to reflect differences in its value in each use, and reduces the waste resulting from hoarding of foreign exchange. Some degree of arbitrage between centres is possible, and reportedly keeps the extent of divergences between provincial markets relatively small.

There are a number of clear indications that the exchange rate has been substantially overvalued. One is the 'shortage' of foreign exchange which necessitates a policy of strong controls on its use and retention (Zhang 1987). Such a shortage arises because, at the official rate of exchange, imported goods are artificially cheap, and selling goods on the export market is not sufficiently attractive to generate the volume of imports demanded.

Another indication of overvaluation is provided by the substantially higher rates apparently prevailing in the secondary markets for foreign exchange. The prevailing secondary market rate in 1988 was estimated by the State Price Bureau (1988) to be 4.7 Yuan/US dollar. In March 1989 the rate on the Shanghai secondary market for foreign exchange was reported¹ to be around 6.6 Yuan/US dollar, well above the official rate of 3.72 Yuan/US dollar and subsequently² rose to around 7.0 Yuan/US dollar prior to a decline in late 1989. Even after the devaluation of the official exchange rate in December 1989, the secondary market rate remained above the

² China Daily, 3 December 1989.
official rate. Since transactions in these secondary markets are a legal means of transferring foreign exchange between entities, these rates do not reflect the risk premium likely to be associated with black market transactions. Rather, such high rates in the secondary market would appear to reflect a very marked overall shortage of foreign exchange.

Structure of Industry Protection

As discussed above, trade distortions in the Chinese economy arise from both the foreign exchange system and the foreign trade system. The structure of the foreign exchange system allows for the imposition of protection (tariffs or subsidies) on imports and taxes (or effective subsidies) on exports. These trade distortions may vary from commodity to commodity and even from enterprise to enterprise. The foreign exchange system also allows for the imposition of trade taxes. In the absence of foreign exchange retention arrangements, it imposes a uniform tax on all trade—raising the prices of imports and lowering the prices of exports. Once foreign exchange retention arrangements are introduced, these taxes become non-uniform, varying by region, by type of enterprise and by commodity.

The two major components of total protection — exchange rate protection and trade interventions — can be considered either individually or together. One approach is to consider the effects of all distortions relative to world prices at some estimated equilibrium level for the exchange rate. Another approach is to consider the effects of these two distortions separately. In this paper, the effects of the two distortions have been considered together in calculating the effects of total trade distortions on relative prices in the economy. The first step in calculating the effects of these distortions was to calculate the implied nominal rates of protection.

Nominal rates of protection

In the late 1980s there were two main differences between China's price structure and international prices. First, the domestic prices of primary products, including most agricultural products, wood and energy products (e.g. coal, crude oil and petroleum products), were generally lower than their international prices, converted to domestic currency at the official exchange rate. This was also true of the prices of metallurgy products and building materials. Second, the domestic prices of most chemical products, machines and manufactured goods were close to or higher than world price levels. A similar description was also applicable to individual sectors. In
the textiles and clothing sectors for instance, the prices of cotton yarn and grey woven cotton were lower than world prices and the prices of dyed woven cotton and clothing were close to or higher than the corresponding world prices.

This price structure, in which more highly processed goods were protected relative to primary products, had developed under an industrialisation policy which was biased towards industry and against agriculture and, within industry, was biased towards manufacturing sectors and against raw material extraction and processing sectors. The cascading structure of protection resulting from this combination of policies is typical of developing countries anxious to promote manufacturing. The prices of manufactured output are raised relative to agricultural prices and prices of inputs used in manufacturing sectors are kept low. Cheap agricultural products reduced costs of production in manufacturing.

Profit rates in primary sectors were substantially lower than the economy-wide average. Some primary commodities, including energy and mineral products, even suffered occasional heavy losses, whereas manufacturing sectors, as a group, reaped consistently high profits. Until the mid 1980s, the taxation and tariff systems strongly reinforced this imbalance in the price structure.

Until the mid 1980s, China's taxation system was mainly based on a turnover tax. Primary or less processed commodities were taxed at low rates in order to keep their prices low. The more a product was processed, the more it would be taxed, and the higher its price would be. Therefore, industry, and especially manufacturing, had been the main source of government revenue before the early 1980s. The relatively high prices of manufactured goods were partly a result of this taxation system. Moreover, since the world prices of raw materials were frequently higher than the controlled domestic prices (at the official exchange rate), imports of these goods involved losses. To provide cheap inputs to the domestic producers, the government subsidised the importers. Hence, the domestic manufacturing industries could be protected from international competition and still maintain low input cost and high prices and profits.

One simple method of summarising the impacts of various intervention measures is the nominal rate of protection (NRP). This measure indicates
the extent to which domestic prices differ from international prices. For commodity \( j \), the NRP, denoted \( N_j \), is given by

\[
N_j = \frac{(p_j - P_j)}{P_j},
\]

where \( p \) is the domestic price and \( P_j \) is what the price would be in the absence of protection, sometimes called the free trade prices. This hypothetical free trade price, \( P_j \), is equal to the international price of the commodity adjusted by an exchange rate to convert this price into domestic currency. The absolute magnitude, and even the sign of \( N_j \) for any one commodity will clearly depend on the exchange rate used in this calculation.

Two methods for estimating the free trade prices of traded commodities are in common use. One method looks at official tariff and export tax rates, and assumes that observed market prices differ from free trade prices by

\[
p_j = P_j(l + t_j)
\]

where \( t_j \) is a tariff in the case of an import and \(-t_j\) is the rate of export tax in the case of an export. The second method makes price comparisons between domestically produced goods and similar goods traded internationally. Both methods are problematic. Use of official tariff rates is clearly appropriate only when tariffs, and not quantitative restrictions, are the instruments of protection. When they are not, this method breaks down. This method also faces problems when smuggling causes domestic market prices to differ from border (free trade) prices by less than the amount predicted by the official tariff rate. The price comparison method faces the practical problem that applying it is more time consuming. It is often difficult to identify the precise commodity traded internationally which matches exactly the domestically produced one. Even then, it is often difficult to obtain reliable information on market prices.

In China, further problems arise in using official tariff rates as guides to nominal rates of protection. First, some domestic prices of traded commodities are controlled without reference to international prices and tariffs. For example, imports of grains persist even though the domestic prices at which they are sold are well below the costs of importing. The importing agencies consequently incur losses which, as noted above, are financed by transfers from the central government. The soft budget constraints of these agencies thus act as hidden import subsidies.

Even more important for China, exchange rate policy has served as an
instrument for protecting import-competing industries relative to exporters. Importers must pay the secondary market price for foreign exchange, but exporters receive the much lower official exchange rate when their foreign exchange earnings are converted to the domestic currency. In 1988 these exchange rates were approximately 5.70 and 3.72 RMB/$US, respectively. Allowing for the basic foreign exchange retention rate of 25 per cent, the rate obtained for exports becomes 4.22. A marginal unit of a commodity which sells for $100 internationally would thus cost a Chinese importer RMB 570, but a Chinese exporter would receive only RMB 372 for the same commodity. This form of exchange rate discrimination is equivalent to an implicit uniform export tax of 26 per cent.

Table 1 presents estimates of NRPs for 18 groups of traded commodities. Because of the importance of non-tariff instruments of protection in China, our calculations are based on the price comparison method.

**Effective rates of protection**

The structure of commodity protection affects individual traded goods industries, not only through its effects on their output prices, but through their input prices as well. The nominal role of protection captures the former effects but not the latter. The effective rate of protection (ERP) is intended to capture both effects.

The purpose of ERP studies is to determine the way in which the pattern of industrial outputs observed under the existing price structure differs from what would be observed under free trade. This is studied empirically by focusing not only on output but also on value added — the difference between the value of output produced by an industry and the value of intermediate goods required by an industry per unit of its output — unit value added — given the existing structure of protection and compare it with a hypothetical calculation of what unit value added would be in the absence of protection.

The central assumption of effective protection studies is that those industries for which value added has been raised proportionately the most by protection, relative to their estimated unit value added under free trade, are the industries whose outputs will have been increased proportionately.
the most by the structure of protection. This leads to the concept of the effective rate of protection:

\[ E_j = \frac{(v_j - V_j)}{V_j} \]

where

\[ v_j = p_j - \sum_{i=1}^{n} a_{ij} p_i \]

and

\[ V_j = p_j - \sum_{i=1}^{n} a_{ij} p_i \]

In this notation

- \( E_j \) = the effective rate of protection of industry \( j \),
- \( v_j \) = observed unit value added of industry \( j \),
- \( V_j \) = estimated unit value added of industry \( j \) under free trade,
- \( p_j \) = the observed price per unit of commodity \( j \),
- \( a_{ij} \) = the amount of intermediate input \( i \) required to produce one unit of commodity \( j \),
- \( p_i \) = the observed price of intermediate input \( i \), and
- \( P_j \) and \( P_i \) = the estimated free trade prices of output \( j \) and intermediate input \( i \), respectively.

In this formulation we have assumed for simplicity that each industry produces a single output. This assumption is easily relaxed. We have also assumed that the unit requirements of intermediate inputs, \( a_{ij} \), are the same with and without protection.

An analytical problem in effective protection studies involves the treatment of non-traded intermediate inputs. It is obvious that the value of these inputs is not a part of value added, since value added is thought of as the contribution of the primary factors used by an industry to the value of an industry's output. To calculate this, the value of all intermediate goods used must be subtracted from the value of output produced. Calculations of ERP require estimates of value added at (observed) producer prices and at (hypothetical) free trade prices. The problem with non-traded intermediate goods is how their prices at free trade are to be estimated.
The solution known as the Corden method deals with the problem of non-tradables by redefining the concept of value added. It decomposes the non-tradable inputs used by an industry into their traded input components, their non-traded input components and their primary factor components. The non-traded input components are then further decomposed in a similar way. By tracing through the input-output table in this way, the non-tradable inputs used by an industry are eventually split into just two categories: their traded inputs used directly and indirectly, and their primary factory inputs, used directly and indirectly. The value of the former is included in the value of all the intermediate inputs subtracted from the value of output in calculating value added. This new measure of value added, which we will call net value added is the one used in calculating ERPs. It is the method used in calculating value added both with protection and under free trade. Table 1 presents estimates of effective rates of protection based on the 1981 input-output table updated to 1988 relative prices and the ratio of international to domestic prices implied by the NRP estimates in Table 1.

Negative effective protection is indicated in most sectors. This reflects the suppression of traded goods prices in China resulting from the overvalued exchange rate and made possible by the system of foreign exchange controls. Despite the controls, in the base period for these calculations, 1988, China had a substantial current account deficit. For resource allocation purposes, it is important to focus upon relative, rather than the absolute, values of ERPs. Sectors producing primary goods have the lowest ERPs. Examples are crops (sector 1), animal husbandry (3), coal (6), and petroleum mining (7), and some manufacturing sectors using primary goods intensively, such as metallurgy (5), petroleum refining (6), wood (13), food processing (14) and paper (17). A comparison between the effective and nominal rates of protection shows that the former exhibits a more cascading structure than the latter. This pattern discriminates against the primary sectors and induces resources to move towards manufacturing.

A comparison of the results for nominal and effective rates of protection reveals a significant difference in agricultural protection rates. The crops sector (1) receives a slightly negative nominal rate of protection but a substantially negative effective rate - the lowest in the economy. Animal husbandry (3) receives a negative nominal rate of protection but its effective rate is roughly zero. Clearly, nominal rates of protection are a poor guide to effective rates in this instance. The difference lies in the types of intermediate inputs used by the two sectors.
In the crops sector, inputs of 'chemicals' dominate. These are predominantly chemical fertilisers and other agricultural chemicals. The chemicals sector receives one of the highest nominal rates of protection in the economy. The dominant input into 'animal husbandry' production is crops, used as animal feeds. Crops receive a much lower nominal rate of protection than chemicals. The ranking of effective rates is the reverse of the ranking of nominal rates. The main point is that the crops sector is more directly and more severely disadvantaged by the protection of China's manufacturing industries than animal husbandry.

In summary, the results confirm that the effect of China's protection policies has been a pattern of price distortions and resulting allocational inefficiencies typical of those observed in developing countries pursuing important-substitution-oriented development strategies. It is found, first, that the structure of nominal protection exhibits a cascading structure, from high rates on more sophisticated manufactured goods to low rates on primary and semi-processed goods. Second, the structure of effective protection differs from that of nominal protection in a way that accentuates the discrimination against primary sectors and in favour of manufacturing sectors. Overall, the primary sectors are taxed to support the development of manufacturing.

MODELLING THE EFFECTS OF CHANGES IN CHINA'S PROTECTION POLICIES

A complete analysis of the effects of trade distortions on the Chinese economy requires the use of a disaggregated model of the Chinese economy. The effects of the exchange rate system are inherently general equilibrium in nature. All of the key aggregates in the system are affected by exchange rates and any satisfactory model must take into account these interactions.

One means of overcoming this problem is to develop a computable general equilibrium (CGE) model of the Chinese economy. Dervis, de Melo and Robinson (1981) have demonstrated the feasibility of using such a model to analyse foreign exchange shortages while Kis, Robinson and Tyson (1986) have applied models of this type to post-reform socialist economies. The technology for constructing such models has improved substantially with the development of specialised programmes such as GEMPACK (Codsi and Pearson 1989), making it possible to focus on the economic rather than the computational issues.
Two recent World Bank papers (1985a, 1985b) provide consistent input-output tables on an SNA basis and estimates of many of the relevant parameters (e.g. income elasticities) needed to construct a model of the ORANI type (Dixon, Parmenter, Sutton and Vincent (1982). Data shortcomings pertinent to this analysis are the lack of distinction between domestic and imported intermediates in the intermediate use matrix and the high degree of aggregation of the agricultural sector (into crops and animal husbandry) and the textiles and clothing sector (one industry). The somewhat dated nature of the latest available database is also of some concern given the dramatic changes in the structure of the Chinese economy in recent years. More fundamentally, the database is based largely on official prices, rather than the free-market prices which are relevant for resource allocation at the margin.

In developing a model of the Chinese economy, a number of adaptations of the techniques used in modelling other developing countries (Robinson 1989) were required. The more important of these adaptations were:

- adapting the input-output and price data to reflect secondary-market rather than official prices for material inputs;
- modelling the effects of the foreign exchange retention scheme; and
- updating the database to reflect changes in the composition of trade (Reynolds 1989).

Given the evolving policy changes in the Chinese economy associated with rapid economic growth, any modelling exercise can lead, at best, to a highly stylised representation of the economy. Despite this constraint, modelling can provide many useful insights. It provides an explicit framework for analysis, frequently leading to the discovery of important, but otherwise overlooked, casual linkages.

**Broad features of the model**

Like most models of the ORANI type (Dixon et al. 1982, Vincent 1985, Dee 1989), this model focuses on the real side of the economy, with particular emphasis on the response of the economy to trade policy changes.

The behavioural assumptions of the model involve cost minimisation by producers and utility maximisation by households, and the assumption that there is sufficient competition for unit profits (at market prices) to be driven to zero. The crucial assumption is that economic agents respond to marginal
market prices for inputs and outputs, rather than official prices. Official prices are thus irrelevant to the behaviour of the model. Although it is recognised that the income redistribution induced by divergences between official and market prices may have an impact on demand behaviour, this second round effect seems likely to have a relatively minor impact on the results and hence has not been incorporated in the model.

While agents are assumed to respond in a manner consistent with neoclassical theory to the market prices which they experience, these market prices are affected by distortions such as overvaluation of the official exchange rate, the foreign exchange retention system and import tariffs and licensing, all of which can be incorporated in the model.

To facilitate solution by Johansen's method, the model is linearised in percentage changes, with domestic and imported products treated as imperfect substitutes. A standard simplifying feature of CGE models adopted in this model is a two-level representation of technology in which intermediate inputs and a composite primary factor input are demanded in fixed proportions to output levels which, in the presence of any fixed factor, require substitution between factors. In general, this substitution is represented using constant elasticity of substitution (CES) technology.

For many goods, there are marked differences between the product produced for the export market and that produced for the domestic market: both in the product's physical characteristics and in its less tangible marketing requirements. To capture these differences, it is assumed that products sold on the domestic market are differentiated from those sold on the export market. These differences are represented using constant elasticity of transformation (CET) functional form.

The model is short-run in character, with capital assumed to be fixed in each sector. It would be possible to build a longer-run version of the model in which the capital stocks in each industry were endogenous, although investment behaviour in China seems likely to be difficult to model adequately. In the absence of a well-developed theory of investment for China, investment in each sector has been specified as simply changing in line with total real absorption. As is common in short-run models, investment does not add to the effective capital stock. The underlying time period is assumed to be sufficiently long for new equipment and machinery to be produced, but not brought into production.
Given the complexities of the government revenue and expenditure system in China (Blejer and Szapary 1989), an explicit set of fiscal accounts was not incorporated in the model. Implicitly it is assumed that the authorities make whatever adjustments to fiscal policies are needed to keep real absorption at an exogenously determined level. Similarly, monetary policy is assumed to be able to control the money supply. Accordingly, a skeletal monetary sector is incorporated to allow determination of the aggregate price level as a numeraire.

Data and structure

The initial source of data for the model was the World Bank (1985a) table for 1981, the latest currently available. This table has the advantage of having been prepared using the SNA conventions, rather than the material product system (MPS) used in Chinese input-output tables. Some use was made of the Chinese input-output tables for 1981 (State Planning Commission/State Statistical Bureau 1987) and other sources where needed. Details of the construction of the complete data set are given in Thompson (1990).

In the development of standard CGE models, it is assumed that the economy is in equilibrium in the benchmark year. Clearly, the conventional approach or assuming that the value shares in the model were in equilibrium would not be appropriate since the flows in the input-output table are valued at official prices rather than the market prices required for the analysis. To make the model operational, it was assumed that the (largely) planned system operating in 1981 resulted in the same set of quantity variables as would have resulted from a market system in equilibrium. Some support for this (admittedly strong) assumption is provided by Anderson's (1989) conclusion that the pattern of development in the Chinese economy since 1949 has been consistent with the predictions of Western economic theory. Under this assumption, a data set corresponding to a market equilibrium could then be obtained by adjusting the prices. These price adjustments were made with a set of relativities between official and free-market prices collected in 1988 when a fairly well-developed set of secondary markets was operating.

Personal communication, Peng Zhaoyang, University of Adelaide.
The price adjustment process changed the gross output value of all industries. Since dual-tier pricing is not generally used in the labour market these price changes were assumed to cause changes in profits. This assumption seems reasonable in the light of the widely held proposition that the official pricing system leads to major distortions in the relative profitability of different industries in China (e.g. Chen 1988). The resulting estimates of factor intensities appear to be more consistent with expectations, and with the range of estimates observed in market economies, than the set of estimates obtained in the non-adjusted table.

The modified input-output table on which the model is based can be obtained from the authors. It contains 27 sectors: the 23 sectors presented in the original World Bank table, with textiles and clothing split into separate sectors, and additional production sectors identified for each of the fibre inputs to the textile sector.

Separating out the sectors not explicitly identified in the original table (e.g. textiles, apparel, wool, cotton and chemical fibres) necessitated the use of information from a wide range of sources as detailed by Thompson (1990). Following standard practice in CGE modelling, the elasticity parameters used in the study were largely obtained by surveying the econometric estimates obtained in countries for which empirical estimates are available.

The set of equations making up the model are divided into 17 blocks explaining final demands for goods, investment, external trade, the input sector market clearing identities, and accounting identities. Details on the structure of these equations can be obtained from the authors.

ESTIMATING THE EFFECTS OF TRADE DISTORTIONS

The two major sets of trade policy distortions in China—exchange rate overvaluation and trade restrictions — are each considered in this section. The exchange rate overvaluation is considered first, and then the effects of a range of protection policies on the agricultural sector are examined.

Effects of exchange rate overvaluation

The policy of maintaining an overvalued exchange rate taxes both imports and exports. The overvaluation of the official exchange rate directly reduces the returns to exporters. By constraining the available supply of foreign
exchange in the economy, it leads to a rise in the secondary market price of foreign exchange, and hence in the price (at the margin) of foreign exchange. The rise in the price of importables can be expected to raise the price of nontraded goods through substitution effects in both production and consumption. However, the artificial price depressing effects on the prices of exportables will tend to depress the prices of nontraded goods. Thus, the overall effects on the prices of nontraded goods, and hence their demand for resources, will be ambiguous.

The effects of overvaluation of the official exchange rate on production and trade have been examined by performing an experiment in which the official exchange rate was devalued by ten per cent from a base value of 3.72 Yuan/US dollar. This experiment results in an appreciation of the secondary market exchange rate of 6.6 per cent. Given the secondary market exchange rate of 5.7 Yuan used in forming the relative prices used in the model, this implies that a total devaluation of 27 per cent would have been sufficient to remove the direct exchange rate overvaluation. The implications of this policy change for the volume of production, imports and exports for each traded good sector have been presented in Table 2. As might have been expected given the discussion in the previous paragraph, the changes in output of the lightly traded service sectors in the model were small and have not been reported.

The effects of the exchange rate distortion on a particular industry depend primarily upon whether that industry is a net importer or a net exporter. The model results presented in Table 2 are consistent with the general expectation that devaluation of the official exchange rate would stimulate the export oriented sectors. The export oriented animal husbandry sector experiences an increase in output while the other (import competing) agricultural industries in the model experience a decline in output. The increase in output from the animal husbandry sector is small relative to that in industries such as textiles and clothing which are strongly oriented towards the export market.

The crops sector in the model experiences a small decline in output following the devaluation. This is clearly because the sector was a small net importer and the decline in the price of import-competing output outweighed the increase in the prices received from exported output. Even though the livestock sector expands its output and hence increases its demand for crop output as feedstuff, the net effect is a decline in output from the crops sector. Output declines more substantially in the wool and
cotton industries which were import-competing despite the fact that the derived demand for their outputs from the textile sector increased.

The devaluation causes trade volumes to increase significantly in virtually all industries. This beneficial effect arises because the devaluation increases the availability of foreign exchange by stimulating exports and hence lowers the price of foreign exchange on the secondary markets. An important feature of the results is an increase in intra-industry trade, with both imports and exports increasing at the same time.

Effects of removing trade distortions

The measures of trade distortions presented in Table 1 were used to measure the effects of trade distortions (quotas, tariffs, subsidies etc) in addition to the effects of exchange rate protection. Because of the wide number of possible trade distortion instruments available, and the preliminary nature of the analysis, it was decided to focus on the crops sector and on some of the key policy variables likely to influence the crops sector. The results of these experiments for the removal of distortions affecting the crops and animal husbandry sectors within agriculture and the important chemicals sector from industry are presented in Table 3.

The information presented in Table 3 shows the estimated effects of removing trade distortions in three industries. The first row shows the effects on crop outputs, exports and imports of the removal of the implicit seven percent tax on the crops sector. The price of crop outputs rises and the quantity supplied responds positively. Exports of crops rise both because of the supply response and because of domestic demand declines, and imports of crops fall for the same reasons. The second row shows the changes in output, exports and imports of crops when the implicit (54 percent) tax on the animal husbandry sector is removed. Output of crops rises, in response to the increased demand for crops as inputs into livestock production. Exports of crops fall, because of the increased domestic demand for crops in the livestock sector, and imports of crops rise for the same reason.

The third row of Table 3 shows the effects on the crops sector of removal of the implicit subsidy to the chemicals industry — a net import commodity which is the most significant material input into crops production. The removal of the protection of chemicals causes output of crops to rise, exports to rise and imports to fall. This pattern of events mirrors our
discussion of effective protection of chemicals protection has significant effects on the crops sector, but they are outweighed by the effects of removal of the implicit tax on the crops sector itself.

Finally, by comparing Table 2 and 3 we compare the effects on the crops sector of exchange rate liberalisation (Table 2) and trade liberalisation (Table 3). Because a 27 per cent devaluation is required to eliminate the gap between the official and secondary exchange rates incorporated in the model, the results in Table 2 should be multiplied by 2.7 to facilitate comparison with Table 3. Clearly, the effects of exchange rate liberalisation dominate. The effects on Chinese agriculture of discriminatory exchange rate policy far exceed the combined effects of all other forms of protection.
REFERENCES


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Chinese Trade and Exchange Rate Policies


### Table 1. China: nominal and effective rates of protection, 1988

<table>
<thead>
<tr>
<th>No.</th>
<th>Industry</th>
<th>Nominal rate of protection (%)</th>
<th>Effective rate of protection (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Crops</td>
<td>-7</td>
<td>-553</td>
</tr>
<tr>
<td>2</td>
<td>Cotton</td>
<td>-24</td>
<td>-126</td>
</tr>
<tr>
<td>3</td>
<td>Animal husbandry</td>
<td>-54</td>
<td>-3</td>
</tr>
<tr>
<td>4</td>
<td>Wool</td>
<td>-21</td>
<td>-30</td>
</tr>
<tr>
<td>5</td>
<td>Metallurgy</td>
<td>-38</td>
<td>-34</td>
</tr>
<tr>
<td>6</td>
<td>Coal</td>
<td>-67</td>
<td>-32</td>
</tr>
<tr>
<td>7</td>
<td>Petroleum — mining</td>
<td>12</td>
<td>-56</td>
</tr>
<tr>
<td>8</td>
<td>Petroleum — refining</td>
<td>25</td>
<td>19</td>
</tr>
<tr>
<td>9</td>
<td>Chemicals</td>
<td>12</td>
<td>-76</td>
</tr>
<tr>
<td>10</td>
<td>Chemical fibre</td>
<td>-21</td>
<td>-29</td>
</tr>
<tr>
<td>11</td>
<td>Machinery</td>
<td>-24</td>
<td>-58</td>
</tr>
<tr>
<td>12</td>
<td>Building materials</td>
<td>-49</td>
<td>-51</td>
</tr>
<tr>
<td>13</td>
<td>Wood</td>
<td>160</td>
<td>-60</td>
</tr>
<tr>
<td>14</td>
<td>Food processing</td>
<td>-10</td>
<td>-4</td>
</tr>
<tr>
<td>15</td>
<td>Textiles</td>
<td>-64</td>
<td>-31</td>
</tr>
<tr>
<td>16</td>
<td>Apparel</td>
<td>-64</td>
<td>-71</td>
</tr>
<tr>
<td>17</td>
<td>Paper</td>
<td>-36</td>
<td>-59</td>
</tr>
<tr>
<td>18</td>
<td>Miscellaneous manufacturing</td>
<td>73</td>
<td>-59</td>
</tr>
</tbody>
</table>
Table 2. Effects of a ten per cent devaluation of the official exchange rate on industry outputs and trade (percentage changes).

<table>
<thead>
<tr>
<th>Industry</th>
<th>Production</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crops</td>
<td>-0.10</td>
<td>12.7</td>
<td>14.2</td>
</tr>
<tr>
<td>Cotton</td>
<td>-1.79</td>
<td>8.1</td>
<td>18.3</td>
</tr>
<tr>
<td>An.Husbandry</td>
<td>0.27</td>
<td>13.2</td>
<td>14.0</td>
</tr>
<tr>
<td>Wool</td>
<td>-3.24</td>
<td>8.1</td>
<td>15.1</td>
</tr>
<tr>
<td>Metallurgy</td>
<td>-0.13</td>
<td>10.5</td>
<td>16.8</td>
</tr>
<tr>
<td>Electricity</td>
<td>-0.03</td>
<td>15.8</td>
<td>9.5</td>
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<tr>
<td>Coal</td>
<td>0.21</td>
<td>13.6</td>
<td>13.2</td>
</tr>
<tr>
<td>Petroleum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Mining</td>
<td>0.04</td>
<td>21.4</td>
<td>0.2</td>
</tr>
<tr>
<td>- Refining</td>
<td>0.01</td>
<td>20.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Chemicals</td>
<td>-0.04</td>
<td>11.5</td>
<td>15.1</td>
</tr>
<tr>
<td>Chemical fibres</td>
<td>-0.42</td>
<td>5.8</td>
<td>25.6</td>
</tr>
<tr>
<td>Machinery</td>
<td>-0.07</td>
<td>10.9</td>
<td>16.3</td>
</tr>
<tr>
<td>Building Matls</td>
<td>0.01</td>
<td>13.9</td>
<td>12.9</td>
</tr>
<tr>
<td>Wood</td>
<td>-0.05</td>
<td>10.2</td>
<td>16.6</td>
</tr>
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<td>Food Proc.</td>
<td>0.03</td>
<td>12.9</td>
<td>13.8</td>
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<td>14.6</td>
<td>11.6</td>
</tr>
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<td>1.04</td>
<td>13.4</td>
<td>12.9</td>
</tr>
<tr>
<td>Paper</td>
<td>-0.01</td>
<td>12.1</td>
<td>15.2</td>
</tr>
<tr>
<td>Misc.Mfg.</td>
<td>0.86</td>
<td>12.9</td>
<td>12.3</td>
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</table>
Table 3. Effects of removing trade distortions on the production and trade of crop commodities

<table>
<thead>
<tr>
<th>Industry</th>
<th>NRP</th>
<th>Impact of Liberalisation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Prodn.</td>
</tr>
<tr>
<td>Crops</td>
<td>- 7</td>
<td>0.03</td>
</tr>
<tr>
<td>Animal Husb.</td>
<td>-54</td>
<td>0.01</td>
</tr>
<tr>
<td>Chemicals</td>
<td>12</td>
<td>0.01</td>
</tr>
</tbody>
</table>
INTRODUCTION

Trade liberalisation policy was officially imposed in Taiwan in October 1987 primarily in response to pressure from the Sino-American trade surplus. In January 1988, specific policies for the poultry sector were announced. Since then an important issue for policy makers has been the economic implications of policy changes on the structure of the chicken industry as well as on the entire agricultural sector.

This paper intends to assess the impacts of trade liberalisation policies on the development of the poultry industry in Taiwan. Some of the policy implications with special reference to the Sino-American trade negotiations are also discussed, followed by practical recommendations that could help the industry to better adjust to the new environment.

This paper uses an econometric model of the Taiwanese poultry sector to estimate the relevant supply responses and the market demands for chicken products at both the retail and the farm levels. The impacts of changes in chicken prices due to imports are used to estimate the benefits and costs of trade policy change. Details of the econometric model used here can be found in Lee (1989).

MARKET POTENTIALS FOR CHICKEN PRODUCTS

By simulating the Taiwanese poultry sector model, the impacts on the demand and supply of poultry are derived. Tables 1 and 2 summarise the
simulation results. Table 1 shows that chicken prices at the farm level can vary between $1.20 to $6.80 per head with price elasticities of supply varying from 2.14 to 6.27. The estimated supply of chicken ranges between 579 thousand head and 689 million head.

Table 2 reports chicken prices at the retail level. They range between $4.27 and $9.91 per head with associated price elasticities of supply ranging from 3.1 to 22.2. The estimated supplies of chicken range between 617 thousand head and 686 million head.

Assuming a price elasticity of demand for chicken products of -0.93, the estimated number of chickens demanded are in the range of 140 million to 307 million head. This study has also estimated that the price elasticities of demand for chicken at the farm level ranges between -0.26 and -0.64. The associated quantity demanded is similar to that above.

From Table 3, it can be seen that the equilibrium market price varies between $4.23 per head at the farm level, and $7.30 per head at the retail level. The market equilibrium quantity is 186 thousand head. The above results indicate that the marketing bill for chicken products accounts for 42 percent of the retail price, and that the producer's share is 58 percent.

Based on the estimates of price elasticities of demand and supply at both the farm and retail levels, it can be deduced that the supply curves in both markets are more elastic than the demand curves. This finding indicates that chicken product prices in the domestic markets will vary in an oscillating pattern if trade liberalisation policy allows imports of chicken into Taiwan.

The findings also suggest that domestic producers are more vulnerable to world market fluctuations. This fact should draw the government's attention in the process of policy formulation.

**IMPORT POTENTIALS OF CHICKEN PRODUCTS AND FEEDGRAINS**

Having estimated the market supply and demand, Table 3 reports the estimates of import demand for chicken products and feedgrains. The results show that when the retail market price of chicken is at $7.30, there is an excess demand for chicken. It is estimated that imports of 103
thousand head of chicken valued at $751 thousand will be required at this price.

When the price is lowered by 10 percent the excess demand for imports increases to 92.7 million head valued at $620 million (Table 3).

This study also estimated the cross-price elasticities of feedgrains with respect to chicken price. These range between 3.45 and 7.17. The corresponding derived demands for feedgrains are calculated to lie between 1367 tonnes and 8.4 million tonnes. We observe that Taiwan will start to import chicken at prices below $7.29.

This empirical result suggests that there exists a positive relation between chicken product prices, quantity demand of feedgrain and the total expenditure on feedgrain. This implies that increases in the imports of chicken, will adversely affect the imports of feedgrain.

Based on the 1988 official statistics of the Council of Agriculture, the total import of feedgrain was 5 million tonnes, accounting for about 74 percent of the total quantity of feedgrains demanded in the domestic market. Given that chicken production accounts for about 73 percent of total poultry production, it is calculated that the total quantity of feedgrain demanded for poultry production is 2.5 million tonnes, representing about 37 percent of the total quantity of feedgrain used in Taiwan.

Table 4 reports the increase in chicken imports and the decrease in the import demand for feedgrains at various domestic retail prices for chicken. For example, at a retail price of 7.30, the derived demand for feedgrain imports is equal to 1 million tonnes, valued at $391 million. In this case, the import of chicken will result in foreign exchange savings of $390 million. If the retail price drops to $4.27, the total import of feedgrains drops to 1020 tonnes for a total value of $398,000. In this case the foreign exchange savings from the imports of chicken amounts to $1,038 million.

**ASSESSMENT OF TRADE LIBERALISATION**

Assuming that increased imports of chicken represent a cost and decreased feedgrain imports represent a benefit, the impacts of trade liberalisation policy on Taiwan's chicken sector can be assessed.
The simulated results indicate that if the retail price of chicken is lowered by 5 percent due to imports as a result of trade liberalisation the import demand for feedgrains decreases to 193 thousand tonnes. This represents a decrease of $75 million in the value of feedgrain imports. The economic impacts of trade liberalisation are measured as the net change in foreign exchange savings of $158 million.

If the retail price of chicken decreases by 10 percent, i.e. the domestic retail price drops to $6.69, then imports of chicken increase to 63 million head valued at $439 million. The resulting decrease in the import demand for feedgrain is 359 thousand tonnes, valued at $140 million. In this case the net economic impact of trade liberalisation is a decrease in the foreign exchange saving to $299 million.

Hence, it is clear that the lower the price of chicken, the bigger the savings of foreign exchange in terms of lower demand for feedgrains.

The above findings have two implications. Firstly, domestic producers of chicken suffer more and the total revenue of chicken producers is highly vulnerable. Secondly, if feedgrain import is also under free trade arrangement in the domestic market, then the decreases in the imports of feedgrains from the United States is likely to produce an adverse impact on US feedgrain producers.

In summary, this study shows that the increased revenue from US chicken exports to Taiwan is completely offset by revenue losses from lower exports of US feedgrains. This finding can serve as further evidence for bargaining in the Sino-American trade negotiation.

CONCLUSION

Trade liberalisation seems to be an inevitable outcome given the current debate within the GATT. Taiwan has been on the track of trade liberalisation since 1987, and has in the process faced experienced pressures mostly as a result of structural change in the economy.

The agricultural sector in Taiwan has also been the most adversely affected sector as a result of trade reform. In this respect the government needs to give special consideration to the agricultural sector. It is clear that the repositioning of the agricultural sector and its policies have become the
most urgent issues in meeting the external challenges for trade reform.

Historically, the annual arrangement for feedgrain purchase has been institutionalised in order to control Taiwan’s trade surplus. The result has been an increase in the agricultural trade deficit. If the government is to effectively care for the future development of the agricultural sector, then action must be taken to ensure that imports of chicken would not be necessarily associated with the annual procurement of imported feedgrains.

Our results show that under free trade the exports of chicken from the US will be completely offset by decreases in feedgrain imports from the US. Taiwan should try to have this important point recognised in the trade negotiation in order to effectively reduce the external pressures for trade liberalisation.
REFERENCE

Lee, Shung-Cheng, 'Trade Liberalization in Chicken Products and its Impacts on Development of the Chicken-Raising Industry in Taiwan', Research Project Paper No.77-7.1, Department of Agricultural Economics, National Taiwan University, August 1989.
Table 1. Simulated Estimates of Supply and Demand for Chicken at Farm Level in Taiwan, 1988

<table>
<thead>
<tr>
<th>Change in Domestic Chicken price</th>
<th>Supply at Farm Level</th>
<th>Demand at Farm Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price Elasticity</td>
<td>Price Elasticity</td>
</tr>
<tr>
<td></td>
<td>($000 hd)</td>
<td>($000 hd)</td>
</tr>
<tr>
<td>70%</td>
<td>6.84 2.14</td>
<td>689,270 -0.64</td>
</tr>
<tr>
<td>50%</td>
<td>6.03 2.46</td>
<td>517,670 -0.61</td>
</tr>
<tr>
<td>30%</td>
<td>5.23 2.81</td>
<td>355,980 -0.58</td>
</tr>
<tr>
<td>10%</td>
<td>4.42 3.22</td>
<td>216,097 -0.54</td>
</tr>
<tr>
<td>*</td>
<td>4.22 3.33</td>
<td>185,963 -0.53</td>
</tr>
<tr>
<td>5%</td>
<td>4.22 3.33</td>
<td>185,977 -0.53</td>
</tr>
<tr>
<td>1%</td>
<td>4.06 3.43</td>
<td>163,280 -0.53</td>
</tr>
<tr>
<td>**</td>
<td>4.02 3.45</td>
<td>157,860 -0.52</td>
</tr>
<tr>
<td>-1%</td>
<td>3.98 3.48</td>
<td>152,533 -0.52</td>
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<tr>
<td>-5%</td>
<td>3.82 3.58</td>
<td>132,170 -0.51</td>
</tr>
<tr>
<td>-10</td>
<td>3.62 3.71</td>
<td>108,898 -0.50</td>
</tr>
<tr>
<td>-30%</td>
<td>2.81 4.30</td>
<td>40,657 -0.44</td>
</tr>
<tr>
<td>-50%</td>
<td>2.01 5.09</td>
<td>8,825 -0.36</td>
</tr>
<tr>
<td>-70%</td>
<td>1.20 6.27</td>
<td>579 -0.26</td>
</tr>
</tbody>
</table>

* the price level is the simulated market equilibrium price level
** the price level is the average price level of our survey
### Table 2. Simulated Estimates of Supply and Demand at Retail Level in Taiwan, 1988

<table>
<thead>
<tr>
<th>Change in Domestic Chicken Price</th>
<th>Supply at Retail Market</th>
<th>Demand at Retail Market</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chicken Price Level ($)</td>
<td>Price Elasticity of Supply</td>
</tr>
<tr>
<td>70%</td>
<td>9.91</td>
<td>3.10</td>
</tr>
<tr>
<td>50%</td>
<td>9.10</td>
<td>3.71</td>
</tr>
<tr>
<td>30%</td>
<td>8.30</td>
<td>4.47</td>
</tr>
<tr>
<td>10%</td>
<td>7.49</td>
<td>5.46</td>
</tr>
<tr>
<td>*</td>
<td>7.29</td>
<td>5.76</td>
</tr>
<tr>
<td>5%</td>
<td>7.29</td>
<td>5.76</td>
</tr>
<tr>
<td>1%</td>
<td>7.13</td>
<td>6.02</td>
</tr>
<tr>
<td>**</td>
<td>7.09</td>
<td>6.09</td>
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<td>-1%</td>
<td>7.05</td>
<td>6.16</td>
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<td>-5%</td>
<td>6.89</td>
<td>6.45</td>
</tr>
<tr>
<td>-10%</td>
<td>6.69</td>
<td>6.85</td>
</tr>
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<td>-50%</td>
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<tr>
<td>-70%</td>
<td>4.27</td>
<td>22.20</td>
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</table>

* the price level is the simulated market equilibrium price level

** the price level is the average level of our survey
Table 3. Impacts of Free Trade on the Domestic Chicken Sector in Taiwan, 1988

<table>
<thead>
<tr>
<th>Changes in Domestic Chicken Price</th>
<th>Farm Sector</th>
<th>Retail Sector</th>
<th>Trade Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chicken Price Level ($)</td>
<td>Quantity Supplied (000 hd)</td>
<td>Producer Total Revenue (000 $)</td>
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<td>70%</td>
<td>6.84</td>
<td>689,270</td>
<td>4,717,257</td>
</tr>
<tr>
<td>50%</td>
<td>6.03</td>
<td>517,670</td>
<td>3,126,129</td>
</tr>
<tr>
<td>30%</td>
<td>5.23</td>
<td>355,980</td>
<td>1,863,007</td>
</tr>
<tr>
<td>10%</td>
<td>4.42</td>
<td>216,097</td>
<td>956,977</td>
</tr>
<tr>
<td>*</td>
<td>4.22</td>
<td>185,963</td>
<td>786,194</td>
</tr>
<tr>
<td>5%</td>
<td>4.22</td>
<td>185,874</td>
<td>785,675</td>
</tr>
<tr>
<td>**</td>
<td>4.02</td>
<td>157,860</td>
<td>635,507</td>
</tr>
<tr>
<td>-5%</td>
<td>3.82</td>
<td>132,170</td>
<td>505,499</td>
</tr>
<tr>
<td>-10%</td>
<td>3.62</td>
<td>108,898</td>
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<tr>
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<td>2.81</td>
<td>40,657</td>
<td>114,574</td>
</tr>
<tr>
<td>-50%</td>
<td>2.01</td>
<td>8,825</td>
<td>17,765</td>
</tr>
<tr>
<td>-70%</td>
<td>1.20</td>
<td>579</td>
<td>699</td>
</tr>
</tbody>
</table>

* the price level is the simulated market equilibrium price level  
** the price level is the average price level of our survey  
  the positives in the last two columns stand for export quantity,  
  and the negative stand for import quantity.  

Source: This table is computed from Tables 1 and 2.
Table 4. Estimates of Total Domestic Demand and Import Demand for Feedgrains and Impacts on the Net Changes in Total Foreign Exchange in Taiwan, 1988

<table>
<thead>
<tr>
<th>Change in Domestic Chicken Price</th>
<th>Retail Market Chicken Price ($)</th>
<th>Farm Market Chicken Price ($)</th>
<th>Export/Import of Chicken Products (000 hd)</th>
<th>Export/Import Value of Chicken Products (000 $)</th>
<th>Total Quantity of Feedgrain Import (000 tonnes)</th>
<th>Total Expenditure on Imported Feedgrains (000 $)</th>
<th>Net Change in Foreign Exchange (000 $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>9.91</td>
<td>6.84</td>
<td>549,610</td>
<td>5,447,692</td>
<td>6,340</td>
<td>2,476,362</td>
<td>-2,971,330</td>
</tr>
<tr>
<td>50%</td>
<td>9.10</td>
<td>6.03</td>
<td>366,511</td>
<td>3,337,647</td>
<td>4,116</td>
<td>1,607,826</td>
<td>-1,729,820</td>
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<tr>
<td>30%</td>
<td>8.30</td>
<td>5.23</td>
<td>191,166</td>
<td>1,586,972</td>
<td>2,412</td>
<td>942,078</td>
<td>-644,894</td>
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<tr>
<td>10%</td>
<td>7.49</td>
<td>4.42</td>
<td>34,793</td>
<td>260,814</td>
<td>1,223</td>
<td>478,062</td>
<td>217,248</td>
</tr>
<tr>
<td>5%</td>
<td>7.29</td>
<td>4.22</td>
<td>-103</td>
<td>-751</td>
<td>1,003</td>
<td>391,720</td>
<td>390,969</td>
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<tr>
<td>0%</td>
<td>7.09</td>
<td>4.02</td>
<td>-33,048</td>
<td>-234,437</td>
<td>810</td>
<td>316,357</td>
<td>81,919</td>
</tr>
<tr>
<td>-5%</td>
<td>6.89</td>
<td>3.82</td>
<td>-63,948</td>
<td>-440,749</td>
<td>643</td>
<td>251,390</td>
<td>-189,359</td>
</tr>
<tr>
<td>-10%</td>
<td>6.69</td>
<td>3.62</td>
<td>-92,733</td>
<td>-620,491</td>
<td>502</td>
<td>196,165</td>
<td>-424,326</td>
</tr>
<tr>
<td>-30%</td>
<td>5.88</td>
<td>2.81</td>
<td>-186,679</td>
<td>-1,098,821</td>
<td>146</td>
<td>57,399</td>
<td>-1,041,423</td>
</tr>
<tr>
<td>-50%</td>
<td>5.08</td>
<td>2.01</td>
<td>-252,098</td>
<td>-1,280,852</td>
<td>23</td>
<td>9,192</td>
<td>-1,271,659</td>
</tr>
<tr>
<td>-70%</td>
<td>4.27</td>
<td>1.20</td>
<td>-306,176</td>
<td>-1,309,138</td>
<td>1</td>
<td>399</td>
<td>-1,308,739</td>
</tr>
</tbody>
</table>
CHAPTER 8

ECONOMIC LIBERALISATION AND AGRICULTURAL POLICY ADJUSTMENT IN INDONESIA

Faisal Kasrano and Achmad Suryana*

INTRODUCTION

During the last twenty years, dynamic changes have been taking place in the Indonesian rural economy and agriculture. Structural transformation of the rural economy is indicated by changes in the share of agriculture in GDP and employment. In 1971 the share of agriculture in those macro variables were 66.3% and 44.0%, while in 1987 it dropped to 55.0% and 23.4%, respectively.

In the late 1960s the country's rural development was characterised by rapid growth in food (rice) production, triggered by the use of modern high-yielding varieties combined with an intensive use of inputs. Since the mid-1970s, as a result of extensive development of transportation infrastructure, rural areas have ceased to be isolated. This development has brought about major impacts on the economic structure of rural areas. Most important has been the increased accessibility of rural areas to outside regions. This has stimulated two-way physical interactions and the flow of information among regions. In addition, the market mechanism has worked more effectively.

During the 1980s, in line with global efforts to reform trade, the government of Indonesia (GOI) undertook deregulatory economic reforms. The main goal of the reform was to strengthen the country's economy and to sustain growth at a reasonable rate. There are some indications that the reforms have brought positive changes to the economy.

The reforms will, of course, affect agricultural trade and comparative advantage. Thus, it will also influence the degree of achievement of agricultural development objectives. This paper discusses economic reform

* Director Bureau of Planning, and Head of Policy Analysis Division, Bureau of Planning, Ministry of Agriculture, Indonesia.
in Indonesia, its impacts on agricultural sectors, and examines agricultural policy adjustment alternatives to respond to anticipated structural changes in the country’s economy.

**ECONOMIC LIBERALISATION**

Structural changes are taking place in the Indonesian economy. The role of agriculture has declined in relative terms, and the country’s economy is approaching a more balanced structure between agriculture and industry (including services). Significant deregulation policies have been introduced since 1983. The aim of the deregulation policies, as intended by the GIO, is not to fully liberalise the country’s economy. Rather, they are meant to reduce barriers to the community's participation in the economic development process, to lower the cost of production activities, and to increase economic efficiency and product competitiveness, without neglecting important social objectives (Hadi, 1989).

For a detailed analyses of deregulation policy packages, see Gaol and Salam (1989), Simandjuntak (1989), Booth (1988), Mochtar et al. (1988) and Pangestu (1987). The first deregulation policy was launched in June 1983 to liberalise the monetary sector, especially the banking sector. The credit ceiling was lifted and interest rates were freed. Trade deregulation began in the middle of 1985 with the issuance of President Instruction (lnpres) No. 4/1985. The main objective of this policy was to increase efficiency and competitiveness of export commodities in international markets. Export and import procedures were simplified and the flow of export and import goods and documents were smoothed. The policy also involved privatisation of some activities related to exports and imports (e.g. customs, surveying).

The deregulation process continued with the issuance of the May 1986 Policy Package. This policy was designed to promote private sector participation in non-oil exports, and to attract foreign as well as domestic investments. The May 1986 package relaxed some import restrictions to enable producer-exporters to obtain inputs at international prices (Hill, 1987). This deregulation was followed by another Policy Package in October 1986 which removed or reduced tariffs on imported raw materials, designed a new protection (by tariffs) of domestic industry, and created incentives for foreign investment. The October 1986 package relaxed the imports of 321 items which were previously imported under the approved importer
licencing systems. The other part of the package dealt with import duties on 306 items, about half of which involved increases in tariffs to offset any fall in protection from the removal or relaxation of licences (Pangestu, 1987).

During 1987 the government issued three policy packages. The January 1987 Policy Package was designed to simplify import procedures and to eliminate or reduce tariffs on four industrial sub-sectors, namely textile, steel, machinery/electricity, and automotive industries. The processing of industrial licences was simplified in June 1987. A most significant deregulation policy was issued in December 1987. This included liberalisation of imports and exports by simplifying export procedures and tariff reductions for a large number of goods. In brief, the December 1987 package was designed to tackle problems of export incentives, import monopolies, the need to attract foreign investment, and tourist promotion (Booth, 1988).

The October 1988 Policy Package was an attack on the financial system. This package removed most of the restrictions on entry to the banking sector (Simandjuntak 1989). Among other things, this policy was aimed at mobilising domestic funds, promoting non-oil exports, increasing the efficiency of banking and financial institutions, increasing control of monetary policy implementation, and creating a suitable climate for the development of capital markets. In the following month another policy package was announced, which focused on shipping and trade. This package was also directed at strengthening earlier efforts to increase national economic efficiency.

The latest of the series of deregulation packages was issued in January 1990. The Ministry of Finance and The Central Bank (Bank Indonesia) announced a set of new policy measures as part of the continuing efforts to strengthen the financial system and to reduce distortions in the country’s economy. This policy addressed the problems of liquidity credits and interest rates.

The above series of deregulation policies issued by the government is an indication that the government is seriously trying to restructure the economy. The deregulation policy aims at a more balanced economic structure through the development of non-oil exports and the manufacturing sector as well as conformation with GATT agreements.
The total value of exports in the first nine months of 1988 was 16.9% higher than that in the same period of 1987. The growth in the same period one year earlier (from 1986 to 1987) was 31.8%. The increase in export values in 1987 was due to a number of factors, namely the September 1986 devaluation, the increase in international prices of some commodities, and the deregulation policy packages. But the share of each factor in the growth in export values is not known. Booth (1988), however, suggests that the devaluation might have been a decisive factor. Contrary to Booth, Simangjuntak (1989) and Mochtar (1988) explicitly argued that the deregulation packages were the most important factor for the increase in export values. Simandjuntak (1989) further explained that the increase in merchandise imports was a reflection of investment growth on export-oriented industry. The share of investment to the total approved foreign investment rose from 40% in 1987 to 64% in 1988. The share was higher in the case of domestic investment, which rose from 54% to 74%.

The value of agricultural product exports in the January-September 1988 period was 13.9% higher than that in the same period of 1987. Growth in exports of agriculture-based industrial products was much higher. Among others, the growth of export values of processed rubber was 40.1%, vegetable oil was 143.5%, processed food was 36.4% (Table 1). This indicates that the deregulation packages do have a positive impact on the promotion of agricultural exports and the agricultural sector as a whole.

AGRICULTURAL TRADE AND COMPARATIVE ADVANTAGE
Structure of Agricultural Exports

In nominal term, export values of agricultural products have increased significantly since 1982. The share of agriculture in total export earnings rose from only 7.2% in 1982 to 18.9% in 1988. However, the share of agriculture in non-oil exports in the last three years fell from 41.6% in 1986 to 34.2% in 1987 and 31.2% in 1988.

This decreasing trend in agricultural exports reflects the higher rate of growth of non-oil exports compared to that of agriculture. In 1988, for example, the value of non-oil exports grew at a rate of 39.2%, but the value of agricultural exports rose only 13.9%. By definition, commodities that are grouped into agricultural products consist mainly of primary goods or unprocessed products. Meanwhile, agricultural-processed products such as processed rubber, processed food, and vegetable oil are categorised as
industrial products. As mentioned earlier, the growth rate of exports of these products was high.

Estate crops are dominant in agricultural exports. Up to the mid-1980s, around 85% of agricultural export values was from these crops. Since 1984 the share has gradually declined, and in 1988 it was reduced to 75.9%. The export value of fishery products grew at a higher rate. In the 1970s the share of this sub sector in agricultural exports was less than 9%, but rose to an average of 11% during 1980-1985, and has increased further to 19.8% in 1988. The other two sub sectors, namely food crops and livestock, in terms of their share to total agricultural exports, had a stable performance. The share of food crop and livestock exports during the 1975-1988 period were 3 to 4% and 1 to 2%, respectively.

At present the country is a net exporter of estate crop products and a net importer of food items. Traditionally, Indonesia has a large share in international markets for rubber, palm oil, tea, coffee, tobacco, and cassava and recently has been experiencing a high growth rate of cacao exports (Table 2). On the other hand, the country is a growing importer of soybean, wheat and corn (Table 3). A noticeable change occurred in the mid-1980s when Indonesia shifted from being the world's largest rice importer to being self-sufficient in the country's main staple food.

Cassava products are the major food crop exported. Skins have been the major livestock product exported and shrimps was the dominant category in fishery exports but its share has gradually declined. In estate crop exports, rubber, coffee, tea and palm oil were the dominant products. During the last 15 years the shares of those main products in total export values of agriculture were not significantly changed, even though new export commodities have been developed in fisheries and estate crop products.

Comparative Advantage

There is no doubt that Indonesia has comparative advantage in production and export of estate crop products, especially of tropical commodities. Resource endowments, including a relatively abundant labour supply, and long historical experience in estate practices are factors which support the advantage of the country in the estate crop sub-sector. In addition, the strong commitment of the government on rehabilitation and new planting expansion have further promoted the development of this sector.
The food crop sector follows a different path of development. Rice has been the major concern of the government for many years. The aim has been the achievement of self sufficiency. As a consequence, resource allocation is biased toward efforts to increase rice production, while other food crops have not received similar attention. Nonetheless, Indonesia has an economic comparative advantage for major food crops, as indicated by two studies done by Rosegrant et al. (1987) and Kasryno et al. (1989), based on estimation of domestic resource costs.

Since Indonesia is a large country and its agro-ecological system varies greatly among regions, both studies have suggested the existence of different comparative advantages for food crop export promotion among regions. Both studies have divided the country into seven almost similar regions, namely West Java, Central Java, East Java, Sumatera, Bali and Nusa Tenggara, Kalimantan, and Sulawesi (in Rosegrant) and South Sulawesi (in Kasryno).

Results of both studies (as summarised in Table 4) have indicated that: (1) Indonesia has a comparative advantage in export production of rice, corn, soybeans and dried cassava; (2) all parts of the country have comparative advantage in exporting cassava; (3) some regions have comparative advantage in rice, corn and soybeans. The country has no comparative advantage in exporting sugar. Based on Kasryno's study, West Java and East Java have no comparative advantage in exporting corn and soybeans, while results of Rosegrant's analysis indicates that only West Java province has no comparative advantage in these two commodities.

Kasryno's study also presents domestic resource cost ratios for livestock products. Chicken meat, swine meat and beef were reported to be economically efficient with potential to be exported. On the other hand chicken egg and milk are economically inefficient as export products (Table 5).

In brief, Indonesia has comparative advantage in export promotion of agricultural products, namely estate crops, food crops and livestock products.

**Support Programmes**

The GATT contracting parties generally recognise that if substantial progress is to be made in improving international trade in agriculture, the
wide range of support programmes that protect agriculture in each country must be subject to negotiation. Because of the varied and complex types of policies used by countries, many GATT proposals suggest the use of an aggregate measure of support (AMS) which can capture the effects of the wide variety of policies in a single yardstick or measurement. One of the AMS's that has gained popular acceptance is the Producer Subsidy Equivalent, called PSE (Magiera, 1989). The PSE is defined as the income that would be necessary to compensate farmers for the removal of all government policies. The PSE is normally expressed as total government transfers as a percentage of the value of farm output (USDA 1989 and Magiera 1989).

In calculating PSE's, total government transfers usually include those that are specifically targeted to agriculture. Such policies include market price policies, income support, input subsidies, marketing subsidies and long term structural policies (Schwartz, Magiera and Mervene 1988).

Magiera (1989) has calculated the PSE for Indonesian agriculture for the 1982-86 period to be 24.4%. Compared to the PSE's of other countries as estimated by USDA (1989) for the same period (Skully in Magiera, 1989), Indonesia's PSE is lower than those in many developed countries (United States 24.6%, Canada 31.0%, EC-10 35.4% and Japan 71.7%). On the other side, Indonesia's PSE is higher than that of Argentina (22.1%), Brazil (9.2%), and India (-17.8%). Actually this direct comparison is not really valid, since the basket of commodities included in the calculation was not the same. However, this rough comparison shows that the magnitude of protection administered by the GOI is still much lower than in some other (mainly developed) countries.

Indonesia's PSE for corn and sugar for the period 1982-1986 were lower than those for the United States (Table 6). In fact, Indonesia's PSE for corn is negative, indicating negative support. PSE for soybean and sugar is high as these two commodities are highly protected as a consequence of the policy of self-sufficiency in food items. In contrast, the support is low for cassava, which is a major food export commodity, as well as for corn which is exported intermittently.

Support for rice is relatively high, namely 21.7%, and this support accounts for 64.7% of the aggregate PSE. This is understandable since rice is the most important commodity in the country, economically as well as politically.
Although Indonesia has implemented a number of economic reforms since 1983, production and trade in the major agricultural commodities remain highly regulated. Current policies to gradually reduce subsidies on fertiliser, interest rates and irrigation have all led to a reduction in the support for agriculture production. Subsidies on pesticides have already been lifted. The fertiliser subsidy is gradually being reduced.

Reforms and deregulation of agricultural trade have taken place and will continue to in the future. Non-tariff barriers for some agricultural commodities will gradually be replaced by tariffs and some of the tariffs will also be reduced. However, trade for strategically important agricultural commodities such as rice, sugar, soybean and milk will remain regulated. The objective of this trade regulation is to stabilise the domestic market for both producers and consumers.

The government also controls the allocation of vegetable oils between domestic and export markets, imposes tariffs on crude vegetable oil imports, and controls the domestic price of CPO. These policies have negative impacts on farmers' income, consumer welfare, as well as trade in palm oil (Madecor 1990). Vegetable oils are the only estate crops which are highly regulated by the government. The argument for this policy is that cooking oil is one of the nine essential goods for Indonesians, so that meeting the domestic needs and maintaining price stability are the major concerns of the government.

The recent financial reform (the January 1990 Policy Package) has reduced subsidies on all farmer loans. Interest rates that must be paid by farmers or smallholders are to follow prime commercial rates, which are currently 16% p.a. This reform has affected farmers' income and reduced incentives to invest in agriculture. Due to the long term nature of investment in agricultural infrastructure, especially for estate crops, livestock and fisheries, special regulations on interest rates for these investments are needed.

The above policy reforms will, of course, have an impact on the levels of production and farmers' income. To maintain the growth of production and income at reasonable rates, the subsidy reduction (or elimination) policies must be accompanied by output pricing policies based on the market mechanism, and an increase in production efficiency through the improvement of production technology.
Toward Freer Trade

AGRICULTURAL POLICY ADJUSTMENTS

During the 1990's, the role of agriculture in the Indonesian economy will remain important. As indicated in the agricultural development objectives, agriculture is expected to provide adequate foodstuffs at reasonable prices for the ever growing population, to provide employment opportunities for rural residents, and to alleviate poverty. In addition it supports the industry/manufacturing sector and generates foreign exchange earnings through the supply of raw materials. Also, it should contribute to sustainable development. These roles must be performed in a changing and more liberalised economy.

In general, economic liberalisation involves two activities. One is to convert all trade barriers into import tariffs. This step will make domestic prices more responsive to world prices. The other activity involves a reduction in support to agriculture and an elimination of any gap between domestic and world prices. This would eliminate the overcapacity that currently exists in agriculture, particularly in the industrialised countries (Magiera, 1989).

Based on several studies of agricultural reforms, Magiera (1989) concludes that the policies of agricultural support programmes of the industrialised countries have depressed world trade in many agricultural products. As a result, multilateral trade reforms by the industrialised countries would raise world prices for most agricultural products. For Indonesia, the impact of trade reform in agriculture is two-fold. First, it would provide new export markets and opportunity to expand and diversify its export markets and export commodities. Second, the country is a net importer of foodstuffs and if the increase of prices in world markets is transmitted to the domestic market, then higher food costs must be paid by domestic consumers, including a large part of the rural population. In addition, support to industry and to export development is being frustrated by the increase in prices of raw materials.

Three adjustments in agricultural policies and programmes are proposed in response to the structural change and reforms that are taking place in the economy. The first proposal is regionalisation or zoning of agricultural production based on economic comparative advantage. As discussed earlier, not all provinces or regions in the country have the same comparative advantage in a specific commodity. Production of specific agricultural products must be directed toward regions which have the highest comparative advantage. Recently, ideas have been developed to promote...
food production outside Java, mostly in Sumatera and Sulawesi, whereas estate crops production appears to be economically more feasible to be developed in Sumatera and Kalimantan, while fishery and livestock production are to be concentrated in the eastern part of Indonesia.

In fact, based on the distribution of planted-acreage and production of agricultural commodities during the last twenty years, changes in regional patterns of production have reflected comparative advantages (Kasryno 1990). The production of corn, soybean, cassava and sugar are moving from Java to Sumatera. The location of estate crop production (rubber, palm oil, coffee) has moved away from a single production centre in Sumatera to almost all provinces in Sumatera and Kalimantan. The share of Java as the main beef production centre has dropped, and the role of Nusa Tenggara and Sulawesi has become more significant. However, Java is still a dominant production region for rice. The share of Java in the country's rice production during the last twenty years remains around 61%.

The second proposal relates to the reorientation of agricultural export policies. Development of agricultural exports must be viewed not only as an effort to increase export volumes and values but also as an effort to improve other agricultural development issues. Dillon and Suryana (1989) suggested the following adjustments in agricultural export policies; (1) development of agricultural exports must be aimed at increasing their added value, and the development of post-harvest and processing technologies which are suitable to agro-industry and development in rural areas is a necessary condition; (2) development of agricultural exports must be achieved through export commodity diversification and product development must follow efficiency and comparative advantage principles; (3) development of agricultural exports must be accompanied by efforts to diversify export markets in order to reduce heavy dependency on a few markets, which also means reducing the risk from instability in export earnings; (4) development of agricultural exports must be implemented by developing products which have large backward linkages, so as to obtain large multiplier effects on agriculture production activities. In this way, agricultural export development will be able to increase farmers' incomes and employment opportunities in agricultural production activities.

The third proposal involves broadening the scope of the agricultural sector. Agriculture, seen as a production sub-sector, cannot absorb all the additional labour force in rural areas and, in fact, the proportion of employment in agriculture tends to decline in the major rice and other food
crops producing areas. The potential for rural economic development is to link the narrow definition of agriculture with other sub-sectors which are closely related to agricultural production. Thus, the agricultural sector in a broad sense includes agriculture production, processing of agricultural products, farm mechanical and chemical industries, and supporting services such as marketing and trade of agricultural inputs and outputs.

Data on labour allocation and the source of income in rural areas show that agriculture is currently an important sector in providing employment and household income. However, the importance of the agricultural production sub-sector in both employment and income was less in the relatively more developed regions (represented by Java provinces) compared to that in the less developed regions (represented by outside Java). In West Java agriculture (farming activities) provided 34.3% of employment, while in West Sumatera and South Sulawesi the percentages were 53.7 and 52.7% (Table 7). In Java less than 40% of household income was from agriculture, while in outside Java the percentage was above 50% (Table 8).

Those figures suggest that the rural economy is moving away from agriculture and toward a more diversified structure as the level of economic development increases. Thus, one may expect that with the on-going economic reforms, the structure of the rural economy will become more diversified, and that the policies and programmes on agricultural and rural development will no longer be suitable if they focus only on agricultural production.

Based on the above arguments, it is suggested that in formulating policies on employment in rural areas, focus should be given not just to employment in agricultural production, because greater opportunities lie outside the narrow range of agricultural production. As an integral part of this approach, a training programme for the rural labour force to meet the qualifications or requirements for employment outside the agricultural production sector is necessary and must be undertaken on a continuing basis.

**CONCLUSIONS AND POLICY IMPLICATIONS**

Indonesia is in the process of structural change in its economy, towards a broadening of its economic resource base and a deepening of the spectrum of economic development. This diversification process has been pursued
through greater reliance on the market mechanism. To stabilise domestic prices and to protect domestic producers and consumers of strategic (important) commodities, trade in these commodities is still regulated. However, protection of these commodities is generally lower than in most developed countries.

To induce long term investment in agriculture some incentive policies are still required. These incentives are in the form of provision of investment in infrastructure, research and extension.

To maintain comparative advantage in most agricultural commodities, substantial progress needs to be made in diversifying technological packages of agricultural commodities. Improvement in research, resource allocation and expansion of sources of funds are needed.

Structural adjustment in agriculture, which is necessary in response to changes and reforms of the national economy, includes establishment of appropriate production locations based on agro-ecological factors and comparative advantage, diversification of the agricultural sector to expand domestic and export market potentials, and integrated commodity and area developments which rely on the market mechanism and private entrepreneurship and participation.
REFERENCES


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Table 1. Selected Indicators of Export Performance: Indonesia

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Exports</td>
<td>12,261</td>
<td>14,337</td>
<td>100.0</td>
<td>16.9</td>
</tr>
<tr>
<td>Oil and gas</td>
<td>6,339</td>
<td>6,094</td>
<td>42.5</td>
<td>-3.9</td>
</tr>
<tr>
<td>Non-oil</td>
<td>5,922</td>
<td>8,243</td>
<td>57.5</td>
<td>39.2</td>
</tr>
<tr>
<td>Agricultural products</td>
<td>1,198</td>
<td>1,365</td>
<td>9.5</td>
<td>13.9</td>
</tr>
<tr>
<td>Industrial products</td>
<td>4,561</td>
<td>6,624</td>
<td>46.2</td>
<td>45.3</td>
</tr>
<tr>
<td>Wood products</td>
<td>1,656</td>
<td>2,104</td>
<td>14.7</td>
<td>27.1</td>
</tr>
<tr>
<td>Metal products</td>
<td>496</td>
<td>829</td>
<td>5.8</td>
<td>67.4</td>
</tr>
<tr>
<td>Textiles</td>
<td>706</td>
<td>1,006</td>
<td>7.0</td>
<td>42.4</td>
</tr>
<tr>
<td>Processed rubber</td>
<td>648</td>
<td>908</td>
<td>6.3</td>
<td>40.1</td>
</tr>
<tr>
<td>Processed rattan</td>
<td>103</td>
<td>73</td>
<td>0.5</td>
<td>-29.6</td>
</tr>
<tr>
<td>Vegetable oil</td>
<td>133</td>
<td>325</td>
<td>2.3</td>
<td>143.5</td>
</tr>
<tr>
<td>Furniture</td>
<td>18</td>
<td>46</td>
<td>0.3</td>
<td>155.6</td>
</tr>
<tr>
<td>Glass products</td>
<td>18</td>
<td>66</td>
<td>0.5</td>
<td>259.0</td>
</tr>
<tr>
<td>Paper</td>
<td>70</td>
<td>104</td>
<td>0.7</td>
<td>48.0</td>
</tr>
<tr>
<td>Processed food</td>
<td>69</td>
<td>94</td>
<td>0.7</td>
<td>36.4</td>
</tr>
<tr>
<td>Fertiliser</td>
<td>53</td>
<td>81</td>
<td>0.6</td>
<td>51.4</td>
</tr>
<tr>
<td>Non-oil minerals</td>
<td>159</td>
<td>244</td>
<td>1.7</td>
<td>53.6</td>
</tr>
</tbody>
</table>

### Table 2. Export volume of selected estate crops: Indonesia

<table>
<thead>
<tr>
<th>Year</th>
<th>Rubber ('000 mt)</th>
<th>Palm oil ('000 mt)</th>
<th>Coffee ('000 mt)</th>
<th>Tea ('000 mt)</th>
<th>Cocoa ('000 mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>577</td>
<td>159</td>
<td>101</td>
<td>37</td>
<td>0.1</td>
</tr>
<tr>
<td>1975</td>
<td>619</td>
<td>386</td>
<td>128</td>
<td>46</td>
<td>1.1</td>
</tr>
<tr>
<td>1980</td>
<td>956</td>
<td>502</td>
<td>239</td>
<td>74</td>
<td>4.7</td>
</tr>
<tr>
<td>1985</td>
<td>1000</td>
<td>519</td>
<td>283</td>
<td>90</td>
<td>30.2</td>
</tr>
<tr>
<td>1986</td>
<td>958</td>
<td>567</td>
<td>298</td>
<td>79</td>
<td>33.2</td>
</tr>
<tr>
<td>1987</td>
<td>1014</td>
<td>471</td>
<td>286</td>
<td>90</td>
<td>37.2</td>
</tr>
<tr>
<td>1988</td>
<td>1132</td>
<td>853</td>
<td>299</td>
<td>93</td>
<td>61.3</td>
</tr>
</tbody>
</table>

**Average Annual Growth rates, 1980-87**

<table>
<thead>
<tr>
<th>Year</th>
<th>Rubber</th>
<th>Palm oil</th>
<th>Coffee</th>
<th>Tea</th>
<th>Cocoa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-87</td>
<td>0.8%</td>
<td>-0.9%</td>
<td>2.6%</td>
<td>2.8%</td>
<td>34.4%</td>
</tr>
</tbody>
</table>

Table 3. Export and import of selected food crops: Indonesia

<table>
<thead>
<tr>
<th>Year</th>
<th>Rice ('000 mt)</th>
<th>Corn ('000 mt)</th>
<th>Soybean ('000 mt)</th>
<th>Cassava ('000 mt)</th>
<th>Sugar ('000 mt)</th>
<th>Wheat ('000 mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>(771)</td>
<td>282</td>
<td>0</td>
<td>n.a.</td>
<td>(127)</td>
<td>(624)</td>
</tr>
<tr>
<td>1975</td>
<td>(670)</td>
<td>51</td>
<td>0</td>
<td>299</td>
<td>(150)</td>
<td>(843)</td>
</tr>
<tr>
<td>1980</td>
<td>(1213)</td>
<td>(5)</td>
<td>(193)</td>
<td>386</td>
<td>(548)</td>
<td>(1281)</td>
</tr>
<tr>
<td>1985</td>
<td>0</td>
<td>(52)</td>
<td>(301)</td>
<td>543</td>
<td>(4)</td>
<td>(1511)</td>
</tr>
<tr>
<td>1986</td>
<td>0</td>
<td>(60)</td>
<td>(359)</td>
<td>428</td>
<td>(113)</td>
<td>(1626)</td>
</tr>
<tr>
<td>1987</td>
<td>0</td>
<td>220</td>
<td>(600)</td>
<td>825</td>
<td>(122)</td>
<td>(1603)</td>
</tr>
</tbody>
</table>

Source: Ministry of Agriculture and Central Bureau of Statistics.

Note: Figures in parentheses are imports.
Table 4. Indonesian Economic Comparative Advantage for Selected Exported Food Crops, as Indicated by Domestic Resource Cost Ratios, 1986.

<table>
<thead>
<tr>
<th>Commodity</th>
<th>1985(^1)</th>
<th>1986(^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>0.68 - 1.02</td>
<td>0.37 - 0.70</td>
</tr>
<tr>
<td>Corn</td>
<td>0.76 - 1.02</td>
<td>0.72 - 1.53</td>
</tr>
<tr>
<td>Soybeans</td>
<td>0.59 - 1.26</td>
<td>0.56 - 1.59</td>
</tr>
<tr>
<td>Dried cassava</td>
<td>0.38 - 0.51</td>
<td>0.26 - 0.46</td>
</tr>
<tr>
<td>Sugar</td>
<td>4.82 - 5.76</td>
<td>—</td>
</tr>
</tbody>
</table>

Source: \(^1\) Rosegrant et al., (1987)  
\(^2\) Kasryno et al., (1989)
Table 5.  **Indonesian Economic Comparative Advantage for Export Livestock Products, as Indicated by Domestic Resource Cost Ratios, 1986.**

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Region</th>
<th>Domestic Resource Cost Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken Meat</td>
<td>Lampung</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>Bogor</td>
<td>0.25</td>
</tr>
<tr>
<td>Chicken Egg</td>
<td>Lampung</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Bogor</td>
<td>1.01</td>
</tr>
<tr>
<td>Swine Meat</td>
<td>Bali</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td>Java</td>
<td>0.60</td>
</tr>
<tr>
<td>Beef</td>
<td>NTT, free grazing</td>
<td>0.29</td>
</tr>
<tr>
<td></td>
<td>West Java, fattening</td>
<td>0.55</td>
</tr>
<tr>
<td>Milk</td>
<td>Imported breed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Semarang</td>
<td>2.85</td>
</tr>
<tr>
<td></td>
<td>Boyolali</td>
<td>2.36</td>
</tr>
<tr>
<td></td>
<td>Cross breed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Semarang</td>
<td>1.67</td>
</tr>
<tr>
<td></td>
<td>Boyolali</td>
<td>1.45</td>
</tr>
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*Source: Kasrno et al. (1989)*
### Table 6. Indonesia and the United States: PSE’s by commodity: 1982-1986

<table>
<thead>
<tr>
<th></th>
<th>Indonesia¹</th>
<th>United States²</th>
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<tbody>
<tr>
<td>Aggregate</td>
<td>24.4</td>
<td>25</td>
</tr>
<tr>
<td>Rice</td>
<td>21.7</td>
<td>n.a.</td>
</tr>
<tr>
<td>Corn</td>
<td>-2.1</td>
<td>27</td>
</tr>
<tr>
<td>Soybeans</td>
<td>47.5</td>
<td>8</td>
</tr>
<tr>
<td>Cassava</td>
<td>2.9</td>
<td>n.a.</td>
</tr>
<tr>
<td>Wheat</td>
<td>n.a.</td>
<td>37</td>
</tr>
<tr>
<td>Sugar</td>
<td>62.8</td>
<td>77</td>
</tr>
</tbody>
</table>

*n.a.* = not available

**Source:** ¹ Magiera (1989)  
² USDA (1989)
### Table 7. Labour allocation by rural households: Indonesia, 1984

<table>
<thead>
<tr>
<th>Economic Sector</th>
<th>West Java (%)</th>
<th>West Sumatra (%)</th>
<th>South Sulawesi (%)</th>
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</thead>
<tbody>
<tr>
<td>Agriculture (farming)</td>
<td>34.3</td>
<td>53.7</td>
<td>52.7</td>
</tr>
<tr>
<td>Farm labour</td>
<td>25.6</td>
<td>9.3</td>
<td>9.5</td>
</tr>
<tr>
<td>Non Farm labour</td>
<td>12.4</td>
<td>11.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Industry</td>
<td>2.6</td>
<td>1.2</td>
<td>1.4</td>
</tr>
<tr>
<td>Service (trade, transport, etc.)</td>
<td>25.1</td>
<td>24.3</td>
<td>25.2</td>
</tr>
<tr>
<td>Total labour allocation (Man hour/year)</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Source: Kasryno (1988)</td>
<td></td>
<td></td>
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INTRODUCTION

It is now a well known fact that the Philippines is one among several developing economies in Asia that have attempted an import-substitution strategy for development. It has also been well documented that this strategy has failed to attain for the economy its avowed development goals. As pointed out by Bautista (1981), 'high tariff rates on finished products and low rates on intermediate inputs and capital goods that characterised the country's tariff structure have had the undesirable effect of inhibiting export growth and backward integration while promoting inefficiency in the use of domestic resources and slow growth of industrial development. In the 1970s, fiscal incentives granted by the Board of Investments under the Investment Incentives Act (RA 5186) and Export Incentives Act (RA 6135) and a more flexible exchange rate policy served to provide offsetting benefits to export-oriented firms'. Bautista, Power and Associates (1979) pointed out, however, that the past fiscal incentives were not enough to neutralise the biases in incentives created by the tariff structure.

One major specific effect of the import substitution strategy has been the biases against the agricultural sector of the economy exerted by tariff as well as non-tariff policies. Export taxes on agricultural products, which served as important sources of government revenues until the early 1980s, were clear penalties to the agricultural sector. Past exchange rate policies which overvalued the domestic currency likewise penalised the agricultural export sector, in favour of the import-substituting industrial sector (APST, 1986; Balisacan, 1989).

In a more general fashion, Medalla (1986) describes past tariff policies under the IS strategy as characterised by the progressivity of tariff rates according to the stage of processing. She notes that the 'escalation' of tariff
rates where raw materials are accorded low tariff rates, capital goods intermediate rates, and final goods (especially non-essentials) high rates, results in highly disproportionate effective protection rates (EPRs). This further results in an incentives structure which produces a biased and inefficient resource allocation. Thus, the specific effect as described above is rather inevitable. As Medalla further notes, 'the tariff on imports, in effect, imposes a general penalty (tax) on exports by defending an undervaluation of foreign exchange (over-valuation of the local currency), thereby creating an inherent bias against exports'.

A comprehensive trade liberalisation programme has been implemented in 1981 to correct the negative effects of past tariff and non-tariff policies. Several studies have been done to evaluate the effects of this programme (e.g. Bautista, 1981; Clarete, 1989; Fabella, 1989).

This short paper briefly reviews the results of these evaluations, presents an update of the tariff rate structure of the Philippines, and discusses some implications of the current tariff and non-tariff reforms for ASEAN trade. The latter is important in the face of increasing protectionism among the major importers of ASEAN products.

THE PHILIPPINE TRADE LIBERALISATION PROGRAMME

The latest trade liberalisation programme of the Philippines, which took effect in 1981, is a major attempt to correct the weakness of past liberalisation efforts. For example (see Alburo and Shepherd, 1986) the exchange decontrol programme in 1962, while liberalising commercial exchange, effectively activated a protective tariff code which somehow retained the same bias as the control era.

In general, the Philippine Trade Liberalisation Programme attempts to reduce the level and variance of tariff rates and remove non-tariff barriers to trade. The programme has thus been dichotomised into two — Tariff Reforms and Import Liberalisation. The former involved lowering of the maximum allowable tariff of 100 to 50 percent and the replacement of the seven-rate category in 1985 to a five rate category in 1988. On the other hand, the latter attempts to eliminate quantitative restrictions and other non-tariff barriers to trade. To date, there are more than 2,100 items that are liberalised.
Tables 1 to 3 show the distribution of tariff rates in the Philippines in 1980, 1985 and 1988. At a glance, the figures in the tables reflect the nature of reforms that have evolved during the Trade Liberalisation Period. First, it will be noted that in 1980, there were seven categories of rates with 10 percent and 100 percent as the lowest and highest allowable rates respectively. In 1985, this was reduced to six categories with 5 percent as the lowest and 50 percent the highest allowable rate. The number of categories was further reduced to five in 1988 and this time, the lowest rate category is 10 percent. As can be seen, the effect of the reduction in the number of rate categories was a decrease in the variability of tariff rates in the country. In 1980, the standard deviation of tariff rates was 32 percent. This decreased to 15 in 1985 and 1988.

It will also be noted that primary and semi-processed agricultural products (Section 1 to 4) suffered relatively large reductions in tariff protection. Animals and animal derivatives, for example, suffered a decline of tariff protection by about 30 percentage points between 1980 and 1985. This is equivalent to a 52 percent decline in tariff protection — one of the largest declines in protection during the period 1980-1985. Whereas in 1980, the average tariff rates of agricultural products were at least 14 percentage points higher than the overall average tariff (Table 1), this declined to about only two percentage points in 1985 (Table 2) and close to nil in 1988 (Table 3).

Finally, it will be noted that the number of tariff lines have almost doubled between 1980 and 1985, and tripled between 1980 and 1988. This is consistent with the international effort to improve the accuracy of classifying internationally traded commodities, more particularly under the Harmonised System (HS) of Commodity Classification.

Table 4 shows a listing of the Non-Tariff Measures (NTM) applied to traded commodities in the Philippines. It should be noted that out of the 222 tariff headings covered by NTMs, 70 fall under the agricultural (primary and processed) sector. The agricultural sector uses the most number of NTMs ranging from sanitary regulations to import licensing but this does not bear direct correlation to the degree of protection from foreign competition as it does not show the relative number of products actually covered. Besides,
most of these measures are really intended to prevent the entry of pests and diseases into the country.

A more appropriate measure of the extent by which NTMs protect a certain sector would be to calculate the NTM coverage ratio (Clarete, 1989). This refers to the ratio of the number of regulated products to the total number of products of a sector. This is not done here due to insufficiency of data but Clarete reports that from 1986-1988, the NTM coverage ratio for industry is higher than for agriculture. This implies that agricultural products have been liberalised much faster than the products of the industrial sector.

PHILIPPINE-ASEAN TRADE

In the face of an increasing protectionist stance of the major trading partners of developing countries like the Philippines and other ASEAN countries, looking at prospects of increasing intra-ASEAN trade would always open up comforting alternatives. Economic ministers of ASEAN have worked hard in exploiting the potential of greater intro-ASEAN trade, with the signing of the Agreement on ASEAN Preferential Trading Arrangement (PTA) in 1977 serving as a concrete evidence of this effort.

Although evaluations of the effects of PTA on intra-ASEAN trade have not shown encouraging results, the continued interest by ASEAN in pursuing the goals set out to be achieved from this agreement will in itself serve as a strong driving force for improved intra-ASEAN trade. Commodities covered under the ASEAN PTA have increased from a mere 71 in 1976 to over 12,000 in 1987. The margin of preference (MOP) accorded to each member country has also increased.

In conjunction with the trade liberalisation programmes of some countries including the Philippines, the increase in the MOP would certainly be beneficial especially if the liberalised commodities have high ASEAN import values. In this section, the new tariff structure of the Philippines will be examined in relation to the existing trade flows between the Philippines and other ASEAN countries.

It should be noted that before the Philippines embarked on its trade liberalisation programme, it had the highest average tariff rate within ASEAN. In 1978, it has an average tariff rate of 44 percent; after
Toward Freer Trade

liberalisation, its average tariff declined by a third making it the ASEAN country with the third lowest average tariff (Table 5). In fact, it will be noted that the slight decline in the ASEAN overall tariff level is mostly attributed to the decline in Philippine tariffs as most of the other countries increased their average tariff.

During the past two decades, the Philippines always had a negative trade balance with ASEAN. Trade with Singapore appeared to be most favourable particularly during the 1980s when the Philippines experienced an increasing trade surplus. On the other hand, trade with Malaysia and Indonesia (due mainly to oil imports from these countries), were most unfavourable.

During the 1980s, Philippine imports from ASEAN grew at an average rate of 6.2 percent per year compared to an average annual rate of growth in exports of 3.0 percent. This inevitably resulted in an increasing trade deficit particularly towards the latter part of the 1980s. Coincidentally, this phenomenon occurred during the trade liberalisation programme of the Philippines. It would thus be interesting to learn whether or not the existing tariff structure would have any bearing on the trade balance of the Philippines vis-a-vis the ASEAN region.

The average tariff rates on the Philippine's top ten exports to other ASEAN members is around 12 percent (9.0 percent with Philippines excluded from the averaging). This is slightly lower than the Philippines average tariff rates on its top ten imports from ASEAN (15 percent). Even the NTMs applied by other ASEAN countries on Philippine exports to ASEAN are relatively less than those that are imposed by the Philippines on the same groups of commodities. Thus it would seem that the tariff and non-tariff measures are not sufficient explanators of the observed behaviour of trade between the Philippines and other ASEAN countries.

Here lies the strength of the argument that the historically overvalued exchange rate is an important explanatory factor in the behaviour of the Philippines trade balance. Estimates show that the exchange rate has been overvalued by as much as 20 percent (Medalla, 1979), artificially cheapening imports and making Philippine exports more expensive. Real exchange rates during the past two decades, are, in fact, reportedly low (Fabella, 1989).
CONCLUDING COMMENTS

The trade liberalisation programme of the 1980s is one of the major policy reforms that the Philippines has embarked upon. It is also one of those policies which has strong and long term repercussions for the other ASEAN countries. Apart from the internal effects of the programme, (e.g. adjustments of effective protection of production activities and hence allocation of domestic resources), it likewise affects trade prospects between the Philippines and the rest of ASEAN.

While the Philippine-ASEAN trade is quite thin, representing only 5 percent of total Philippine exports and imports (Manaloto, 1990) cursory analysis of available data shows that trade has been increasing reasonably fast, particularly towards the end of the 1980s. In fact, Philippine's imports from ASEAN have grown at 6 percent per year during the ILP period of the 1980s. Although this would appear superficially unfavourable, it would bring forth long term benefits in terms of a more efficient allocation of domestic resources consistent with the country's comparative advantage.

Hopes for the trade creation effects of the ASEAN-PTA remain strong. Several loopholes and weaknesses, however, have been pointed out by ASEAN scholars. Among these are the following (Naya, 1987):

1. Tariff reductions under the PTA were negotiated on the basis of defined commodity classifications. With these fine commodity classifications, the countries would go on exchanging large lists of concessions without much effect. Many commodities had little practical value in terms of effective trade creation because of their low trade content.

2. The voluntary, product-by-product approach used in the initial period contributed to the selection of items with low trade content. Countries were willing to volunteer items that did not significantly affect domestic industries.

3. The large exclusion list constrained the expansion of intra-ASEAN trade. It was observed that there was a general tendency for the percentage of goods excluded to increase with the import value range.

4. The tariff reduction offered on the items was low to permit a significant impact on potential imports, except for items with extremely high price elasticities of import demand. However, there is no indication that items under the PTA have high price elasticities.
Furthermore, production cost in ASEAN manufacturing is often high relative to export prices of other major exporters of manufactures. Tariff preferences, therefore, have to be substantial to bring the price below the level of competing items.

5. As tariffs are reduced, NTMs tend to have an increasing effect of limiting trade expansion. In fact, it has been noted that products entitled to tariff concessions under the ASEAN PTA are also faced with NTMs that effectively nullify preferential access. Moreover, the product lines that seem to be most affected by NTMs are commodities with good prospects for expanded trade, such as food, chemicals, transport equipment, and the mechanical and electrical machinery sector.

The general reductions in the tariff rates of goods under the current trade liberalisation programme of the Philippines will serve as a complementary force to the ASEAN-PTA in improving trade with other ASEAN countries. Lower tariff rates in conjunction with increasingly higher Margin of Preference would ultimately result in a larger trade creation effect.
REFERENCES


Fabella, R. ‘The Role of the Exchange Rate Protectionism in Development Successes: Implications for the Philippines’.


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*Note:* Figures in parentheses are percentages of total number of items under each BTN section.
Table 2. Distribution of tariff rates; Selected Items and Total: 1985

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Note: Figures in parentheses are percentages of total number of items under each BTN section.
Table 3. Distribution of tariff rates; Selected Items and Total: 1988

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Source: Tariff and Customs Code of 1988

Note: Figures in parentheses are percentages of total number of items under each BTN section.
### Table 4. Philippine Non-Tariff Measures for selected Items, 1988

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<td>b)</td>
<td>SR</td>
<td>9</td>
</tr>
<tr>
<td>c)</td>
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<tr>
<td>d)</td>
<td>SR + DIL</td>
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<td>e)</td>
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<td>f)</td>
<td>QR</td>
<td>3</td>
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<td>g)</td>
<td>SR + EP</td>
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<tr>
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<td>d)</td>
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<td>8</td>
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<td>e)</td>
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<td>f)</td>
<td>ST + DIL</td>
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<td>g)</td>
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<td>f)</td>
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**Notes:**
- DIL = Discretionary Import Licensing
- QR = Quarantine Regulation
- SR = Sanitary Regulations
- EP = Export Prohibition
- IP = Import Prohibition
- PR = Phytosanitary Regulations
- EQ = Export Quota
- ST = State Trading
- DIP = Discretionary Import Prohibition

**Source:** ASEAN, 1988. Consolidated List of NTMs Maintained by ASEAN Countries.
**Table 5. Comparison of Simple Average Tariff Rates among ASEAN Countries, 1978, 1984.**

<table>
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<tr>
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<tr>
<td>Philippines</td>
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<td>Thailand</td>
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</tr>
<tr>
<td>Singapore</td>
<td>5.6</td>
<td>6.42</td>
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*Source:*  

CHAPTER 10

MANAGING THE IMPACTS OF AGRICULTURAL TRADE LIBERALISATION IN TAIWAN

Rhung-Jieh Woo* and Tsu-Tan Fu**

INTRODUCTION

To achieve greater liberalisation of trade in agriculture and bring all measures affecting imports and exports under strengthened and more effective GATT rules and disciplines is one of the ultimate objectives of the current GATT round of multilateral trade negotiations. Although there are still some disputes on several issues among different interest groups, the general directions and procedures to be followed have been agreed at the Geneva meeting held in April 1989. GATT signatories have agreed that a fair and market-oriented agricultural trading system should be established in the long run and that the reform process should focus on the reduction of trade distortions.

In response to the global liberalisation trend with respect to agricultural trade, the government in Taiwan has recognised that fundamental reforms and adjustments in agriculture must be undertaken. Various adjustments have been made to reduce import barriers as well as several agricultural products. However, the move towards free trade still involves significant changes in domestic and trade policies. Continuous adjustments toward a system with minimum distortions in production, consumption and trade of agricultural products is necessary. At the same time, a process of adjustment with minimum costs is also desirable.

The general objective of this paper is to propose practical approaches of agricultural adjustment in Taiwan which could meet the objectives of trade liberalisation while easing the transitional costs.

* Associate Professor, Department of Agricultural Economics, National Taiwan University.
** Associate Research Fellow, Institute of Economics, Academia Sinica, Taiwan.
PRODUCTION, CONSUMPTION AND TRADE: AN OVERVIEW

Since 1962, the value of agricultural production in Taiwan has been less than that of industrial production. Since the same time the rate of increase of agricultural production has been much slower than that of industrial production. In 1988, the total value of agricultural production was 161,647 million New Taiwan Dollars, about 6 per cent of the country's Net Domestic Product (NDP). However, a historical comparison shows that the value of agricultural production in 1988 is about 23 times that of 1953.

Although the share of agriculture in the NDP has declined substantially, agriculture still represents an important sector in Taiwan since agriculture occupies over two thirds of the land area in Taiwan.

Table 1 shows the production, consumption and foreign trade for major agricultural products in Taiwan in 1988. Of the seven categories listed, cereals have the largest production followed by vegetables, meats and fish. Table 1 also shows the import and export of agricultural products in Taiwan. The proportion of imports to domestic production is largest for wheat, corn, sorghum, beef, powdered milk and soybeans. Banana, pork and fish products have the largest exportproduction ratio compared to other products exported.

The self-sufficiency ratios indicate that Taiwan is self-sufficient in vegetables, fruits, pork, poultry, fish, fresh milk and sugar.

However, Taiwan imports wheat, corn, beef, powdered milk, soybeans and some rice in order to meet domestic requirements.

In addition to the principle of comparative advantage, several studies have shown that the high levels of self-sufficiency as well as the large volumes of import for selected agricultural products may be the result of domestic agricultural policies and trade policies in Taiwan. Hence, one should first investigate the characteristics of these policies and their relevance in Taiwan before developing appropriate strategies for trade liberalisation.

POLICY INSTRUMENTS FOR GOVERNMENT INTERVENTIONS

The rationale for government intervention in the agricultural sector in Taiwan include the following:
1. to stabilise the supply of agricultural commodities
2. to stabilise the market price of agricultural commodities
3. to narrow the gap between farm and non-farm income
4. to ensure food security
5. to improve farm productivity

To carry out the above goals, the government of Taiwan uses tariffs and non-tariff import regulations as well as domestic commodity programmes. The different policies are summarised in Table 2. Since Taiwan is one of the major importers of foodstuffs in Asia, tariffs and regulations for imports will be emphasised in the following discussion.

One of the purposes of using tariffs for agricultural products is to provide production incentives for domestic producers. Tariffs can also be used to counter the effects of export subsidies from other countries. In this respect import tariffs have a direct effect on stabilising the domestic market price. Import tariffs apply to most agricultural products with favoured rates to those countries having bilateral agreements with Taiwan. Seasonal tariffs are also used during harvest periods for selected fruits. In general, the nominal tariff rates on agricultural products have been reduced substantially over the last few years with further cuts predicted over the next few years.

Import regulations used in Taiwan can be classified into two categories: Import Controlled and Import Permitted. Import Controlled is carried out through a licensing procedure by the Bureau of Foreign Trade (BOFT). This regulation applies to selected agricultural products listed in Table 2. Import Permitted can be classified into four types:

1. Permitted/Free, (F) means product to be permitted free for import.
2. Permitted/Restricted Area, (RA) means products can be imported from some restricted areas or countries, including those with which Taiwan has bilateral trade agreements.
3. Permitted/License, (L) means products can be imported with a license (or agreements) from authorised government agents and the BOFT.
4. Permitted/Disease Restricted Area, (RDA) restricts (or prohibits) imports from areas or countries with cholera or other specific diseases.

'Import controlled' policies have a positive effect on the stabilisation of market supply for those products controlled. They also have an indirect effect on the moderation of market prices for those products. 'Import permitted' policies help not only stabilise prices and supplies for domestic agricultural products, but also to prevent entry of diseases from overseas.
In addition to the objectives already discussed, domestic agricultural commodity programmes are used to enhance the level of farm income, and to ensure food security for major food crops such as rice. Long-term research and extension programmes may be used for improving farm productivity. The other major agricultural policy instruments used include price support, deficiency payment, marketing order, soil conservation and rice conversion programmes. However, input subsidies, disaster payments, crop and livestock insurances and research and extension programmes are relatively insignificant in Taiwan.

**MEASURES OF GOVERNMENT INTERVENTIONS**

The information from Table 3 summarises the various policies and the commodities to which they are applied. Table 3 also shows the nominal tariff rates, the type of import regulation and commodity programmes used for the major agricultural products in Taiwan.

These products are categorised into five groups: cereals, meats, milk, tobacco and sugar, and fruits.

**Cereals**

All cereals including rice, wheat, soybeans, corn and sorghum have a low nominal import tariff rate. Imports of cereals are permitted with licensing from BOFT. Price support programmes are the major policy instrument used for cereals. The corresponding PSE’s for the 1982-1986 period for the different cereal products are relatively high, ranging from 28.1 per cent for rice to 74.3 per cent for sorghum.

Rice is the biggest food crop in Taiwan with a relatively high self-sufficiency rate and limited imports and exports. Rice has been supported via guaranteed prices and marketing quotas since 1974. While these programmes help meet the food security objectives they have also resulted in a rapid expansion of rice production in Taiwan. In an effort to reduce the resulting surpluses, the government has introduced a rice plant conversion programme as well as a soil conservation programme since 1984. Under these programmes rice farmers are paid to convert part of their paddy into non-rice crops or simply to keep their land idle.
Wheat, soybeans, corn and sorghum, have low self-sufficiency rates and imports are necessary to meet domestic requirement (Table 1). Domestic wheat production is mostly contracted with the Taiwan Tobacco and Wine Monopoly Board, an official agency with the sole right to market wheat purchased at a guaranteed contract price. Other crops are purchased at guaranteed prices by mills which receive the differences between the guaranteed price and market prices from the government.

Meats

The meat products listed in Table 3 are the major types of meat consumed in Taiwan. Beef is mostly imported while Taiwan is self sufficient in both pork and chicken. On average, meat products have higher nominal import tariff rates than cereals with chicken having the highest import tariff at 40 per cent in 1990.

The major trade regulations for meat products include the 'import permitted' policies. Beef is permitted for import ('restricted area'), whereas the import of chickens is permitted with a license issued by BOFT. Price support programmes constitute the main form of government intervention in the meat sector.

Milk

The import of fresh liquid milk is subject to import tariffs of as much as 40 per cent. The production of fresh milk is regulated through a contract system. Milk producers have production contracts with dairy companies and receive a guaranteed price. Processed milk powder however is permitted to be imported freely.

Tobacco and Sugar

Producers of tobacco and sugar have production contracts with the Bureau of Tobacco and Wine Monopoly Trading and the Taiwan Sugar Cane Company. The type of import regulations used for Tobacco are Permitted License, whereas import controlled policies are applicable to sugar and their preparations. The nominal tariff rates for tobacco and sugar are around 30 per cent for each commodity (see Table 3).
Managing Agricultural Liberalisation in Taiwan

Fruits

The nominal tariff rates for fruits range from 15 per cent to 50 per cent depending on the type of fruit. The type of import regulation and commodity programmes also depends on the specific fruit but generally include one or more of the broad policies discussed earlier (see Table 3).

ADJUSTMENTS TOWARD FREE TRADE

Although there are still several policies which interfere with agricultural production, consumption and trade in Taiwan, reforms have been implemented to reduce the tariff and non-tariff barriers as well as production subsidies in recent years.

During the past decade, import tariffs on agricultural products in Taiwan have been reduced significantly. The weighted ‘real’ tariff rate has decreased from 9.5 per cent to 5.5 per cent between 1979 and 1988. By 1993 the average ‘real’ tariff rate is expected to be roughly 3.5 per cent. A timetable for further tariff reductions on 528 items of agricultural products has been drawn up.

The government in Taiwan seems to be sincere in reducing tariff barriers. However, in order to make the adjustment process less painful, tariff reduction should be gradual as well as pre-announced so that resource reallocation could proceed more smoothly.

In Taiwan, import licenses are the major form of non-tariff import controls and apply to most agricultural products. Import licensing regulations will have to be modified to meet the new GATT disciplines. In this case too, the agricultural sector needs considerable time can get to make the adjustment less costly.

A timetable that gradually liberalises selective industries in sequence might avoid unforeseen impacts of liberalisation. ‘Tariffication’ of the existing non-tariff import barriers, as suggested by the United States, is one of the practical approaches to eliminate non-tariff trade barriers.

According to the United States Department of Agriculture (USDA), the average level of producer subsidy equivalents (PSE) in Taiwan between 1982 and 1986 was 19 per cent while the figures for the United States, the EC and Japan were 24, 35 and 72 per cent respectively. Based on this
comparison, Taiwan’s agriculture does not benefit from excessive subsidies.

All direct and indirect subsidies affecting agricultural trade are included in the current Uruguay Round of GATT negotiations. In 1987, the United States proposed the phasing out of all subsidies affecting farm trade by the year 2000. In 1988, the US presented a proposal under which some income support would be permitted under two headings (1) income transfers decoupled from production and marketing and (2) food aid programmes. In addition, there is a general view within the OECD that decoupled payments should not be included in PSEs when measuring levels of producer subsidies. In this respect, ‘decoupling’ has become a popular concept in many countries involved in agricultural trade liberalisation.

In the future, decoupled farm support could be adopted in Taiwan for the purpose of supplementary farm income. Price policies which distort production and, in turn, affect trade should be frozen and eliminated gradually.

DECOUPLING SUBSIDIES FROM PRODUCTION

The main objective of the current GATT negotiations on agriculture is to reduce import barriers and the adverse impact of subsidies on agricultural production and trade. As pointed out by Hathaway (1987), the negotiations are not concerned with the amount of income being transferred to the farm sector as long as such transfers are fully decoupled. If governments find it necessary to provide income to their farmers beyond what they receive from world market prices, governments still would be able to make income transfer payments unrelated to agricultural production.

Decoupling of income support involves providing government transfer payments to farmers independent of their current and future levels of production and commodity prices. One of the goals of decoupling is to make farmers’ planting decisions responsive to market signals while maintaining income or cushioning the expected income declines.

Proposals for the achievement of trade liberalisation which involve decoupling can be represented by a broad spectrum of possibilities. At one end of the spectrum according to Collins and Vertrees, a decoupled payment would have no short or long-term effect on production At the other end of the spectrum, a decoupled income support would not directly distort
farm price or short-run marginal return but might indirectly affect production in the medium to long term.

Realistically, it is difficult to identify transfer payments that would not affect the recipients' production decisions in some manner. For instance, the payment could be used to acquire more efficient equipment that could affect future profits. This, in turn, would affect decisions to produce and to remain in farming. Nevertheless, decoupling does represent a practical approach to support farm income and at the same time help lower the level of distortion in production.

**APPROACHES TO SMOOTH THE ADJUSTMENT PROCESS**

It is generally agreed that freer trade in the world will necessarily benefit every nation. Based on this, trade liberalisation has become very popular among many nations. However there are costs involved in implementing policies in order to achieve freer trade and these costs can be substantial. To smooth the adjustment process and minimise the resulting impacts from freer trade has become one of the major issues facing most nations concerned with freer trade.

In the case of Taiwan, undoubtedly, various degrees of damage would occur to different industries when tariffs, non-tariff barriers and production subsidies are gradually reduced. There are several approaches which might help in easing the transitional costs while at the same time maintaining farmer's welfare.

In Taiwan, long-term growth in farm income has not kept pace with income growth in the non-farm sector. Farm income support has been one of the major objectives of agricultural policies and will be continued in the future. Under a decoupled system, full-time farmers could still receive direct payments from the government if their per capita incomes fall below a minimum level without necessarily affecting their production decisions.

Transition from the present price support policies to decoupled income support policies should be gradual. In the first stage, guaranteed purchase programmes should be modified to price guarantees with deficiency payments. Next, the deficiency payments should be decreased gradually and be eliminated after certain periods of time. After then, a decoupled income support programme could be implemented.
Many other policies can supplement those that are decoupled in order to make the adjustment process smoother. For instance, the government could be more active in improving the efficiency of the domestic agricultural marketing system in order to narrow the gaps between prices paid by consumers and those received by farmers. In addition, the agricultural finance system could be improved to provide better financial services. Insurance systems for farmers, such as crop insurance, health insurance, social insurance and retirement planning, are also areas where improvement is possible.

Furthermore, efforts should be made to promote agricultural resource reallocation. Existing regulations or laws which restrict resource allocation should be modified or eliminated. At present, farm lands in Taiwan are required to be owned by farmers and be used for agricultural purposes. Many farmers, mostly part-time farmers, are not willing to sell their land even though farming is not profitable. They hold their farm land hoping that the land will be assigned to other uses someday and that land prices will increase. If effective policies could be adopted to eliminate the expectation of windfalls, many part-time farmers might release their farm lands and leave the agricultural sector. This, in turn, might help in expanding the average farm size thereby improving farm productivity.

Moreover, the government should give more attention to improving public utilities in rural areas. Medical, educational and recreational facilities are to be improved in order to provide farmers with a better environment and a standard of living comparable to that of the non-farm sector.

**CONCLUDING REMARKS**

The trend towards agricultural trade liberalisation is likely to persist in the future. Like many other economies, Taiwan is striving to follow the rules of free trade. Although much effort has been made to reduce trade distortions, there is still room for improvement. In the coming years, existing tariffs, non-tariff barriers and subsidies which distort production, consumption and trade will be gradually reduced and eventually eliminated.

When moving toward free trade, several principles are to be followed during the adjustment process. First, liberalisation should be gradual and pre-planned. Second, the urgency and the degree of liberalisation for different
commodities should depend on their characteristics. Third, measures which can increase farm income and welfare but do not distort production and trade should be adopted to smooth the process of adjustment.

In the short run, timetables for trade liberalisation should be prepared. Damage due to liberalisation should be compensated. However, the compensation should be reduced over time. In the long run, regulations on farm land should be reformed to assist resource reallocation. Farm size should be enlarged to increase farm productivity. The agricultural sector should be restructured to promote high-value, high-technique industries. Full-time farming should be encouraged and farmers should be well trained in order to increase productivity. A more efficient marketing system for agricultural products should be established. More attention should be paid to environmental protection. In addition, various welfare programmes should be implemented to improve the welfare level of farmers.

In conclusion, the process of adjustment toward free trade could be painful and costly. However, if proper approaches are implemented to achieve freer trade the welfare levels of farmers could be maintained or even improved. In this respect, the costs of adjustment might be reduced and the process of adjustment made smoother.
REFERENCES


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Source: Council of Agriculture, 1989, Taiwan Food Balance Sheet
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Source: Council of Agriculture, The Republic of China
### Table 3: Nominal Import Tariff Rates, Import Regulations and Commodity Programmes for Selected Agricultural Commodities in Taiwan, 1990

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Note: Permitted/L, Permitted/RA, permitted/ORA and permitted/F are defined in Table 2.

Source: 1. Council of Agriculture, Taiwan.
2. USDA, 1988, Agriculture in the Uruguay Round: Analyses of government support, AAD, ERS, USDA, Washington, DC.

a: cane and raw-cane sugar (25$), rock sugar (35$) cube sugar (35$)
b: maple sugar (40$)
c: grapefruit and citrus have seasonal import tariffs
PART III

Decoupling Farm Support: A Viable Option?
CHAPTER 11
DECOUPLING AGRICULTURAL PROGRAMMES:
THEIR COSTS AND BENEFITS

Stephen L. Magiera and Praveen M. Dixit*

INTRODUCTION

It is clear from the proposals that have been tables before the GATT for the Uruguay Round that the agricultural negotiations should cover only those policies that distort trade. The United States proposal (July 1987), for instance, calls for the elimination of all protection and support to agriculture which distort trade. Bona fide food aid, disaster payments, and decoupled payments would be allowed under the GATT. Other proposals, although emphasizing different solutions to world agricultural trade problems, also focus only on those policies that distort trade.

The desire to transform existing mechanisms for supporting farm income into policies that will be less trade-distorting has generated considerable interest in decoupled income support to farmers. Indeed, decoupled income support is considered by some as a possible panacea to the world agricultural trading problems. It is one means of cushioning the expected declines in farm incomes that would follow agricultural policy reform in a manner that would be acceptable to GATT contracting parties.

Over time, the term 'decoupling' has taken on several different connotations and definitions. The term has even been used in reference to any government programme which does not distort trade, including those that do not involve direct payments. For this paper, however, we limit use of the term to direct payments to farmers. If neither the implementation nor the removal of a payment has any impact on production, the payment is fully decoupled. One can also think of partially decoupled programmes in which the link between programme payments and output is partially broken.

* Economists at the Economic Research Service, US Department of Agriculture. Views expressed in this paper are those of the authors' and not necessarily those of the US Department of Agriculture.

1 Any programme which targets government payments only to the farm sector will inject liquidity into the sector and will likely have some impact on farm output even if payments are not tied to the level of output. This problem is ignored throughout the remainder of the paper.
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If decoupled payments are to be a viable alternative to existing farm programmes, they must be acceptable both internationally and domestically. While international acceptance of such a concept may be readily forthcoming because they are minimally trade-distorting, domestic endorsement could be more difficult. For a decoupled programme to be domestically viable, it must be politically acceptable, financially manageable, and administratively feasible.

Under some definitions, decoupling requires that payments be made independent of whether or not a farmer continues to produce. Such payments are politically unpopular with farmers since they resemble welfare programmes and violate the ideals of a 'fair wage for a fair day's work'. Farmers may also be suspect of any direct payment programme because the cost falls squarely on the budget. This makes the payments very transparent and vulnerable to budget cuts in the future.

The financial costs of direct payment programmes is another major source of concern regarding decoupled programmes. The primary motivating force behind some countries' participating in the current negotiations may be the high treasury costs of government programmes. A switch from price support policies to direct payment programmes transfers the costs of farm support from consumers directly to the budget, creating the potential for even larger budgetary costs. Because budgets are subject to limits via the legislative process whereas high food prices usually are not, direct payments may not be an attractive alternative domestically in these countries. This is in spite of the fact that, in either case, consumers ultimately pay — whether it be through high food prices or through high taxes.

There are also practical difficulties with designing truly decoupled programmes. The information requirements necessary for such programmes could be large, particularly if the basis for payment depends on circumstances specific to the individual farm. Similarly, the bureaucratic infrastructure necessary to collect this information and to implement the programmes may need to be expanded.

Any policy reform that includes decoupled income support to farmers can be expected to influence world agriculture substantially. Our objective in this paper is to study the economic consequences of decoupling agricultural support in industrial market economies. We examine the trade-offs between the international acceptability (i.e. the degree of trade distortion) of several types of direct payment programmes and their domestic acceptability.
(budgetary costs).

The study examines three alternative direct payment programmes. These represent only a sampling of the types of direct payment programmes that have been suggested for the Uruguay Round, and are certainly not exhaustive. Indeed, a larger array of direct payment schemes may well be advocated if the Uruguay Round results in a substantial elimination of all border measures, and direct payments are the only remaining mechanism to transfer income to farmers.

The budgetary costs of each decoupling alternative are analysed with respect to three different payment options. The payment options are designed to capture the most likely extremes in treasury costs associated with decoupling programmes that maintain overall income transfers to farmers. Payments schemes designed to meet a more limited set of policy objectives (supporting low income farmers, preserving the environment, etc.) could cost much less.

**THREE DIRECT PAYMENT SCENARIOS**

The three direct payment programmes that are examined for this study are: decoupled payments under free trade (FREETRADE); a payment entitlement guarantee scheme in which producer payments are limited to 100 per cent of base production (PEG100); and a payment entitlement guarantee scheme in which producer payments are limited to 80 per cent of base production (PEG80)².

For the FREETRADE scenario, we assume that the industrialised countries eliminate all existing government programmes that transfer income to the farm sector. Thus, all border measures and other forms of agricultural support are eliminated. At the same time, these countries compensate producers for the loss of government assistance through decoupled direct payments. The payments are independent of the level of production and the farmer's decision on whether or not to produce. They are assumed to have absolutely no impact on production, consumption or trade.

Under the payment entitlement guarantee (PEG) scenarios, the industrialised countries eliminate all border measures, but make direct payments to farmers based on the amount produced up to the pegged

² The Producer Entitlement Guarantee scheme has been proposed by Blandford, de Gorter and Harvey (1988).
quantity — 100 per cent of 1986 production of PEG100 and 80 per cent of 1986 production for PEG80. In other words, payments increase directly with the amount produced but are guaranteed only up to the pegged quantity. Production above the pegged quantity, or level eligible for support, receives no additional payments.

Under the PEG scenarios, all demand-side distortions are eliminated. Whether or not production is distorted will depend on the relationship between the pegged quantity and free trade production. The PEG payments are tied directly to the quantity produced and affect producers' marginal revenues up to the pegged quantity. If the pegged production quantity is below free trade levels, production occurs at free trade levels and the payments are substantially decoupled. If the pegged production quantity is above free trade levels, production occurs at the maximum level eligible for support and continues to be distorted.

The PEG schemes involve policies which are very similar to current US grain programmes. To implement a PEG, however, several change would be required. Policies which drive a wedge between US market prices and world prices — the export enhancement programme for example — would be eliminated. Also, US base acreage and programme yields would be frozen and subject to international rules and discipline, and the loan rate would be eliminated. As a result, farmers would no longer receive a guaranteed minimum price. We also assume that farmers would no longer be required to idle acreage in order to participate in the programmes. However, farmers will not receive additional payments if idled acreage is brought into production since payments are limited to either 100 per cent or 80 per cent of 198687 production.

The '0-92' provisions of the 1985 Food Security Act are potentially a step towards decoupling. Farmers who participate in US grain programmes and who take advantage of this provision receive deficiency payments even though they do not produce. Few farmers have taken advantage of this provision, however. By producing, they can receive both the deficiency payment and a guaranteed minimum price. Payments under '0-92' would qualify as decoupled under our FREETRADE scenario if all other aspects of US programmes were eliminated, particularly the loan rate.

Technically, demand under the PEG scenarios is slightly distorted. This is because the world price levels attained under these scenarios are not identical to those under free trade.
THE MODELING FRAMEWORK

The analysis is conducted utilising the Economic Research Service's SWOPSIM modeling framework (Roningen, 1986). SWOPSIM is a comparative static, PSE/CSE based model. The version of SWOPSIM used for this report is designed to represent world temperate and subtropical zone agricultural markets in 1986/87. Twenty-two agricultural commodities are included in the model: beef, pork, mutton, poultry and eggs, dairy including manufacturing milk, butter, cheese, and other dairy products, soybeans and soybean products, other oilseeds and oilseed products, cotton, sugar and tobacco. The world is divided into eleven regions: seven represent the industrial market economies, three characterise developing countries, and one represents the centrally planned economies. Additional details on the model can be found in Roningen and Dixit, 1989.

As with any large scale model, SWOPSIM's design reflects the question being asked. SWOPSIM was built to analyse full trade liberalisation by the industrial market economies over the medium term. It was not built to examine the budgetary details of various policy alternatives or the micro details of various programme designs. Hence, for purposes of this study, the model is used to illustrate a set of issues rather than provide precise production/budgetary estimates.

PRODUCTION IMPLICATIONS OF ALTERNATIVE SCENARIOS

The production implications of the three direct payment scenarios are presented in Table 1 and Figure 1. Agricultural production in industrial market economies (IME's) decline by 3.2 per cent under the FREETRADE scenario. Since decoupled payments by definition have no impact on production in this scenario, the production impacts are identical to those that would occur under free trade without decoupled payments. Farm income, however, would be different because countries are allowed to offset the farm income losses that would occur with the elimination of all other forms of government support.

Under PEG100, all border measures are eliminated but farmers receive direct payments which offset the loss in price supports and which are limited

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4 PSEs and CSEs refer to producer and consumer subsidy equivalents, respectively. Roningen and Dixit (1989) define the terms and discuss their use in the modelling framework.
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to 100 per cent of each country's production base. Because all border measures are removed, demand-side distortions are eliminated. Demand for agricultural products in the industrialised countries increases and world prices rise. Production, on the other hand, is no lower than the base period levels because producers continue to produce 100 per cent of their production base in order to receive government payments. In addition, efficient producers in each country who can profitably produce at the new set of higher world prices expand production. The net impact is an overall increase in production in nearly all countries.

The PEG80 scenario results in production impacts which are very similar to those under FREETRADE. Agricultural production in industrialised countries declines by 2.8 per cent, compared with 3.2 per cent under FREETRADE. This is because the 80 per cent production base is below the free trade levels of production for most commodities in nearly every country. Thus, production in most countries will occur at free trade levels. Exceptions are the highly protected producers in Japan and Other Western Europe. Agricultural production in Japan, for example, declines by 12.5 per cent under PEG80, compared with 18.4 per cent under FREETRADE.

Because highly protected countries maintain a higher level of output under PEG80 than would occur under FREETRADE, countries with relatively low levels of agricultural support produce somewhat less. In New Zealand, for example, agricultural production increases by 8.8 per cent under PEG80, compared with a 9.8 per cent increase under FREETRADE. A country with low levels of agricultural support, like New Zealand, may therefore find a PEG scheme less attractive than free trade unless pegged quantities are substantially below current production levels.

The decoupled nature of the PEG scenarios, particularly PEG100, is not readily apparent from a comparative static analysis. While PEG100 may remove none of the supply-side distortions existing in the base period, producers no longer have the incentive to expand production in order to receive additional government payments. As a result, producers will not expand production if payment levels are increased or if supply curves shift out because of technological progress. This is illustrated in Figure 2.

Assume that a country operates a simple target price scheme in which the difference between the target price (TP) and world price (WP) is made up by an open-ended deficiency payment. With supply curve S, production would be at Q in the presence of government programmes while production
would occur at $Q^*$ if no programmes existed. Now suppose that the country simply changes its legislation and limits the production level on which payments are made to 100 per cent of base period production ($Q$). Such a change has no impact on current production and thus removes none of the production distortions that currently exist. Over time, however, assume that the supply curve shifts out. At $S'$, production remains at $Q$, but the programme is less distorting than in the base period because production would occur at $Q'$ in the absence of government programmes. With the supply curve at $S'$, the programme becomes fully decoupled for all practical purposes.\textsuperscript{5} Producers respond at the margin to world prices and production increases to $Q'$. The increase in production in this situation is unrelated to the level of government payments.

**Payment Options**

Our emphasis so far has been on the production implications of the three direct payment alternatives. Whether any of these schemes would be acceptable to countries also depends on the budgetary costs of the programme. The scenarios themselves in part determine budgetary costs — whether payments are made on 80 per cent or 100 per cent of base period production for example. In addition, costs will depend on whether payments are based on some measure of income or production, and how payments vary with either.

Government budgetary outlays are evaluated for each of the three scenarios under three payment options. In selecting these options, we assume that the primary objective of governments is to continue permanent income transfers to farmers. The options differ in how these incomes transfers are measured. It should be noted that savings could be achieved if programmes were designed more efficiently and if payments are targeted to more limited segments of the farm population. These payments might be used to achieve other government policy objectives — adjustment assistance for losses in asset values due to the removal of farm programmes, preservation of the family farm, supporting small or low income farmers, and certain environmental objectives. However, the extent to which these other objectives can be met with the direct payment programmes is beyond the scope of this paper.

\textsuperscript{5} If $S'$ is the aggregate supply curve for the agricultural sector as a whole, some inefficient producers may continue to produce with a supply curve $S$. The PEG payments continue to affect these farmers' marginal production decision and thus production within the country will remain distorted.
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The three payment options are as follows. Under Option A, government transfers are fixed at the same level of transfers to producers that occurred in the base period. These transfers are calculated for each commodity and country as the per-unit PSE times the amount produced (100 per cent of 1986/87 production for FREETRADE and PEG100 and 80 per cent of 1986/87 production for PEG80). The second option, Option B, is the same as Option A except that the per-unit payment is allowed to vary with world prices. If world prices increase, the per-unit payment is allowed to vary with world prices. If world prices increase, the per-unit payment falls and vice versa. Under Option C, it is assumed that a payment scheme can be devised which just offsets any producer surplus losses that might occur under each direct payment alternative. The changes in budgetary costs from 1986/87 levels for each payment option and under each decoupling scenario are presented in tables 2, 3 and 4.

Option A: Per-Unit Payments Maintained at Original Levels

When per-unit payments are based on the original level of transfers to the farm sectors in each IME country, (option A, Table 2), government budgetary costs increase substantially from 1986/87 levels for all direct payment scenarios. This is particularly the case for Japan and the European Community (EC), for which most agricultural support is provided indirectly by consumers through high prices and is therefore off-budget.

Costs, however, differ across scenarios. Under FREETRADE and PEG100, treasury costs increase by $184 billion for all IME's because farmers receive payments on their entire production base. Under PEG80, payments are limited to only 80 per cent of the production base, and the budgetary cost increases are markedly less ($54.8 billion). Even so, PEG80 would be expensive in some countries. Budget costs increase by more than $23 billion in Japan and by nearly $30 billion in the EC over 1986/87 levels.

Option A points to one basic finding: implementation of this option involves large treasury costs independent of the decoupling alternative.

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* For all scenarios, we use the 'literal' definition of the PSE. That is, the PSE is the amount of income accruing to farmers as a result of all government programmes. In practice, the interpretation of the term 'income' varies with the programme for which the PSE is being calculated. Also, PSE's include government programmes for research and for infrastructure development, etc.

7 Producer surplus is defined as returns to fixed factors and is similar to net farm income.
chosen. The treasury outlays could be reduced by lowering the production base on which payments are made. But, for the budgetary costs to be no greater than 1986/87 levels, the pegged quantities on which payments are made would have to be considerably lower than 80 per cent of 1986/87 production.

**Option B: Per-Unit Payments Vary with World Price Changes**

Since all scenarios lead to world price increases, governments can realise considerable savings on the cost of direct payment programmes if these price increases are allowed to offset payments to farmers (option B, Table 3). For the industrialised countries as a whole, these savings could be between $45-60 billion. In moving from Option A to Option B, treasury cost increases for IME’s decline from $84.3 billion to $27.3 billion under FREETRADE, from $84.3 billion to $53.9 billion under PEG100, and from $54.8 billion to only $10.3 billion under PEG80. The budgetary cost increases differ across the scenarios for two reasons. First, the world price increases under PEG80 and FREETRADE are significantly higher than those under PEG80. Under Option B, these price increases are used to offset budgetary outlays, thus reducing the cost of PEG80 in comparison of the production base under PEG80. This further reduces the cost of PEG80 in comparison with the other scenarios.

Two inferences can be drawn concerning Option B. First, substantial cost savings might be achieved if payment rates are allowed to fluctuate with world prices. Second, countries like the European Community and Japan would still face increased budgetary outlays. For PEG80, these cost increases are $9.4 billion for the EC and $18.6 billion for Japan.

**Option C: Payments Offset Producer Surplus Losses**

Options A and B rely on gross revenues as their income measure and will usually over-compensate producers for the elimination of current farm policies. This is illustrated for option A in Figure 3. Assume that a country operates a simple target price scheme in which the difference between the target price (TP) and world price (WP) is due to some type of border measure. With supply curve S, production would be at Q' in the presence of government programmes while production would occur at Q* if no programmes existed. Under Option A, the total compensation to farmers
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for the removal of the border measure is \((TP - WP) \times Q'\), or areas \(A+B\). Additional treasury savings can be generated, however, if a payment scheme can be designed which just offset producer surplus losses — area \(A\). Table 4 presents the treasury cost changes associated with each of the scenarios for such a payment option.

Under FREETRADE, a programme that just offsets producer surplus losses would cost IME's only $13 billion more than current programmes. The treasury costs would be only slightly higher ($13.6 billion) if such a scheme was implemented for PEG80. Under PEG80, the market gains from reform are much less, producer losses are larger, and the cost of offsetting these losses are larger. The costs would be especially high for the European Community ($13.1 billion), and Japan ($19 billion).

Thus, payments which just offset the producer surplus losses resulting from trade reform would generally be cost effective for most IME's under the PEG80 and the FREETRADE decoupling schemes. The United States, in particular, would incur less treasury outlays than in 1986/87. For Japan and the European Community, on the other hand, the treasury costs would be higher than in 1986/87, independent of the scenario.

In comparison to a fully decoupled programme, a PEG80 scheme where payments just offset producer losses may be difficult to implement. Not only are payments based on net farm income rather than on a per-unit basis, but the production base on which payments are received must be fixed. It is not clear how a compensation scheme that incorporates both of these features could be implemented.

AN EVALUATION OF DECOUPLING OPTIONS

Most decoupling options will be significantly more expensive than current policies for those countries which support agriculture indirectly through high food prices. These cost increases can be reduced if countries allow the world price increases from trade reform to offset producer payments, if producer payments are limited to producer surplus losses, or if payments are limited to a small production base.

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4 Under Option B, the total compensation would be \((TP - WP^*) \times Q\) where \(WP^*\) is the new world price resulting from multilateral trade reform.
The budgetary cost increases under PEG80 with offsets for world price increases (Option B) are actually lower than those of a fully decoupled programme that just offsets producer surplus losses (Option C). Thus, payment Option B with payments limited to 80 per cent of the production base may represent a viable alternative to a programme of fully decoupled payments. Also, such a scheme may be more acceptable to farmers since production is required in order to receive payment.

Option B, in which payments vary with world prices, might be easier to design than programmes to offset producer surplus losses since many current programmes that offer significant support to the farm sector already operate with a target price. There are, however, several major problems with implementing a PEG scheme. For one, there is a direct relationship between supply-side distortions and the base on which payments are made. As the payment base declines, the payment schemes for more commodities and more countries become more decoupled and production becomes less distorted. At issue, then, is how the production base eligible for support is to be negotiated.

Our model estimates that even the 80 per cent payment base leaves some distortions on the supply side. Countries with low levels of protection, Australia and New Zealand for example, might find such distortions unacceptable. In order to remove all supply-side distortions, the payment base would have to be reduced even more and perhaps vary by country. It is unclear how such a reduction might be negotiated without definitive knowledge of the production distortions caused by policies in each country. Also, some countries might find such negotiations unacceptable since they appear to involve negotiation of production targets andor market shares. In actual fact, only the entitlement to payments would be negotiated, not actual production levels.

Rather than negotiate the base eligible for support, an alternative might be to negotiate the payment rate itself. The base eligible for support could then be fixed at 100 per cent of base period production. Lower payment rates would force some inefficient producers out of production and might

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9 An example of a programme to offset producer surplus losses from the elimination of current programmes might be a guaranteed net-farm income programme. The net-farm income guaranteed, in this case, would be that existing during the base period and could be obtained from farm income tax records. To our knowledge, no such programme exists in the industrialised countries. See Finkle and Purton (1988).

10 The payment base which would remove all supply-side distortions for every commodity/country depends among other things on supply/demand elasticities for every commodity in every country. Negotiators may not accept our model’s result that an 80 per cent payment base is close to free trade.
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lead to a more balanced reduction of support across countries. However, such an alternative might only be acceptable internationally so long as the payment rate is not negotiated to zero. Otherwise, there would be no reason for countries that currently rely on market price supports as their primary mechanism for supporting farm incomes to take on the additional step of implementing a PEG. For these countries, the PEG does not represent an alternative if they must both eliminate all border measures and reduce the PEG payment rate to zero. 11

Perhaps the most serious problem with allowing the payments to vary with world prices (Option B) under PEG80 is that the budgetary costs appear reasonable only because of the model-generated increases in world prices. The increases in prices are likely to be irrelevant if governments are required to immediately remove all border measures and implement decoupled income support.

The initial increase in cost of farm income support in the EC under Option B is $20 billion even under the assumption that payments are made only on 80 per cent of the production base. In order to make these costs more manageable, a transition period would be necessary. This would create new administrative difficulties since some countries would need to add a new policy of direct payments limited to a fixed production base while keeping their current set of policies in place during the transition. For countries which support market prices through a target system, this involves lowering that target price as border measures are eliminated while introducing a new fixed target price off which direct payments are determined.

CONCLUSIONS

Ideally, countries should pursue programmes that can meet their various agricultural policy objectives without distorting trade. Decoupling support has received considerable attention as one such programme. This paper examines three decoupling alternatives. Each involves international and domestic trade-offs. All direct payment programmes will be less attractive than border measures to some countries since they involve higher budgetary

11 As mentioned earlier, this paper focusses on programmes to permanently transfer income to farmers. Reducing the PEG payment rate to zero implies the elimination of such transfers.
costs. This is in spite of the fact that consumers ultimately pay for the programme in either case.

Budgetary costs can be significantly reduced if payment rates reflect the world price increases that are expected from trade reform, are based on producer net farm income losses, or are limited to a small production base. Fully decoupled programmes are the most acceptable internationally because they lead to undistorted trade patterns. A producer entitlement guaranteed programme with a small production base would lead to similar trade patterns and would also be more appealing to farmers since they are required to produce in order to receive payment. However, producer entitlement guarantees would involve difficult negotiations over the production base eligible for support in each country.
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Harvey, David, *Decoupling & the European Common Agricultural Policy,* Background Paper for the International Agricultural Trade Research Consortium Symposium on 'Bringing Agriculture into the GATT,' Annapolis, Maryland, August 1988.


Figure 1. Agricultural production responses in the United States, the EC and Japan under various direct payment scenarios
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Figure 2. Decoupling and Production Entitlement Guarantee (PEG) programmes
Figure 3. Compensation under producer surplus offset scheme
Table 1. Agricultural production implications of various decoupling alternatives

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Table 2. Changes in treasury costs when per-unit payments are based on original transfers (Option A)

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### Table 3. Changes in treasury costs when per-unit payments vary with world prices (Option B)

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Table 4. Changes in treasury costs when payments offset producer surplus changes (Option C)

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CHAPTER 12

PRACTICAL APPROACHES TO DECOUPLING FARMER SUPPORT: THE NEW ZEALAND EXPERIENCE

Doren Chadee*, Ronnie Horesh** and R W M Johnson**

INTRODUCTION

Government intervention in agriculture in most industrialised countries has led to substantial increases in the output of agricultural products over the last twenty years. As a result, most agricultural producers and exporters have made aggressive use of border measures and subsidies in order to cope with surplus agricultural products. By the early 1980's government expenditures on agricultural support programmes had reached unprecedented levels in most western countries. Increasing pressure on the treasuries of these countries led to a commitment on their behalf for reforming agricultural production and trade. This commitment was formalised when agriculture was explicitly included in the GATT Uruguay Round of Multilateral Trade Negotiations (MTN's) launched in 1986.

With the Uruguay Round now drawing to its end, it has become obvious that progress in world agricultural trade liberalisation has been quite modest. Part of the reason for the slow progress lies in the fact that agricultural trade liberalisation involves modifications of existing domestic policies. These policies differ widely across countries and a common measuring yardstick for the purpose of comparison has not been agreed upon yet. As such it has been extremely difficult to reach any consensus on implementing changes on a multilateral basis. Secondly, drastic changes to programmes that are designed to support and stabilise the income of farmers can be quite difficult to implement from both an economic and a political standpoint.

Unlike most other OECD countries, New Zealand has almost completed a unilateral liberalisation of its agricultural sector. In this paper, we outline the New Zealand experience at implementing these reform measures, how

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they were achieved and what the current situation is. Hopefully, the New Zealand experience will provide some guidance to others on decoupling agricultural support from production and some of the challenges that such reform represent.

Part 1 of this paper briefly overviews the concept of decoupled support. Part 2 looks at the objectives of decoupled support, and how these would condition its definition for the purposes of any agreed GATT disciplines. Some of the disadvantages of decoupled policies are discussed; the Producer Entitlement Guarantee scheme is described and the issue of whether developed and developing countries should be treated differently is briefly examined. Part 3 overviews the New Zealand experience at decoupling agricultural support followed by some concluding remarks in the last section.

DECOUPLING: AN OVERVIEW

Decoupling generally refers to any form of support to farmers where such support does not exert influence on production or factors of production. The level of output produced is independent of the amount of support delivered by a fully decoupled assistance measure. Decoupled support is consistent with market orientation in that it does not affect farmers' decisions about how much to produce. It does not interfere with trade, or in any way distort trade patterns. Its main objective is to support incomes and this it does in a more direct, and less trade-distorting way, than market price support or border protection. Decoupled support also has the advantage that it does not suppress demand for agricultural products as does market price support.

The concept of the decoupled subsidy has received a lot of attention in the GATT Uruguay Round of MTN's for agriculture and could continue to grow in importance beyond this Round. It is an agreed objective of the Round that disciplines may be agreed upon, eventually, to monitor and to gradually reduce the assistance delivered by agricultural support policies. Decoupled subsidies, however, may be exempted from some of these disciplines. In this respect, decoupled forms of assistance are likely to become a more important source of support for the agricultural sector in the future.

Before examining further the definition of decoupled assistance it is
instructive to overview briefly the current situation with respect to agricultural support in the OECD member countries and the potential economic gains from a widespread movement from coupled toward decoupled support.

Currently, market price support and deficiency payments account for nearly 75 percent of total support to farmers in the OECD countries (OECD 1989). These forms of support have led to a panoply of widely documented resource allocation distortions, losses of economic efficiency, heightened trade tensions, and domestic budgetary, environmental and food quality problems (OECD 1987, 1988 and Body 1987). The bulk of the assistance they offer goes to the larger farmers, and they also tend to destabilize world markets. The costs of coupled support then, are borne widely, and not least by the developing countries.

General economic policies in many less developed countries (LDC's) also tend to discriminate against agriculture. For instance, taxes on farm output tend to create a bias against the agriculture sector. Governments in LDC's usually attempt to offset such biases using price stabilisation policies, input subsidies and consumer subsidies (World Bank 1986). Previous studies have shown that such policies tend to be inefficient. Those LDC's which have a bias in favour of agriculture tend to use border measures to achieve this result.

The question that arises then relates to the potential benefits that a shift towards decoupled support has to offer. Recent studies indicate that developed countries would benefit significantly from such a shift. A recent OECD study has estimated that if all border measures in the six main OECD agricultural trading countries or regions (Australia, Canada, EC, Japan, New Zealand and the US) in 1986-88 were removed and the same levels of budgetary support given to farmers via direct payments, such a shift in the composition of farm support policies could yield gains to consumers equivalent to 0.8 percent of their real income (OECD 1989/90). Given that agriculture and food processing together account for only about 6 percent of total OECD output this represents a significant gain in efficiency.

Similarly, another study has estimated that if the OECD countries had cut their tariffs on agricultural commodities by 50 percent, developing countries' income would have increased by US$922 million in 1977 and their export revenues by almost US$6 billion. Total export revenue would
have risen by 11 percent; exports of low-income countries would have risen by 8.5 percent (Valdes and Zietz). Since the level of protection in the OECD countries has increased since 1977 the benefits of liberalisation would clearly be substantially greater to-day.

Further evidence of substantial gains from widespread decoupled support in LDC’s has been provided by Tyers and Anderson. This particular study has estimated that developing countries, as a group, would gain approximately US$28.2 billion if they, alone, liberalised. Their study simulated the effects of removing distortions in border prices by 16 individual and four regional groups of developing countries, and removal of overvalued exchange rates.

Clearly, significant gains are to be achieved by shifting from coupled to decoupled support for farmers. Yet, as the OECD points out in a recent report (OECD 1990), ‘In only a few [OECD] countries are there direct income measures which are generally unrelated to outputs or inputs in production’. The reasons for the slow shift from coupled to decoupled support system for agriculture are outlined below.

DEFINITION OF DECOUPLED SUPPORT

The pure decoupled subsidy would be paid to farmers in such a way that it would not exert influence on any of their decisions which affect output. There are several problems with this tentative definition. An exploration of the issues may lead to a more practical and operationally useful definition.

The first issue relates to the definition of ‘farmers’, that is, the question of who is to receive the support? One consideration is whether farmers are to be treated differently from others. If not, the issue of the definition of ‘farmer’ does not arise. But because farmers have been recipients of coupled support in the past it may be thought politically realistic to disburse decoupled assistance solely to ‘farmers’. Furthermore, farmers in the developed countries typically own too many assets to qualify for benefits under most schemes intended for the general population. A means of deciding who is a farmer for the purpose of receiving decoupled support may therefore be required.

For this purpose ‘farmers’ may be defined in terms of the time they spend
farming, or the proportion of income received from farming. In either case, would-be recipients of support would have an incentive to produce. Also, it may be undesirable for environmental and other reasons, to attempt to remove all forms of support payable to farmers in marginal areas who, in the absence of any support, would leave the land. Decoupled support would ideally be limited to those who had received coupled support in the past, or who are currently on the land, whether or not they are producing anything (though token amounts may be permitted).

Note though that being on the land, or having received coupled support in the past, are necessary but need not be sufficient qualifications for the receipt of decoupled support: receipt can also be made contingent on other factors such as the undertaking of conservation or land improvement projects.

Another problem with the definition given above concerns 'decisions affecting output': the amount of each farmer's decoupled subsidy should be totally independent of the volume of output that he or she produces (or intends to produce) currently and in the future. This last qualification is important: a subsidy could still be decoupled if it were paid to farmers on the basis of past levels of production as long as it does not influence future levels of production. However, a policy cannot be classified as decoupled if benefits to farmers are correlated with the volume of inputs purchased after the implementation of the policy.

A subsidy, therefore, could be defined as 'decoupled' provided it is payable in an amount independent of inputs and outputs produced in the season for which the subsidy is paid, or in future seasons. This independence is to be over the entire range of each farmer's potential production, from zero output upwards. If a subsidy is to be considered decoupled the farmer will receive the same amount of subsidy regardless of whether he or she decides to produce nothing (or a token amount) or whether he or she decides to produce something. 'Output' here means agricultural output, and should also be taken to refer to any product, marketable or not, which can be used as an input into the production of any agricultural product.

The implications of this definition are examined further by considering four policy examples.

(1) Exit Grants: These are paid to farmers on condition that they retire permanently from farming. These grants would be the ideal example of
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the decoupled subsidy.

(2) **Research and Development (R+D):** Bona fide research programmes undoubtedly affect farm production in various ways. One of the most common impact of R&D on farm firms is that R&D effectively reduces the firm's average cost of production. But the relationship between expenditure on R+D and supply is difficult to identify, not only for analysts, but for farmers themselves. It is this latter point that is important: as far as farmers are concerned they will appear to receive the same (zero) benefit from most bona fide R+D expenditure if they produce nothing as they would if they produce something. This is a result of the national nature of most R+D programmes. Benefits are widely distributed over many farmers, and take a long time to materialise.

Nevertheless policies which are designed both to support farmers in ways which will induce a supply response and to appear to be R+D programmes are not beyond the scope of the imagination. Programmes which are sub-national in scope would be particularly suspect. Decoupled R+D programmes would be precompetitive and the information they generate would be publicly available. It is important that R+D, and other categories of expenditure which are agreed in the GATT to be 'decoupled', be monitored, and disciplines imposed on policies which contravene the spirit of any liberalisation agreement.

(3) **Canada's Western Grains Stabilisation Act** guarantees the aggregate net cash flow of Canadian cereal farmers at a level not below the previous five-year average. Participation is voluntary and the Federal Government contributes two-thirds of its costs. Because this subsidy is paid not according to price, but according to the difference between actual income and the average of past years' levels it has been argued that it is a decoupled subsidy.

This argument is difficult to sustain. In any one season the government's contribution to the farmer is equivalent to two-thirds of the difference between the farm's cash flow and the five-year average. The five-year average cash flow will be closely correlated to the volume of production in the previous five years. By expanding production farmers can expect to raise their five-year average cash flow, and so increase the government subsidy when a shortfall occurs.

The WGS programme appears to contravene the objective of the Cairns
Group for agriculture in that market signals to farmers are significantly attenuated by the government subsidy element of the scheme. It is also clear that this programme falls outside the boundaries of the definition of 'decoupled' offered above: in seasons where their cash flow falls short of the five-year average farmers would receive more of the government subsidy component by producing more output.

(4) *Supply Management:* While the definition of decoupled support given above serves to exclude price support policies from the 'decoupled' category of policy, we need also to consider the joint interaction of price supports with supply controls. Where supply controls are binding an increase in the support price will not induce an increase in supply, if, as is usually the case, the support price is already higher than the world price. Should such product price increases be classified as decoupled subsidies and therefore be exempt from any agreed disciplines on non-decoupled policies? Product price increases of this nature would entrench existing production patterns in subsidising countries and so inhibit movement toward market-oriented trade. Furthermore, the impacts on farmers' decision making for instance, would distort production and potentially trade. In this respect, supply management programmes could be classified as coupled. Genuinely decoupled policies would not encourage farmers to maintain production at levels beyond those evoked by world market prices. If governments require the effect on incomes that price increases under supply controls would generate they could simply transfer funds to farmers at levels proportional to their past output.

The above examples make it clear that support policies form a continuum between the totally coupled and the totally decoupled. The suggested definition given above draws the line at the point where the connection between increased output and increased subsidy becomes obvious to farmers and so critically influences their production decisions. However it may be more helpful, in advancing the GATT negotiations, to list a narrow category of policies which would be classified as decoupled, as well as to attempt to define, as far as possible, criteria for such policies. Equally pertinent is the fact that this point on the continuum is fairly easy to identify. But it is not a foolproof definition. Ideally therefore all subsidies should be subject to agreed reduction disciplines with ad hoc exclusions granted only for genuinely decoupled support, of which bona fide research and development would be an example.
PRACTICAL ASPECTS OF DECOUPLING

Although it is widely accepted that by decoupling farm programmes from production there are substantial gains to be made both in developed and in less developed countries, many countries prefer to bear the costs associated with coupled policies by maintaining the status quo. Then the question arises as to why most countries do not move towards decoupled support policies. From governments' point of view decoupled payments have several practical disadvantages. These include:

* inter-sectoral distribution - in contrast to market price support, decoupled payments are made in the form of explicit payments to farmers, however defined. Their visibility, and the fact that they will be made independently of output, would raise questions about why people in other sectors, who might be equally poor, receive no such payments.

* eligibility within the farm sector - again, in contrast to market price support policies, decoupled payments require governments to specify the recipients. Criteria could be based on income levels, or on a requirement to fulfil certain conditions; for example, land conservation or withdrawal of resources from farm production. In any case, invidious choices as to which farmers shall receive the payments will have to be taken.

* new policies, and associated administrative procedures, would have to be set up to replace established ones.

* the supply response to new support systems may be uncertain.

It may be politically unrealistic to expect widespread adoption of schemes which were not correlated at all with the income lost from the removal, or progressive reductions, of coupled support. With schemes which replace coupled support by assistance decoupled from past as well as future production there would be enormous practical problems in determining by how much to compensate farmers. This problem is more complicated than determining the revenue lost from the removal of coupled support. It requires assessment of the alternative uses of farm resources. Some, mostly the bigger farms, would have more opportunities for diversification out of agriculture than others. Invidious judgements would have to be made about the extent of the alternative income sources enjoyed by (or open to) the farm household, though there could, as in New Zealand, be ex-post assessment of actual taxable income levels.
If new forms of income support were not intended to compensate, to some degree, for the amount by which a farmer’s coupled assistance is reduced, then those farmers currently producing large volumes, and so benefiting most from price supports, would become big losers. These farmers would exert strong political opposition to any agreement which targeted subsidies correlated to past production. Opposition would be further incited by the highly visible nature of income support schemes not linked to production. Several direct income payment schemes that have been proposed within the OECD are likely to be afflicted by problems of this sort.

**PRODUCTION ENTITLEMENT GUARANTEE - PEG**

The Production Entitlement Guarantee (IATRC 1988) may provide a useful halfway house between existing price support schemes and fully decoupled support. The PEG is a preset limit on the quantity of production eligible to receive support payments. This limit must be less than would be produced in response to market prices. For large farms only a fraction of their total production would receive support payments and the rest would be sold at the open market price. Most of the production of small farms, though, would be supported. Under this scheme, therefore, only the quantity of output over the level which is eligible for support would be determined by its value on the world market. The PEG scheme has several merits (Blandford and de Gorter):

* the total amount of price support can be reduced
* support can be more readily and flexibly targeted at smaller farms
* farmers are encouraged to produce efficiently, both within and beyond their guaranteed level
* as a commodity-based policy it may be politically more acceptable than fully decoupled lump sum type payments.

PEGs can be made tradeable. Because they would be more valuable to low-cost rather than high-cost farmers the latter could be bought out by their more efficient neighbours. New entrants to farming would either have to purchase (or lease) PEGs or produce all their output at world market prices, without PEG payments. If PEGs were not tradeable they would freeze existing production patterns and so lead to efficiency losses.

The first step under a PEG scheme would be to phase out all border and domestic support measures. Then the support price, and the quantity of
production entitled to receive support would be fixed. The initial issue of PEGs would be at the discretion of national governments but may need to be negotiated internationally to conform with any GATT disciplines on internal support.

However, in keeping with its status somewhere between fully coupled and decoupled assistance, the PEG scheme has several problems, common to both coupled and decoupled support:

* PEGs would not be immune from political pressure to increase assistance if there were a downturn in market prices.
* PEGs, in common with decoupled support generally, involve highly visible budgetary support, rather than by taxing consumers.
* PEGs for each farm would have to be decided involving complex and invidious decisions.
* Output up to the PEG would have to be monitored for each farm, so that it can receive the assisted price.

SPECIAL AND DIFFERENTIAL TREATMENT (S+D) FOR LESS DEVELOPED COUNTRIES

Another important issue related to decoupled support involves the treatment of less developed countries. Two questions are relevant here:

(1) how are bona fide infrastructural programmes which benefit the agriculture sector to be regarded? and
(2) should such programmes be treated differently for LDC's?

There is likely to be a difference of degree of concentration between infrastructural programmes and R+D expenditure. The latter is generally channelled through national research and extension agencies. The relationship between R+D expenditure and production incentives is thereby obscured, in the eyes of the farmer.

With infrastructural programmes, however, the relationship is not necessarily so obscure. Many infrastructural programmes would channel benefits to only small groups of producers, according to their location, range of products or other distinguishing characteristic. Particularly questionable would be sub-national expenditure targeted at inputs whose use is closely correlated with output. Nevertheless we should not want to
see bona fide programmes, particularly those in LDC's, subject to the same disciplines as the more obvious supply-inducing policies.

The solution may therefore be, as with research and development expenditure, to monitor all infrastructural support, with particular scrutiny given to those programmes which have an agricultural bias and those which are sub-national in scope. This monitoring process would probably require a greater degree of transparency than is current for policies of this type. In particular the conditions for qualification for infrastructural support should be explicit. Further, if a developed country's infrastructural programme is to be classified as decoupled the onus would be on that country's government to show that more than x percent of the country's farmers will benefit, and that more than y percent of the benefits will accrue to non-farmers. The rationale for such a criterion is that if x and y are sufficiently high the programme would be an inefficient way of giving coupled support to farmers and any supply response would be fairly small. A criterion expressed in this way, perhaps with lower values for x and y, could also be used for LDC's. It is envisaged that LDC's would be so defined according to objective criteria (such as GDP per head) and that, as they become more developed they would follow the same discipline applying to developed countries.

DECOUPLED SUBSIDIES IN NEW ZEALAND: WELFARE GRANTS

The welfare schemes that are currently available to the rural sector in New Zealand are described in this section followed by a short discussion of whether such support is independent of production incentives. The schemes described below are the most evident ones currently available to farmers as well as to the general public in some cases. There may be other categories not presently evident to the authors. For the purposes of the following discussion, it is useful to distinguish between:

(1) persons in employment (with minimum hours per week for part-time employed);
(2) persons unemployed but seeking work;
(3) persons with children; and
(4) self-employed proprietors individual taxpayers
   (a) non-farm
   (b) farming
   (c) drought areas.
The range of welfare and income supplements available to farmers as well as to the general public are summarised in Table 1.

In terms of general benefits, it is not possible to identify amounts paid to rural people as compared with non-rural people. What is clear is that Family Benefit and Family Support are the only benefits payable to families irrespective of occupational groups. All other schemes, however, have some criteria which target the particular group they are meant to serve. Some of the above schemes that are directly or indirectly relevant to the farm sector are briefly described below.

(1) **Family Benefit**

A child allowance of $6.00 per week per child is paid as of right to all parents on children up to the age of 15 years or, if a full time student, up until the end of the year in which 18 years is reached. Arrangements are made for lump sum payments up to a period of 52 weeks for first children, and children starting school. Prior to 1 October 1986, the Family Benefit could be capitalised and used for home ownership purchase.

This benefit was drawn by 437,287 families in the March year to 1989; covering 877,204 children and costing $258.4 million (excluding Family Support). This scheme is administered by the Department of Social Welfare and does not influence production in any way.

(2) **Family Support**

Family Support is extra income for families caring for their children over and above the Family Benefit. It is payable through the tax system as a rebate or by direct payment through Social Welfare. Family Support is abated for annual incomes before tax of $17,000 per year or more and for a 6 child family is eliminated where the family income is over $40,000 per year.

Income tested beneficiaries have their Family Support entitlement automatically incorporated by the Department or Social Welfare in their benefit. If they receive income from an extra source, this can only be assessed by Inland Revenue when their tax return is processed.
The expenditures on Family Support were $180.3, $397.3 and $415.5 million in 1987, 1988 and 1989 respectively. As in the previous case, Family Support is fully decoupled.

(3) Special Needs Grants for Financial Hardship

Emergency grants may be granted on grounds of financial hardship to those who do not qualify for the ordinary Unemployment Benefit. This payment is available to the self-employed and others who have sudden loss of income or whose venture may have failed. Assistance is paid through a Special Needs Grant. Since farmers cannot qualify for Unemployment Benefit, a special assistance programme has been made available to them since 1986, as discussed next. Farmers can get grants on a long term basis without meeting requirements that recipients must be looking for other work and willing and able to take up job offers. Although this scheme places farmers at an advantage (sectoral advantage) to other self-employed persons, the amount of assistance is not related to the level of farm production.

(4) Special Assistance to the Farming Sector

A package for assisting the farming sector due to the downturn in the economic climate was announced by Government on 2 July 1986, with part of this package being the provision of Special Needs Grants to farmers in order to provide for essential day-to-day living expenses. Grants are made available to farmers who are in a critical financial position with no funds or no access to funds to meet their day-to-day living expenses. The criteria for payment are:

1. the farming operation is in financial difficulty and is not producing sufficient income to meet essential living expenses;
2. there is no significant off-farm income;
3. there are no assets unconnected with the farm operation which can be readily converted to cash;
4. a decision has been made to sell the farm and the asking price is realistic; or the family is in the active process of evaluating the ongoing viability of the farm.

Social Welfare believes such grants should not be paid for such purposes for longer than 6 months. Applicants must re-apply every 6 weeks. In 1989
total expenditure under the Special Assistance to the Farming Sector was approximately $319,285. In this case too, the amount of assistance is fully decoupled from farm output.

(5) Adverse Events Family Income Support

This programme was introduced in November 1988 when the East Coast of the South Island was declared an adverse event area due to a prolonged drought. This programme is funded by the Ministry of Agriculture, but is administered by the Department of Social Welfare. Applicants must be resident in the declared adverse event area. The basis of the application is a statutory declaration that the applicant is in difficulty because of the drought.

An adverse event area was also declared on the East Coast of the North Island due to drought in May 1989. Assistance measures for this area were announced in March 1990. These also included Adverse Events Family Income Support, but with somewhat different criteria. In 1989 some 3500 farmers received approximately $22.6 million under this scheme.

(6) Exit Grants

At the time of the introduction of the Adverse Events Family Income Support Scheme additional government support was provided for non-viable farmers to encourage them to leave farming. Providing a sale took place, the government undertook to ensure that the departing farmer’s assets were made up to the value of $45,000. Some 300 grants were made under this programme.

DISCUSSION

This section addresses the question of whether New Zealand’s experience with welfare grants in agriculture can provide guidance on decoupling agricultural assistance from production (and hence trade distorting) incentives. Based on the extent of welfare grants available in New Zealand and the past experience with production subsidies some conclusions are reached on the extent of decoupling in New Zealand agriculture in the current policy framework.
As pointed out earlier, the ideal decoupled subsidy would be paid to farmers in such a way that it would not exert influence on any of their decisions which affect output. Subsidy payments could be a recognition of a number of social and economic objectives pursued by governments. The EEC argues that its subsidies are social in character and hence are not provided for economic reasons. Such things as retaining people on the land, preserving the countryside and maintaining minimum incomes are all counted as social objectives.

Hence the question that arises is whether countries (like those in the EEC) could potentially reach such social objectives by different means than by blanket all-embracing support for farm prices. If such could be achieved, then production levels and input use might relate more closely to those which would have prevailed in the absence of blanket subsidisation.

In the case of New Zealand the social objectives being pursued at the present time include:

* prevention of financial hardship
* protection of the sick, disabled, etc.
* protection of the aged
* assistance in emergencies, including climatic emergencies and recovery
* assistance for economic disasters and recovery

A review of the government programmes available to the rural sector indicates that there does not appear to be an explicit welfare policy for rural people in terms of rural population goals or maintaining the countryside in its present form. There is also no firm identifiable policy for rural communities. The concept is basically one of a welfare safety net for protection of all people at some minimum standard.

The welfare safety net is necessary, in part, because earlier social and economic goals of full employment and balance of payments surpluses have been replaced by market and efficiency goals. In a full employment society, the minimum standard of living can be delivered by minimum wages and job spreading, with less emphasis on delivery by welfare payments. Similarly, agricultural assistance directed toward increased exports assisted marginal farmers to stay in farming, and also kept people in agriculture and rural communities at levels higher than were warranted by undistorted market prices and economic necessity. In turn, such assistance kept more schools open in rural areas, maintained small businesses in rural
communities and maintained levels of services such as health and roading at higher than otherwise levels. It is doubtful if these were the open goals of such programmes.

From 1962 to 1984 agricultural assistance policy was dominated by export lead growth priorities arising out of the recurrent balance of payments crises of the 1950s. For present purposes it is useful to discuss agricultural investment incentives separately from guaranteed minimum price schemes. These policies were introduced to increase production of exportable goods by second best methods in a fixed exchange rate environment. They contributed to the defined social objectives outlined above, but only as a by-product of their main aims.

The investment incentives operating in this period were tax write-offs for land development, standard values for livestock for tax assessment, the Livestock Incentive Grant Scheme (1976) and the Land Development Encouragement Loan Scheme (1978). These measures were aimed at the developing farmer with scope for greater farm production. They were designed to fund more easily the expansion of output the nation desired. In effect, they subsidised the cost of land development through an investment incentive. These measures tended to encourage farmers to bring more land into production rather than to intensify existing land use.

During the middle of the period 1962 to 1984, policy measures were introduced to provide greater security in farming. Land development was seen to be at risk if farmers were uncertain of future returns and sudden changes in returns. Their response to such risk factors was thought to be a slowing down of the land development process. Minimum price schemes had been developed in the immediate post-war period for milkfat, apples, meat and wool, with varying degrees of support being provided. In 1976, both the meat and wool minimum price support schemes were re-engineered to provide higher minimum price guarantees and mechanisms for replenishing the necessary buffer funds. In 1978, the Supplementary Minimum Price Scheme was introduced whereby milkfat, meat and wool prices would be topped up to provide desirable incomes for producers. In effect, incomes were designed to be not only secure, but sufficient to maintain a high level of re-investment in farm development and output.

Both the investment incentives and the guaranteed minimum price schemes were oriented to investment, growth and output. Neither were instituted for 'welfare' reasons. Both could be said to have slowed down economic
adjustment to changing economic circumstances which would otherwise have been required as market realities changed. On the other hand, both schemes could be said to have encouraged structural adjustment through increased and guaranteed incomes and investment incentives which funded new opportunities and directions.

Since minimum prices were applied across the board, they raised incomes for all producers and probably protected the weak, the marginal and the non-viable. In this sense the support schemes then in place constituted a type of social welfare payment to those who would have otherwise been a burden on welfare funds.

Welfare assistance in the form of Direct Income Support to the rural sector has increased since 1984 following the dismantling of the investment incentives and minimum price schemes, and the general decline in the profitability of farming. Universal benefits were available before these changes and have continued since. Income smoothing and loss write-offs through the tax system have been preserved as well. However as farming profitability declined through 1985 and 1986, it became apparent that the weak, the marginal and the non-viable farm units were not protected by the existing social welfare provisions. As a result, the Special Assistance to the Farming Sector Scheme was devised for farmers to meet temporary financial distress requirements.

This was the only mechanism whereby farm owners and their families could receive a full welfare benefit. Family Benefit and Family Support for children are payments based on the number of children in the family and are not designed to maintain the whole family. The Guaranteed Minimum Family Income Scheme is restricted to people on low wages and is not available to farmers as self-employed. In the case of the South Island drought relief scheme, it seems likely that in most cases of natural disaster, this kind of welfare assistance would probably be needed whether or not production incentives and price support were in place.

However, farmers in New Zealand remain more vulnerable to climatic and financial adversity than they were under previous subsidy programmes. Existing schemes do provide some compensation to farmers who are adversely affected by natural disasters. However, New Zealand's farm sector remains highly vulnerable to changes in the external environment. For example, fluctuating world commodity prices and the currency exchange rates are largely beyond the control of farmers. To the extent that the
agricultural sectors in the rest of the world are still highly protected, unilaterally decoupling agriculture has introduced new forms of risks into agriculture. From a global efficiency standpoint, an interesting question that arises is whether New Zealand farmers are receiving the right market signals from the rest of the world. Unless the level playing field is achieved, market signals (based on international comparative advantage) are bound to be distorted.

Welfare assistance (Direct Income Support) is oriented to financial need and is normally targeted to defined groups. Only those programmes introduced for relief in the economic downturn could be said to be substitutes for earlier production incentives in the sense that while guaranteed minimum prices were in place, a special assistance scheme for farmers would not be needed. There is no equivalent to the investment incentives such as the Livestock Incentive Scheme and the Land Development Encouragement Loan Scheme. Social Welfare still view the Adverse Events Family Income Support scheme and the Special Assistance scheme as subsidies to farming as they believe the conditions are more generous than for other sectors.

Among some of the measures that have been proposed for decoupling agricultural support from production the PEG seems to be receiving lots of attention. From New Zealand’s perspective, PEG could be expensive to implement in the sense that additional administrative structures have to be set up in order to monitor whether farmers are abiding to their respective PEGs. Even for developing countries, monitoring production can become an administrative and financial burden.

Direct income support delivered via the ‘welfare’ system seems to have worked well in New Zealand and the process has been partly facilitated by the existing institutional setup. For example the working of direct income support scheme can be monitored closely through the existing tax system. In this respect, developing countries that do not yet have a well developed tax system might experience some difficulties in implementing direct income support schemes. To the extent that direct income support schemes can be fully decoupled and are in general financially and administratively quite attractive they should be considered as serious candidates for decoupling agricultural support in the rest of the world.
CONCLUDING REMARKS

Decoupling farm support programmes from production still represents a major challenge to most western nations. There are tremendous political and administrative difficulties involved in determining which farmers shall receive what level of decoupled support. There are also significant political problems associated with switching from a system of price support to mechanisms such as direct income support. Any movement away from coupled support is also likely to lead to a fall in farmers' asset values.

In certain ways New Zealand has been more fortunate than other developed countries: high support levels have a short history in New Zealand, and farming systems did not come to depend on them to the same extent as in other countries. This paper has shown that farmers in New Zealand no longer receive subsidies that are linked directly to production. It can be deduced that when income supporting subsidies were in place, the need for targeted welfare assistance was reduced. Once the income supports were removed, the need arose for welfare type schemes based on financial need and not on production objectives. These welfare schemes provide decoupled support for the farming community as defined at the beginning of this paper and hence have in effect displaced part of the earlier broad assistance provided to agriculture.

The New Zealand experience has shown that a fully decoupled agricultural sector is possible. Farmers can survive the withdrawal of coupled support, to the benefit of the wider economy. Nevertheless there have been problems and the New Zealand experience can offer some guidance for countries wishing to implement decoupled policies. Under previous subsidy programmes farmers in New Zealand were insulated from many of the problems caused by climatic threats, or changes in the macro economy. In the absence of such programmes, governments could usefully encourage farmers to adopt risk management techniques such as drought strategies and insurance cover for adverse events in order to be better prepared in a world of freer trade and market realities.

As the OECD points out, 'multilateral action should not be seen as excluding unilateral action. To do so may involve foregoing the very substantial benefits from [agricultural policy] reform simply because of an inability of the countries concerned to harmonise their policy changes. A move to direct income support could provide such a signal while at the same time creating room to manoeuvre for governments in handling the social and political costs associated with reductions in assistance.'
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<table>
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<th>Welfare Scheme</th>
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<td>8 Adverse Events Family Income Support</td>
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