

**MULTILATERAL TRADE  
NEGOTIATIONS  
THE URUGUAY ROUND**

RESTRICTED

MTN.GNG/NG2/W/24

2 December 1988

Special Distribution

---

Group of Negotiations on Goods (GATT)

Negotiating Group on Non-Tariff Measures

Original: English

COMMUNICATION FROM AUSTRALIA

The following communication, dated 27 October 1988, has been received from the delegation of Australia with the request that it be circulated to the members of the Group.

---

GATT SECRETARIAT

UR-88-0608

**"USING THE EFFECTIVE RATE OF ASSISTANCE  
IN TRADE NEGOTIATIONS"**

A communication from the delegation  
of Australia to participants in the  
Negotiating Group on Non Tariff Measures.

## CONTENTS

Preface	4
Two Roles for the ERA	5
Measuring the Impact of Protection	5
Adding Transparency	5
A Simplified Framework	7
Assumptions and Conventions	7
Concepts and Definitions	9
Output Assistance	9
Input Assistance	10
Value Added Assistance	11
A Worked Example	13
Practical Aspects of Measuring the ERA	18
Choosing What to Measure	18
Choosing the Level of Aggregation	19
Finding the Unassisted Price	20
Measuring Value Added	20
Approaches to Measurement Techniques	21
Appropriate Techniques	24
Border Interventions	24
Government Payments or Revenue Foregone	28
Other Forms of Assistance	32
Questions and Answers about the ERA	34
ERA Calculation Flowchart	40
Select Bibliography	44
A Worked Example, Charted	17

(Preface by the Minister)

A key goal of the Uruguay Round of GATT negotiations is the improvement of access to markets by reducing or eliminating obstacles to trade.

Past attempts to negotiate the liberalization of trade have been hampered by the lack of evidence about the importance of some of these obstacles to trade. It sometimes has been difficult for governments to assess the full trade impact of even their own policies.

The techniques detailed in this booklet can help overcome this problem. They have been used in Australia - and elsewhere- for many years to evaluate trade protection and could be adapted to the evaluation of progress in GATT negotiations.

Objective evaluation techniques such as the ERA (Effective Rate of Assistance) should help each country in the negotiations reach decisions about changes to its own policies and in that way help all GATT members achieve the objectives of the Uruguay Declaration.

Michael Duffy  
Minister for Trade Negotiations

ONE

TWO ROLES FOR THE ERA

The historical achievement of the GATT has been its success in lowering tariff barriers. This success has been undermined, however, by the expanded use of non-tariff measures (NTMs) to protect markets. The proportion of imports covered by the most restrictive NTMs in developed countries is about the same as that affected by tariff reductions in the Tokyo Round (1). The spread of these NTMs is in part attributable to the lack of any international surveillance of the effect of trade restrictive policies and practices.

Measuring the Impact of Protection

In the Uruguay Round the GATT is aiming - not for the first time - to reduce or eliminate all obstacles to trade including tariffs and non-tariff measures. In the 1982 Work Program the GATT set itself a similarly ambitious task which, after four years of discussion and review, had not led to the elimination of a single trade barrier. The use of an objective technique for measuring the effects of these distortions and for demonstrating the extent to which agreements reduce those effects will help to avoid such disappointing results in the Uruguay Round.

The Australian Government believes that the Effective Rate of Assistance (ERA) framework provides a manageable and convenient way of measuring the effects of many different trade barriers. As a 'yardstick' for monitoring international movements in the level of trade barriers, the ERA would contribute to greater transparency of those arrangements which restrict trade. It would thereby impose a discipline on member countries to honour their commitments to reduce trade barriers and would make it more difficult to substitute less visible, more contrived, forms of assistance for more visible forms such as the tariff.

An annual series of ERA measurements of assistance to an industry will produce a series of "snapshots" that will be internally consistent and will illustrate assistance trends in that industry. Because high levels of assistance are strongly associated with high levels of trade protection, these trends in effective assistance levels can be used to monitor trade liberalization measures taken in the context of the Uruguay Round.

Adding Transparency

There is growing recognition of the need to underpin international agreements with domestic policies that are more transparent to producers, consumers and taxpayers if meaningful

and sustained reductions in trade barriers are to be achieved. Greater transparency of trade barriers at the domestic level would also enhance understanding within member countries of the economic costs that trade barriers impose on their own economies.

In Australia, this transparency is substantially assisted by the work of the Industries Assistance Commission (IAC) which, as part of its statutory charter, is required to report annually on assistance provided to industries and the effects of that assistance.

The IAC has used the ERA framework for measuring and reporting on levels of industry assistance for almost two decades. Within that framework, it has documented government interventions assisting industries and provided estimates of nominal and effective rates of assistance to Australian agricultural and manufacturing industries. More recently, the IAC has also published some preliminary estimates for the mining sector.

TWO

A SIMPLIFIED FRAMEWORK

One of the appealing aspects of the effective rate concept is its relative simplicity and ability to consistently incorporate into a summary measure diverse forms of assistance. This ability is due to the simplified analytical framework on which the effective rate concept is based - a static model which measures assistance under partial equilibrium conditions.

Used in this way, the ERA measures the initial impact of assistance arrangements on industry incentives and is not intended to take into account the broader supply/demand responses which assistance arrangements induce throughout the economy, or the effects on world trade volumes and prices. The measurement of these dynamic effects of assistance requires the use of more sophisticated and data-intensive economic models that explicitly incorporate the anticipated behavioral responses of producers and consumers.

The abstractions from reality necessary to maintain the relative simplicity of the ERA means that the estimates should be interpreted carefully - hence our suggestion that they be used only as a 'yardstick' for monitoring progress and not as part of the formal bargaining process.

Despite the simplifying assumptions, the ERA is a robust technique which will produce verifiable (in the sense of repeatable) results. Australia has found the measurement of disparities in ERAs between industries to be a useful indicator of the likely impact of government interventions on economic efficiency.

Assumptions and conventions

The ERA concept views production in the economy as being composed of discrete activities/industries which are influenced by the combined effects of all government assistance. The ERA is concerned with the measurement of the initial impact of all government assistance that directly affects each activity/industry.

To simplify such measurement, the following assumptions and measurement conventions are used:

. For each tradeable good produced locally there exists a perfect substitute available from world trade.

. In the absence of assistance, domestic prices of tradeable goods would be set by world trade prices. For

import-competing goods, domestic prices would be import-parity prices approximated by the landed-duty-free (ldf) or cost-insurance-freight (cif) price of competing imports. For goods exported, domestic prices would be export-parity prices approximated by export returns equivalent to the domestic wholesale price.

. The direction of trade in the absence of assistance can be assessed. Usually this is further simplified by assuming that import-competing goods remain import-competing and that goods exported continue to be exported.

. The production relationships between inputs, between outputs and between inputs and outputs for each activity remains unchanged by the structure of assistance.

The above assumptions and conventions considerably reduce the data required to enable the different forms of government assistance to be measured on a consistent basis. They allow the difference between actual returns to value-adding factors and equivalent 'world-trade' returns to be used to measure the initial impact of government assistance on each activity/industry.

### THREE

#### CONCEPTS AND DEFINITIONS

Trade barriers are usually applied to internationally traded goods and services in order to selectively assist the domestic activities which produce them. Assistance to domestic industries need not, however, take the form of a border barrier. The assistance may result from government interventions such as subsidies or purchasing preferences that reduce the level of trade (and the gains from trade) without physically restricting entry of foreign products.

High levels of assistance to industry therefore are associated with significant obstacles to trade. Where an industry receives a low level of assistance relative to other industries there are likely to be few obstacles to trade.

The ERA framework explicitly recognises this connection between obstacles to trade and other forms of assistance to domestic productive activities by including the direct effects of all interventions that assist domestic activities. Specifically, the ERA incorporates the separate impact of government interventions which assist:

- . returns from outputs
- . the use of materials, and
- . value added.

The two most widely used measures are the nominal rate of assistance which measures the assistance provided to outputs and the effective rate of assistance which measures the net assistance to an industry's value added.

The component measures are more formally defined below.

#### Output Assistance

Various forms of assistance to outputs, such as tariffs, production subsidies, import quotas, voluntary export restraints, and purchasing preferences increase the gross receipts of producers.

The direct impact of government interventions on the gross returns from production may be expressed as a rate or as its equivalent lump sum.

- . Nominal rate of assistance on outputs or products (NRP):

This is the percentage change in gross returns per unit of



assistance (eg, production subsidies) which benefit the production of intermediate inputs without affecting prices paid by user industries. The nominal rate is given by:

$$\text{NRM} = \frac{(M - S_m - M')}{M'} \times 100$$

where  $M$  = value of material inputs used in the production activity.  
 $S_m$  = subsidies on inputs.  
 $M'$  = unassisted value of material inputs (ie, the estimated value of material inputs without assistance).

. Tax on materials ( $T_m$ ):

This is an estimate of the change in costs to user industries due to government intervention altering the prices paid for intermediate inputs. It is the notional amount of money equivalent to the nominal rate of assistance on materials. The tax on materials is given by:

$$T_m = M - S_m - M'$$

Value Added Assistance

Value added is the net return to the primary or value-adding factors (land, labour and capital) after deducting from gross returns the cost of material inputs used in the production activity.

Assistance to value added can be measured as either a rate or as a lump sum.

. Direct assistance to value-adding factors ( $S_{va}$ ):

This is an estimate of the sum of money equivalent to any direct subsidies that increase the returns from the use of value-adding factors in a particular activity: for example, special income-tax concessions to an industry or select group of industries.

. Effective rate of assistance(ERA):

This is the percentage change in returns per unit of output to an activity's value-adding factors due to the entire assistance structure. It measures net assistance to an activity by taking into account not only assistance to output and value-adding factors, but also the penalties (eg, tariffs and excise taxes) and benefits (eg, input subsidies) of government intervention on inputs. It is given by:

$$\begin{aligned} \text{ERA} &= \frac{\text{VA} - \text{VA}'}{\text{VA}'} \times \frac{100}{1} \\ &= \frac{[\text{P} - \text{M} + \text{Sp} + \text{Sm} + \text{Sva}] - [\text{P}' - \text{M}']}{[\text{P}' - \text{M}']} \times 100 \end{aligned}$$

Where VA = value added with assistance.

VA' = value added without assistance.

Net Subsidy Equivalent (NSE):

This is an estimate of the change in returns to an activity's value-adding factors due to assistance. It is the notional sum of money, or subsidy, necessary to provide a level of assistance to an activity equivalent to its effective rate of assistance.

The NSE is the gross subsidy equivalent plus assistance to value-adding factors, minus the tax on materials. It is given by:

$$\text{NSE} = (\text{P} + \text{Sp} - \text{P}') - (\text{M} - \text{Sm} - \text{M}') + \text{Sva}$$

FOUR

A WORKED EXAMPLE

The relationship between the main component measures of the ERA can be illustrated by an example based on the Australian Iron and Steel industry.

<u>CALCULATION</u>	<u>VALUE</u> <u>(\$M)</u>	<u>DATA SOURCE</u>
(1) Value of output (P)	5194.9	Sales and transfers out and production subsidies (adjusted for selling and distribution expenses) for ASIC (Australian Standard Industry Classification) 3-digit 'Basic iron and steel' industry from the manufacturing census conducted by the Australian Bureau of Statistics (ABS).
LESS inputs (M)	3364.7	Materials and fuels used by ASIC 3-digit industry 'Basic iron and steel' from the manufacturing census conducted by the ABS.
= (2) <u>Assisted</u> <u>Value Added</u>	<u>1830.2</u>	
(3) LESS Assistance to outputs...		

- . Tariffs 406.2 The GSE of tariffs derived from General tariff rates applying to competing imports of 'Basic iron and steel'. Requires the construction of a concordance between 'Basic iron and steel' product groups (used by the ABS to collect manufacturing census data) and the Customs tariff - the GSE for each product group is derived by subtracting from each group's assisted value of output, its 'unassisted' value (estimated by deflating each group's assisted value of output by its average nominal tariff rate). The GSE for the 'Basic iron and steel' industry is the summation of each product groups' GSE.
- . Production subsidies 19.3 Subsidies paid to producers of goods comprising the 3-digit 'Basic iron and steel' industry. Data taken from government budget papers.
- . Export Incentives 1.6 Export incentives paid for market development and promotion to producers exporting goods of 'Basic iron and steel'. Data from government budget papers and the Board responsible for administering the Schemes.
- ...and  
Assistance  
to inputs  
(Tm)

. Tariffs on materials -208.3 The Tm of tariffs derived from General tariff rates (adjusted for concessional tariff entry of imported inputs) applying to competing imports of material and fuel inputs used in the 'Basic iron and steel' industry. Requires the construction of a concordance between each 'Basic iron and steel' material group (used by the ABS to collect manufacturing census data) and the Customs tariff.

The Tm for each material group is derived by subtracting from each group's assisted value of materials and fuels used, its 'unassisted' value (estimated by deflating each group's assisted value by its average nominal tariff rate). The Tm for the 'Basic iron and steel' industry is the summation of each material group's Tm. The Tm is negative because it represents a penalty ("negative assistance") to the Iron and Steel industry.

= (4) 1611.4  
Unassisted  
Value Added

(5) Net Subsidy Equivalent ( 2 - 4 ) 218.8

The Nominal and Effective Rates of Assistance are, therefore;

Nominal Rate:  $\frac{(3)}{(1) - (3)} \times 100 = 9\%$

Effective Rate:  $\frac{(5)}{(4)} \times 100 = 14\%$

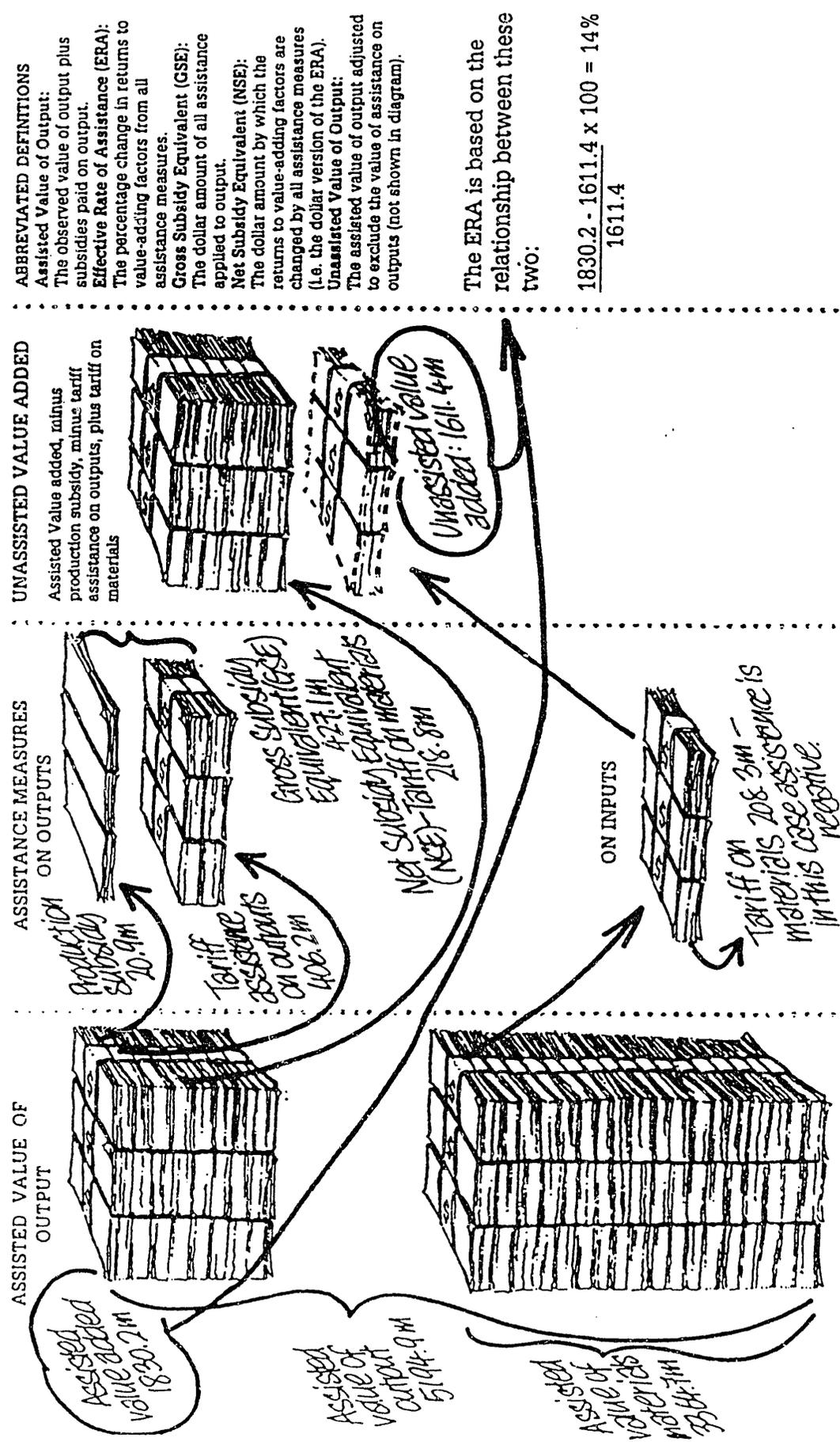
Or, in terms of the values in the Table;

Nominal Rate =  $\frac{\$5194.90 - \$4767.80}{\$4767.80} \times 100 = 9 \text{ percent}$

Effective Rate of Assistance (ERA)

$$= \frac{\$1830.20 - \$1611.40}{\$1611.40} \times 100 = 14 \text{ percent}$$

ERA: AUSTRALIAN IRON AND STEEL  
INDUSTRY



## FIVE

### PRACTICAL ASPECTS OF MEASURING THE ERA

For the ERA to be an effective 'yardstick' for monitoring progress on the negotiations, it is highly desirable that all countries adopt a common approach to their measurement. There will inevitably be some differences in approach to meet certain measurement problems in each country. Small differences between countries will not be important if the same approach is used on each occasion.

In determining this common approach the main considerations should be simplicity and low threshold costs for countries which have not previously made such measurements. Choices need to be made about what to measure, the level of industry aggregation, suitable benchmarks and appropriate measurement techniques.

#### Choosing what to measure

There are many different actions by governments that can create barriers to trade. Therefore, it is desirable that calculated ERAs incorporate all major forms of assistance to industries/activities. Assistance in its broadest sense would include any government action which favours particular industries or activities at the expense of others.

Not all of these government interventions are the subject of GATT obligations. However, all measures which are proscribed by the GATT and all so-called "grey area" measures can, at least in principle, be included in the ERA measurement. If any of these measures are altered as a result of Uruguay Round agreements while all other measures (on both the input and output sides) are held constant then any change in the ERA may be attributed to the changes in the measure concerned.

For measuring ERAs, it is useful to classify government actions on the basis of whether they directly assist output, inputs or value added in the activity.

Typical examples of output assistance are:

- Domestic pricing arrangements
- Export subsidies/taxes
- Local content schemes
- Marketing supports
- Production subsidies
- Quantitative import restrictions
- Tariffs
- Variable levies
- Voluntary export restraints

Typical examples of input assistance are:

- Input subsidies
- Local content schemes
- Tariffs
- Commodity Taxes

Typical examples of direct assistance to value added are:

- Concessional credit
- Income tax concessions

Clearly, not all forms of assistance will be relevant to all industries and some forms (eg, tariffs) can assist both outputs and inputs. Forms of assistance which assist suppliers by raising prices will, of course, reduce assistance to user industries.

In practice, it may not be feasible to attempt to measure all possible forms of assistance in all sectors because a multitude of non-transparent forms exist which, by their nature, are inherently difficult to measure. This applies not only to the more obscure forms of assistance such as distribution restrictions and certain standards measures, but also can apply at times to some of the more common non-tariff measures, such as quantitative import restrictions and local content schemes. The final section of this paper contains suggestions on ways to measure such restrictions.

Countries would greatly facilitate the objective of greater transparency in trade barriers by minimising their use of less visible forms of assistance, and by introducing arrangements (such as tendering of import quota or allowing a transfer market to operate legally) aimed at making existing forms more transparent.

#### Choosing the level of aggregation

Equal assistance to all industries may be equivalent to no assistance. If all industries are equally assisted then there is no distortion of the underlying relative cost structure and no distortions are likely to arise in the flow of resources to different industries. It is the dispersion in nominal and effective rates of assistance between industries/activities rather than absolute levels which should be the focus of most attention in relation to the allocation of resources within an economy.

The objective of greater transparency would be best met by having assistance estimates as disaggregated as possible, so that disparities are clearly evident at a fine level of detail. All countries should strive therefore to achieve as a minimum level

of disaggregation the 3-digit level of the International Standard Industrial Classification. In Australia, the IAC estimates for manufacturing are disaggregated to the 4-digit level of the Australian Standard Industrial Classification (which is generally a finer version of the 4-digit Group of the International Standard Industrial Classification) and the commodity level for agriculture.

When calculating average rates for aggregated groups of industries or the sector as a whole, estimated 'unassisted' value of output should be used as weights for nominal rates on outputs and 'unassisted' value added as weights for effective rates. This is necessary to maintain consistency of the effective rate concept when aggregating.

#### Finding the unassisted price

The benchmark against which levels of assistance should be measured is the situation which would prevail in the absence of each particular intervention. In the case of border interventions, which affect prices by restricting trade, this involves the use of prices at which goods are exchanged in international trade as the benchmark price with which to compare the domestic price - on the assumption that the domestic price of an internationally traded good would equal its world price if the trade restrictions were removed.

For an import-competing good (one where imports are significant), the ldf (or cif) price of the imported equivalent will represent the benchmark or unassisted price. However, for goods predominantly export-oriented, export parity (the export returns equivalent to the domestic wholesale price) would be the appropriate benchmark price.

For interventions which do not apply at the border, the choice of the appropriate benchmark to use for measuring assistance is less clear cut. Ideally the benchmark would be characterised by neutrality as between different industries. However it may not be easy to decide what is a neutral situation for certain instruments of assistance, such as the income tax system. It is largely for this reason that the IAC has, in the past, only measured assistance from income tax concessions which are available on a selective basis to nominated industries or sectors.

#### Measuring value added

Value added represents the returns to the primary factors (land, labour and capital) after deducting from total returns the costs of material inputs used in the production process. Since primary factors are assumed to be non-traded, the returns to these factors will accrue to their owners in the form of rents, wages and profits. It is the extent to which the activity's returns to

primary factors are initially increased by the assistance structure (relative to the unassisted situation) which the effective rate is attempting to measure.

Since value added is measured as a residual value, questions arise as to the appropriate measure of an industry's output, and what input costs should be excluded from an activity's value added. The appropriate point in the distribution chain for measuring rates of assistance is that which is most comparable with the ldf (or cif) value of comparable imports - thus for manufactured products the most appropriate value of output would normally be ex-factory (adjusted to exclude selling and distribution expenses) and for agricultural produce the farm-gate value.

On the inputs side the deduction of traded material inputs from value added is straightforward. However, difficulties arise with the appropriate treatment of service inputs (eg, electricity, financial charges etc). To the extent that these services are non-traded, it can be argued that they have similar properties to primary factors and hence one approach would be to include the value-added component of service inputs as part of the activity's value added. <sup>(3)</sup> Under this approach, the calculated effective rate relates to the production of both the service inputs and the final product being considered.

An alternative approach which has been suggested would be to exclude from the activity's value added the value-added component of service inputs. <sup>(4)</sup> These two approaches can be modified to avoid the problems of decomposing service inputs into their components by either entirely including (Corden) or excluding (Balassa) the cost of services from the user activity's value-added. Provided service and other non-traded inputs are a small proportion of the total, there will be little difference in the estimated effective rates derived from the alternative formulations over a wide range of nominal rates.

The approach used for service and other non-traded inputs by the IAC is aimed at keeping the measurement methodology as simple as possible. Where data permits, service inputs are generally deducted from the value added of the user industries and allocated a zero rate of assistance.

#### Appropriate measurement techniques

As previously indicated, the nominal and effective rate measures of assistance include a wide range of instruments which assist industries differently. The largest set of instruments, for instance, operate at the border (eg, tariffs, import quotas) to restrict trade and assist producers by increasing the domestic price above the level that would otherwise prevail. Other measures assist producers by increasing their gross returns through government payments (eg, production subsidies), by

increasing their returns to value-adding factors (eg, income tax concessions) or reducing the prices paid for material inputs (eg, input subsidies).

The measurement of those arrangements which assist producers by raising domestic prices therefore require the extent of any price increase to be estimated. Where the assistance is by way of tariffs imposed on competing imports, the extent to which prices can increase is related directly to the General tariff rate as this sets the margin between local and world prices. In this sense, tariffs represent a transparent form of assistance.

Similarly, forms of assistance which involve government payments to industries (eg, production and consumption subsidies) are relatively transparent and as such can be incorporated into the nominal and effective rate estimates once the size of the payments are known.

However, the price effects of many forms of border restrictions can be far less visible and hence inherently more difficult to measure. The visibility of quantitative restrictions for example, will depend largely on the administrative arrangements in place for allocating entitlement. In cases where entitlements are allocated by open tender and/or where a well developed transfer market exists, the prices paid for these entitlements can be used as a reasonable measure of the price effects of these arrangements.

Where markets for entitlements do not exist (such as when entitlements are allocated by historical performance and no well developed transfer market exists) the price effects can be very difficult to measure. This problem also applies to many other forms of assistance such as local content plans, import embargoes and voluntary export restraints. In these cases, the only technique available is direct price comparisons: attempting to measure the difference between the observed domestic price (which includes the effects of assistance), and the world-trade price.

Price comparisons can be made in several ways - the most common being to measure the difference between the domestic price (at a comparable point in the distribution chain to the imported product) and the ldf or cif price of substitute imports. Another possible approach is to work backwards from the selling price of the imported product so that the price received by the importer can be compared with its ldf (or cif) price. However, this approach also assumes that quota rents accrue entirely to importers (which may not be the case) and requires detailed information on selling mark-ups, distribution expenses and any consumption taxes which may be levied on the product.

The most appropriate domestic price to use in price comparisons is the domestic manufacturer's ex-factory price (ie, price to wholesaler) as this is generally the price that is comparable

with the ldf (or cif) price of competing imports. Where the ex-factory price includes a component to cover selling and distribution expenses, these costs should be deducted from the ex-factory price. The ldf (or cif) prices of imported equivalents used in price comparisons should be representative of the prices which would be likely to apply if the existing trade restrictions were removed. This would generally be the lower international ldf (or cif) price.

Comparing manufacturers' ex-factory prices with imported ldf (or cif) prices will be a more reliable measure of the price increases from quantitative restrictions where the quota rents accrue to importers. In cases where quota rents are shared between importers, wholesalers and retailers this technique is likely to underestimate the price increases arising from quantitative restrictions.

Although price comparisons are widely used as a means of measuring the price effects of border restrictions, the results must be interpreted cautiously. The major problem is to be able to identify products which are perfect substitutes. Even where imported products may physically be identical to domestic products, consumer's perceptions of differences (either real or otherwise) are likely to exist in the market place whereby the imported and domestic equivalents are regarded as imperfect substitutes. For example, the local product may command a premium over the price of the imported equivalent because of perceived advantages by consumers in buying locally eg, continuity of supply, preference for local brands, accompanying services etc. Thus, it is probable that measured price differences will be due to other factors as well as the assistance arrangements.

For these reasons, price comparisons are used to measure assistance only when no other techniques are available. The accuracy of price comparisons is likely to be increased where goods are relatively homogeneous (eg, steel, basic chemicals) rather than heterogeneous goods (eg, automobiles or particular types of clothing and footwear) which may be greatly affected by fashion trends, brand preferences etc. Price comparisons are most valid at highly disaggregated levels when detailed specifications of the items to be compared are available.

## SIX

### APPROPRIATE TECHNIQUES

The following sections suggest approaches to the measurement of three broad categories of government intervention:

#### Border Interventions

- . tariffs
- . variable import levies
- . quantitative import restrictions
- . voluntary export restraints
- . import embargoes

#### Government Payments or Revenue Foregone

- . taxes
- . export subsidies
- . production and consumption subsidies
- . marketing support
- . concessional credits
- . income tax concessions

#### Other forms of Assistance

- . domestic pricing arrangements
- . local content schemes

### Border Interventions

#### ..Tariffs

Customs tariffs remain an important form of assistance to industries in most countries. While ad valorem duty rates are by far the most common form of tariff, specific and composite duty rates are also applicable to certain imported goods.

For measuring assistance provided by tariffs, General (rather than Preferential) duty rates are used. This flows from the assumption that the world reference price is set by supplies from General sources and that domestic producers are able to raise their prices by the same proportion as the landed prices of competing imports are increased by tariffs.

The evaluation procedure involves the following steps:

- . commodities produced by each industry are identified;
- . tariff items under which closely competing goods would be imported are identified for each commodity;
- . tariff rates (levied on an fob valuation basis in Australia) are adjusted to their lower nominal rate (ldf or cif) equivalent using estimated fob/ldf (cif) ratios (this step would not be necessary in countries that use an ldf (cif) basis of Customs valuation);
- . a set of 'world trade' domestic production weights are calculated for each industry by dividing the commodity's value of domestic sales by one plus the estimated nominal rate for each commodity (<sup>5</sup>);
- . average nominal rates of assistance are calculated for each industry using domestic (world trade priced) production weights; and
- . since only domestic sales are assisted directly by the tariff, average nominal rates are reduced according to the proportion of each industry's production (in unassisted terms) exported at world prices.

Most countries operate systems of concessional entry for goods not produced locally. In Australia, the current system of Commercial Tariff Concessions allows for entry of imported goods at concessional tariff rates (usually zero or 2 per cent) where it can be established that no goods serving similar functions are produced, or capable of being produced in the normal course of business, in Australia.

Since the concessional tariff entry of imports lowers the tariff impost on user industries, nominal rates of assistance on materials of user industries based on General tariff rates must be adjusted downward to take account of the concessional entry of imported materials. By lowering nominal rates of assistance on materials for user industries, concessional entry schemes increase the ERA afforded user industries. However, concessional entry of goods should not in principle erode the nominal (tariff) assistance on outputs of industries since, by definition, goods eligible for the concession are not produced locally.

#### ..Variable Levies

Variable levies are a special form of tariff in which the ad valorem rate is continuously changed in order to ensure that variations in world prices do not undermine an administered domestic price.

The measurement of the assistance due to these levies could employ the techniques appropriate to the measurement of tariff assistance. A time-weighted average of nominal levels of assistance for each commodity could be derived to give an annual estimate.

#### ..Quantitative import restrictions

Quantitative import restrictions, in the form of import licensing arrangements and tariff quotas (<sup>6</sup>), are a common barrier used by countries to restrict international trade. Quota restrictions may be specified in volume or value terms (ie, limits to the number of items imported or the aggregate value of certain imports). They provide industries with open-ended assistance in the sense that when their international competitiveness declines, the protective incidence of the quota will automatically increase. (<sup>7</sup>)

Tariff quotas can have similar effects on domestic prices if the penalty duty associated with the particular tariff quota is set so high as to prohibit imports in excess of the quota. By restricting the supply of imports, the prices of these goods (and hence domestically produced substitutes) will be increased above their landed-duty-paid price plus normal profits. However, unlike import licensing which places no upper limit on the extent of these price increases, tariff quotas limit the price increases to the total duty rate payable on above-quota imports. When significant above-quota imports occur, the effects of the tariff quota will therefore be similar to a tariff equivalent to the base duty and penalty rate paid on above-quota imports.

To date, five measurement techniques have been used in Australia by the IAC to estimate the assistance impact of quotas. Each of these techniques attempts to measure the ad valorem equivalent of a quota. That is, the difference between the domestic price of locally produced goods and the ldf (or cif) price of closely substitutable imports. The techniques used have been:

- (i) Price disadvantage surveys: These directly derive the differential between the ex-factory price of locally produced goods and the ldf (or cif) price of their imported substitute. (<sup>8</sup>) As discussed previously, although in principle a relatively simple procedure, in practice it is difficult and costly. In most cases, identifying an imported good which is a perfect substitute for the domestic product will be difficult. Furthermore, as quotas often apply to categories of goods that cover a wide range of heterogeneous products that are likely to receive different levels of assistance from the quotas, numerous price comparisons

will be necessary if reliable estimates of the protection provided by quotas are to be made.

- (ii) Relative price indexes: This approach may be used to reduce the cost of price comparisons. It assumes that, once the nominal rate of assistance afforded by a quota has been derived for a particular base year, its future levels can be determined by adjusting the base year figure according to the relative movements in domestic and import price indexes. This approach has been rarely used in Australia because of the technical limitations of available price indexes.
- (iii) Quota transfer sale prices: Because of their scarcity, a value accrues to entitlement to import goods under quota which is termed the quota rent. This approach compares the dollar prices paid for access to quota entitlement (ie, their quota rent) to the average fob unit value of imports in order to derive an ad valorem tariff equivalent of the quota.
- (iv) Quota tender sale premiums: Under this method of allocating quotas, importers secure quota by offering to pay an ad valorem tariff rate above the base duty rate on imports. This approach uses the clearing premium bid at the tender sales to estimate the difference between the base tariff rate and the protective incidence of the quota.
- (v) Penalty rates of duty: When tariff quotas are imposed and there are substantial levels of above-quota imports, the quota is, in effect, made redundant. In these circumstances, the specified penalty tariff rate is considered to be the operative instrument of assistance.

The administrative arrangements associated with quantitative import restrictions have significant implications on both the levels of assistance which are afforded quota-protected industries and the ability to accurately measure the assistance provided. For example, the reliability of using tender premiums to measure quota assistance will tend to vary according to the particular quota arrangements in place - such as the proportion of quota tendered, the basis on which tender bids are expressed and whether the quota arrangements are value or volume-based. In general, however, the use of tender or transfer premiums (when available) to measure assistance will be a much more reliable means of measuring average levels of quota assistance than using either price comparisons or price indexes.

..Voluntary Export Restraints

VERs are a special case of quantitative import restriction in which exports of a particular commodity are restricted by the exporting country at the request - either formal or informal - of the importing country to a specified level (in volume or value terms) within a given period. By restricting the supply of imports, VERs can raise the domestic price in the importing country. The quota rents due to restrictions of supply under a VERs are likely to accrue to the exporters and not the importers as for import quotas.

In some major exporting countries (eg, Hong Kong for clothing and textiles) transfer prices for export entitlements exist and are likely to be the best method of measuring the assistance provided by VERs. Where this information is not available, one option would be to compare the export price to the country subject to the VER with the export price to third countries not subject to the VER.

Another option would be to observe the differences between the domestic prices in the importing country and the exporting country subject to the VER. The observed price differences would, of course, need to be adjusted for non-assistance factors such as sales taxes and exporting, freight and importing costs.

The extent to which domestic prices in the importing country are affected by a VER will depend upon the competitive position of the exporting country subject to the VER relative to competition from other countries not subject to the restraint. To the extent that not all quota rents created by VERs accrue to the exporting country then the above procedures may tend to underestimate the assistance afforded by the VER.

#### ..Import embargoes

Where import embargoes are used to support domestic pricing schemes, assistance based on comparisons of export and domestic prices will implicitly include the assistance they provide. In other cases, the assistance provided by import embargoes is difficult to quantify as price comparisons must be used based on world prices for products not imported.

#### Government Payments or Revenue Foregone

##### ..Government commodity taxes

Government commodity (eg, excise and sales) taxes which are applied equally to imported and domestically produced goods do

not affect the nominal assistance provided to the producers of those goods. However, this does not apply to commodity taxes which discriminate between imported and domestically produced goods by being levied differently on imports. Such differences in the taxes have the same effects as tariffs and are measured as tariffs. However, because commodity taxes are usually applied at a stage beyond the ldf (such as the wholesale or retail price), the nominal rate equivalent will normally be higher than the rate of commodity tax.

Commodity taxes levied on intermediate inputs penalise user industries in the same way as tariffs by raising input prices above what they would otherwise be. In Australia, the incidence of commodity taxes on intermediate inputs is limited mainly to excise taxes levied on petroleum products, since both the excise and sales tax legislation allows for exemption of those taxes on intermediate inputs. Similarly, schemes which remove the burden of commodity taxes levied on intermediate inputs to particular sectors (such as diesel excise rebates) are not treated as assistance to those sectors.

#### ..Export subsidies/taxes

Various schemes are operated by most countries to encourage exports. These schemes include direct export subsidies, subsidies for market development expenditure and trade promotion.

Government expenditures on these schemes are evaluated in the same way as production bounties.

Producers may also be assisted on domestic sales in cases where export subsidies are significant. Export subsidies, by raising export returns, will also tend to raise domestic prices as producers equalise returns across both domestic and export markets. Whether domestic prices increase by the full amount of the export subsidy will, of course, depend upon such factors as the extent to which imports are constrained by tariffs or other arrangements.

Where there are no constraints on imports, any increase in the domestic price is likely to be minimal and limited to the ldf (or cif) price of competing imports. Export taxes have the opposite effect and in addition to penalising exports, may also penalise domestic sales by reducing domestic prices below what they would otherwise be. Export taxes will therefore benefit domestic users of products subject to export taxes and will increase the ERA of user industries.

#### ..Production and consumption subsidies

Government expenditure on production subsidies should be included in the nominal and effective rates of assistance for each recipient industry. Where the subsidy payment is an ad valorem rate based on the value of output, the nominal rate on output will correspond to the subsidy rate. However, for other production subsidies (such as value added or specific subsidies), the nominal rate on output is the subsidy payments expressed as a proportion of the value of output of subsidised products.

Production subsidies paid to manufacturers can be structured such that the subsidy benefits, to some extent, the component suppliers through manufactures paying higher input prices. This can be the case, for example, with production subsidies paid to manufacturers based on value added or where production subsidies have local content provisions (requiring a specified percentage of local content to be achieved before the subsidy is paid). In cases such as these, the distribution of the subsidy between the manufacturer and the component suppliers is exceedingly complex and often difficult to evaluate.

Where it is considered that the entire production subsidy is distributed to the component suppliers, the nominal rate on output of the final good manufacturer is still increased by the full amount of the subsidy (which reflects the actual payment of money to the manufacturer), but a corresponding increase should be made in the manufacturers' nominal rate of assistance on materials (to reflect the higher prices paid by the manufacturer for components). Consequently, although the nominal rate on output is still increased for the final good manufacturer, the effective assistance remains unaltered. However, often the extent to which the subsidy accrues to component suppliers cannot be estimated accurately.

Unlike production subsidies which assist local production by being paid on locally produced goods, input (or consumption) subsidies are paid on both imported and domestic goods and therefore lower the price of a material or service to a user industry. These subsidies should therefore be included in the ERA as input assistance for the user industry and not as assistance on outputs to the industry producing the material or service (even if producers actually receive the subsidy payments).

#### ..Marketing support

Many countries assist the marketing and promotion of agricultural produce and products made from agricultural commodities. Such payments are best regarded as output assistance to recipient industries.

## ..Concessional credit

Many countries extend concessional credit to particular industries or sectors. In Australia, primary producers have in the past received concessional finance from several sources. Most of these arrangements were terminated as part of the deregulation of the financial system in the mid-80s.

To estimate the assistance element associated with concessional credit, the actual interest rate charged on loans can be compared with an assessed 'market' interest rate to determine an interest rate differential to apply to the value of loans outstanding in each year. The selection of an appropriate interest rate to use as an indicator of the 'market' rate is somewhat arbitrary, and should be chosen with the type of finance in mind. For the majority of farm loans considered in Australia, the unregulated bank overdraft interest rate is used.

## ..Income taxation concessions

Income taxation concessions are widely used in countries to assist particular industries or sectors. In Australia, taxation concessions of a discriminatory nature apply mainly to the agriculture sector. Income taxation concessions to primary producers which are not available to other taxpayers are of three main types:

- . those allowing primary producers to make special deductions which are not available to other commercial taxpayers under general income tax provisions;
- . those allowing primary producers to deduct the cost of items of plant over shorter periods than is the case for taxpayers generally; and
- . tax averaging provisions.

The revenue forgone by allowing the depreciation of certain items not generally depreciable (eg, land clearing expenses and buildings) should be treated as assistance to recipient activities. For these measures, the full amount of the revenue forgone by government can be regarded as assistance.

Accelerated depreciation provisions assist eligible taxpayers by enabling a deferment of tax liability. The benefit derived can be thought of as an interest-free loan for the period of the deferment. To estimate the value of accelerated depreciation provisions, the difference between the concessional rates of depreciation and the normal rates which would otherwise have applied should be assessed, and standard discounted cash flow

techniques applied to the future stream of allowable tax deductions under the two alternative depreciation rates.

In the case of the income tax averaging provisions which in Australia apply only to primary producers, the total revenue forgone by the Government is included as assistance. This reflects the use as a benchmark the tax system that applies generally to other activities or sectors.

### Other Forms Of Assistance

#### ..Domestic pricing arrangements

Administered domestic prices designed to maintain high returns to local producers are usually underpinned by import embargoes or tariffs. The price differential is maintained by diverting supplies from the usually higher priced domestic market to the lower priced export market.

When domestic pricing arrangements apply to agricultural commodities which are export oriented, export parity is the appropriate benchmark or unassisted price for measuring assistance. This is on the basis that if the existing arrangements were removed and competitive conditions applied to the domestic market, diversion of sales between domestic and export markets would tend to equalise domestic and export prices at a comparable point-of-sale for products of comparable quality.

Domestic pricing arrangements often operate on agricultural commodities at the processed product stage. For products where the degree of processing required is considerable (eg, dairy products), it is likely that a proportion of the total assistance derived from domestic pricing arrangements accrues to the processing activity. Consequently, while assistance to the combined activities may be estimated with some certainty, the estimation of the assistance to the agricultural activity requires the assistance accorded the processing activity to be deducted from the gross producer transfers obtained from comparing domestic and export prices for the processed agricultural product.

This may be arbitrary and the greater is the assistance allocated to the agricultural activity, the lower will be the effective assistance afforded the food processing activity and vice-versa. For the majority of agricultural commodities subject to domestic pricing arrangements, however, processing is relatively minor, and little error may be involved if the total assistance from such arrangements is allocated to the agricultural activity.

#### ..Local content schemes

Under local content schemes, the Government assists an industry on the condition that the industry uses a certain proportion of locally sourced inputs in its production processes. This has the effect of expanding the market for locally produced inputs.

Local content schemes are normally used to redistribute part of the assistance provided to producers of final goods back to component suppliers. They benefit local component producers by imposing a cost burden on local producers of the final goods, equal to the difference between the cost of locally produced components and the world price of the same volume of components. Consequently, whilst local content schemes are a form of assistance afforded the output of local component manufacturers, they can reduce the ERA to the production of final goods.

The price effects of local content schemes can usually be estimated only by using direct price comparisons.

## SEVEN

### QUESTIONS AND ANSWERS ABOUT THE ERA

1: Why is the ERA needed to assist in the Uruguay Round Negotiations?

GATT negotiations are simply not working in the way that they should if the ambitious goals of the Uruguay Round are to be achieved. The ERA can help to change that by providing a means of assessing the progress made towards those goals.

The negotiating rounds of the past forty years have achieved large reductions in the tariffs of many Contracting Parties (CPs). But those same tariff reductions have been offset by resort to less visible non-tariff measures (see the pamphlet "Measuring the Impact of Trade Protection"). Those countries that further reduce their tariffs in the Uruguay Round can have no guarantee that the value of reciprocal offers will not be offset in the future by non-tariff measures.

Efforts to negotiate directly on the reduction of non-tariff measures - eg. in the 1982 Work Program - have foundered on the lack of any agreement on the identification of "legal" (and therefore "negotiable") NTMs and the assessment of the trade effect of those measures. The ERA proposal can help overcome this obstacle to the elimination of these measures.

It is important to note that the ERA does not distinguish between "legal" and "illegal" measures. It attempts to evaluate the effect of all measures which assist production. Because it takes no account of the "legality" of a measure the ERA neither adds to, nor detracts from the contention that "illegal" measures should be eliminated without negotiation.

The ERA could reveal, however, the reduction in market distortion that would result from the unilateral elimination of the measure. The benefits of reduced distortions to national investment and expenditure might add to the arguments for unilateral elimination.

2: Will the ERA take account of all measures applying to each product?

ERA calculations could, in principle, provide a framework for measuring all forms of assistance to production. In practice, however, there are some forms of assistance which are extremely difficult to measure with any accuracy, or if measured, difficult to regard as assistance (disassistance) to particular industries.

Where there is a variety of measures applying to a product and one or more of them is difficult to evaluate, the utility of attempting to do so must be decided on the basis of an assessment of the value of additional information.

If the calculations would show that an industry that is known to be highly assisted by certain easily evaluated measures (eg. tariffs on competing imports, subsidies on inputs) enjoys still higher assistance as a result of measures that are difficult to evaluate, then the precise value of this additional assistance may not be critical to ranking that industry.

The principal use of the ERA is to reveal relative rates of assistance and the direction and pace of change in those rates.

3: How can "comparability" between ERA calculations be assured?

It is not proposed that the ERA levels of each country would be directly compared with the ERA levels of its trading partners. The ERA is not generally determined with a precision that would warrant direct international comparisons.

Instead, it is proposed that all CPs would agree on a common methodology for the measurement of ERAs and that each country would calculate its own ERAs using that methodology. The results obtained on the first occasion would be compared with the results obtained in subsequent years to show the effect of (among other measures) agreements reached in the Uruguay Round on the levels of assistance to industry in each country.

For this purpose it would not be strictly necessary for individual countries to publish the "raw" ERA levels calculated for any year. It would be possible to show the pace and direction of change in industry assistance levels on the basis of an index in which the results obtained in the first year were given the value "100" and the results in subsequent years were adjusted to this benchmark. The only difficulty with such a

system, it is suggested, is that it lacks transparency.

Each country will wish to know that its trading partners have made an objective assessment of ERAs according to the agreed methodology.

One way of ensuring transparency would be to submit calculations to "audit" by the Secretariat and/or a group of experts on a schedule to be determined.

4: How long will it take to calculate the ERA?

On the first occasion it could a small team of people up to a year to calculate a set of ERAs for all sectors of an economy, depending on the availability of relevant data and the nature of commercial policies. For an economy where assistance to industry is chiefly in the form of tariffs on imports and subsidies or tax concessions and where relatively detailed industry data is collected by the national statistical agency, the calculations could be made in much less time.

Once the calculations have been made for a sector and the relevant data sets established, subsequent calculations for monitoring should be much easier.

5: Are there any "short cuts" which could make the calculations easier?

Yes. But there are trade-offs between the use of a short cut and the reliability of the measurement. It will be necessary to evaluate such trade-offs before adopting such methods as part of a common approach.

One of the most difficult aspects of the calculation of the ERA is the evaluation of certain measures using price comparisons. The large amount of data needed to evaluate the effect of eg. MFA quotas, or VETs on a particular electronic good, or "informal" restrictions on the distribution and warehousing of imports, can present problems. It may be necessary to use some short cuts to reduce the amount of data collected, for example, by arbitrarily defining some "representative" substitute products (the subject of the price comparisons) in each product category.

However in each of the examples mentioned the measures are frequently encountered in developed countries which are likely to have the most elaborate data collection

facilities and, presumably, have the greatest capacity to conduct full evaluations. Furthermore, in these product areas the protection is often "tailor-made" for specific domestic products and is aimed at specific imported substitutes for domestic production. In these cases the difficulty of determining the products whose domestic and world prices should be compared may be reduced.

6: Will the ERA be calculated for all products in all sectors?

The more complete the coverage of the calculations the more valuable the ERA data will be for domestic purposes and in the negotiations.

This is not to say that a comprehensive approach must be adopted from the start by any country which has not previously had experience with the calculation of the ERA. In Australia's case comprehensive calculations of effective rates of assistance to the agricultural sector - which is typically less assisted than the manufacturing sector - did not begin until the early 1980s.

7: Who would calculate the ERA?

Each CP would be responsible for the calculation of its own ERAs. The nature of the data needed for the calculation and the amount of data that might be needed makes it impractical to centralise the calculation of the ERA.

For example, in most cases the calculation of the ERA for a particular product group will require the calculation of unassisted value added using manufacturers' sales and costs data (ex-factory sales of individual products and actual costs of individual inputs) which is made available to the national statistical agency on a confidential basis.

Where price comparisons are needed to estimate the price effect of a measure such as a quota it would not be feasible for an international agency to undertake the detailed work required.

8: Are all CPs likely to have the facilities for these calculations?

Most CPs already collect industry sales and costs data relevant to ERA calculations for the purposes of their national accounts. Typically, the national statistical agency conducts industry censuses and surveys to determine industry sales, costs and value added, although in LDCs these surveys may be restricted to the external sector. This same data is used in Australia to determine the unassisted value-added of each industry.

A second step in the calculation of the ERA requires the use of a concordance between the industry classifications used to collect sales and cost data and the customs/tariff classifications used to identify imports of the same product or its substitute. Many countries will have constructed these concordances for other purposes and will be able to identify cif or ldf prices of competing imports in most import classifications.

The calculation of the ERA at an aggregate level is not inherently difficult once these data sources have been identified. The responsibility for the calculation could be appropriately given to an economic planning unit of government or even to an independent economic institution or consultant (as has been the case in some calculations commissioned by the IBRD)

Q: What does the level of effective assistance mean?

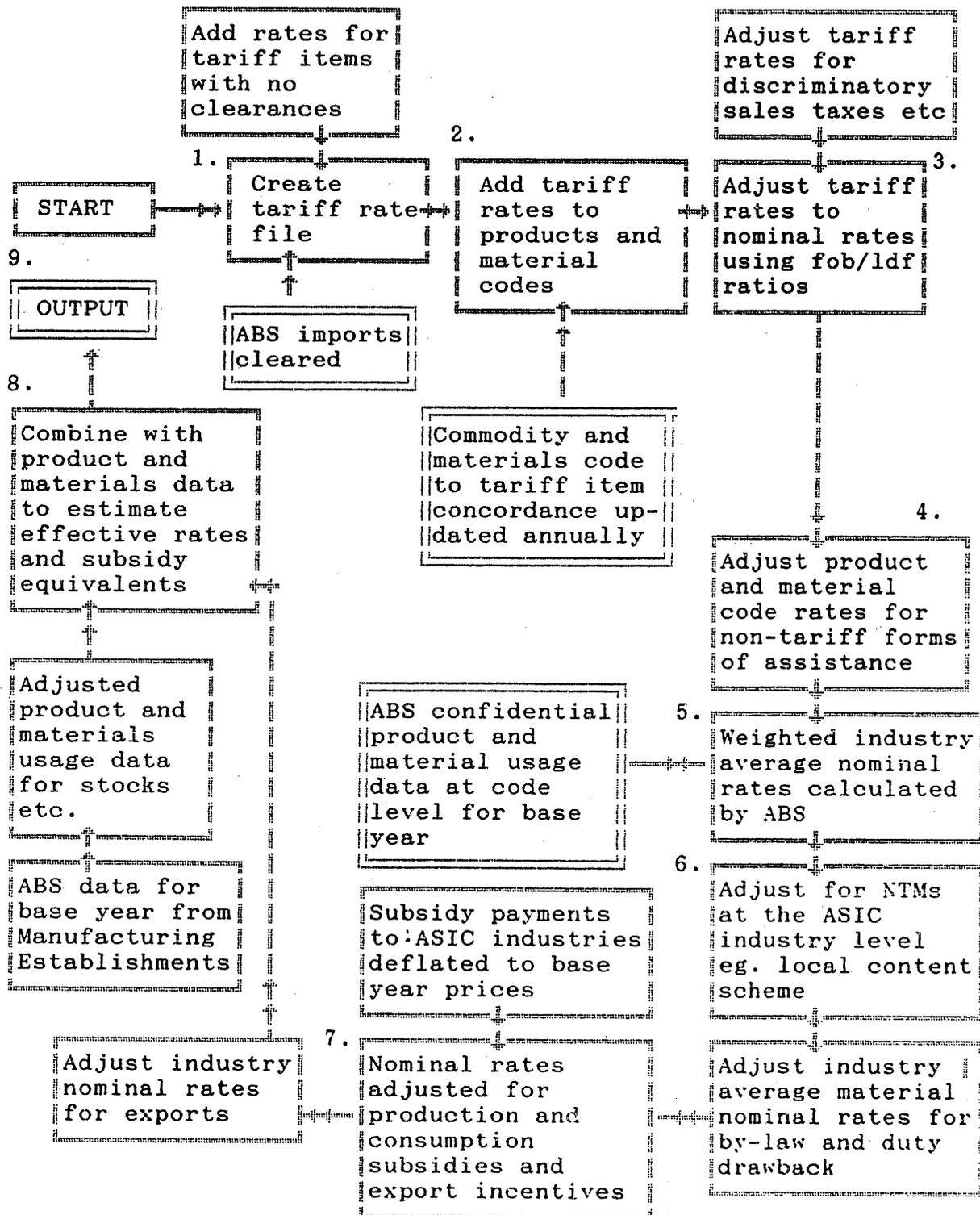
On its own an estimate of the effective rate of assistance shows the amount of assistance to production of a particular commodity due (usually) to specific government intervention. The ERA does not count "natural" advantages.

Although the ERA is usually expressed as a proportion of the unassisted value added of the product, it can be equivalently expressed as a dollar amount; the NSE. The Net Subsidy Equivalent is the sum of money that would have to be given to the producer to equal the assistance measured by the ERA. It is the Gross Subsidy Equivalent plus positive assistance to the industry for the purchase of intermediate inputs and use of value added factors (defined in recent OECD analyses of agricultural assistance policies as the Producer Subsidy Equivalent) in the industry, minus the penalties on input use such as tariffs and taxes.

The ERA for any industry must normally be interpreted in the context of assistance levels in other industries. It is often necessary to know where the highest net levels of assistance - and therefore the greatest production incentives - are being created by government programs. In order to view this assistance as a producer would, it is important to net out of the gross subsidy effect any penalties that are due to assistance to input industries.

A structure of government intervention that provides widely different levels of assistance to different industries is likely to distort national patterns of production more or less severely; probably at high cost to the consumer and the taxpayer and to the economy as a whole in the long run. High levels of assistance are also associated - almost by definition - with distortions to international trade.

EIGHT  
ERA CALCULATION FLOWCHART



## NOTES ON THE FLOW CHART

### STEP 1

Tariff rate file created from the Customs Schedule which records the General rates of duty for all 7-digit (8-digit under the Harmonised tariff) tariff items operating throughout the year. It records rate changes as well as 'deaths and births' of tariff items and the month of these changes.

Duty rates on the tariff rate file exclude the excise component of the tariff for goods excisable if produced locally (mainly beer and spirits, tobacco products and petroleum products). That is, only the protective margin of the tariff is included. The total rate (base duty plus quota rents) is recorded for goods (passenger motor vehicles and clothing and footwear) subject to import quotas. For rates containing a specific component ad valorem rates are calculated from ABS import data by dividing duty paid on general sourced imports by their fob value.

### STEP 2

A concordance is constructed between significant output and material codes used by ABS to collect manufacturing census data for ASIC industries and the Customs schedule used to set tariffs on competing imports. This involves a matching of ABS commodity code descriptions with the 7-digit (or 8-digit) tariff item descriptions to ensure that significant items are included in the concordance. Weights (based on domestic production patterns for output and usage patterns for material codes and not on imports) need to be assigned for most codes as more than one tariff item will usually be relevant.

The concordance is continually updated using tariff histories.

### STEP 3

Tariff rates (fob based) are converted to nominal rate (ldf based) equivalents using file of fob/cif ratios at the tariff item level supplied by ABS.

### STEP 4

Override duty rates at the commodity code level to take account of such factors as:

- .differential sales tax (beer)
- .exported goods
- .non-traded goods
- .excisable materials (mainly petroleum products)
- .certain agricultural pricing arrangements

### STEP 5

Because data on the value of production and material usage at the code level is confidential under Australian law, nominal rates derived by the IAC for each code are weighted annually by the ABS

to derive average nominal rates at each industry (4-digit ASIC) level. To do this, magnetic tapes containing both nominal rates for product and material codes are sent to the ABS by the Commission. Weighted average nominal rates for products and materials at ASIC industry level calculated by the ABS are returned to the IAC on magnetic tapes.

#### STEP 6

Certain agricultural pricing arrangements (eg. dairying) and the local content arrangements applying to motor vehicles cannot be applied to the system at Step 4 at the commodity code level and are entered as overrides at the ASIC industry level.

#### STEP 7

Aggregate data on production bounties and export incentives are available each year from the Budget papers. These payments are allocated to ASIC industries by IAC staff and deflated by Articles produced indexes to base year prices.

#### STEP 8

Data on value of production and materials used for each ASIC industry for the base year is taken from the ABS publication "Manufacturing Establishments: Details of Operations by Industry Class, Australia". 'Sales and transfers out' of an industry's production is considered to be the best measure of an industry's output for the purposes of the study. However, in order to relate this output to the value of materials used (and value added) of an industry, certain adjustments are necessary. Allowance is made for changes in the value of stocks of finished goods, for revenue derived from repair work, and for work done on commission.

For the value of materials used, the most appropriate statistic is considered to be: 'total usage of materials etc. electricity and fuels; and containers etc.' Again, some adjustments are made to the values published by the ABS; in particular, allowance has been made for changes in the values of work-in-progress and for the values of materials supplied on commission by other establishments.

Data on output and materials used by ASIC industries is only changed every 4-5 years when the base year used in the study is up-dated.

#### STEP 9

Output of the system comprises nominal and effective rates, subsidy equivalents and consumer tax equivalents at the 4, 3 and 2-digit ASIC level.

1. See "Measuring the Impact of Trade Protection", Australian Department of Foreign Affairs and Trade, 1988: Chart 3.

2. Materials will also include service inputs where these have been excluded from the activity's value added.

3. This is the approach suggested by Corden whereby service inputs are decomposed backwards into a tradeable materials component and value added by primary factors. See Corden, W.M.: *The Theory of Protection*, Clarendon Press, Oxford, 1971, pp. 157 - 163.

4. See for example Bela Balassa and Associates: *Development Strategies in Semi Industrial Economies*, World Bank Research Publications, The Johns Hopkins University Press, 1982.

5. Unless the tariff rate is sufficiently high to prohibit imports the available tariff can generally be regarded as fully used.

6. Import licenses set an absolute limit on the number or value of items which may enter the economy during a fixed period. Tariff quotas do not set absolute limits on entry, but impose a high penalty tariff rate on imports above a specified amount. Quantitative restrictions can be global and applied to certain imports from all countries (as in the case of Australia) or applied to certain imports from specified countries. Where country quotas are applied against imports from competitive countries, they can assist domestic industries in the same way as global quotas.

7. For an Australian analysis of this point, see IAC, Annual Report 1980 - 81, AGPS, Canberra, Australia: Appendix 1.6.

8. For details of the formula and data sources that have been used in Australian surveys, see both IAC, Textiles, Clothing and Footwear, Part A: General (Report No. 240), AGPS, Canberra, Australia, 1980: Appendix 5.1; and Draft Report on Passenger Motor Vehicles and Components - Post 1984 Assistance Arrangements, 1981, App. 9.

---

## SELECT BIBLIOGRAPHY

---

- Anderson, J.E., "General Equilibrium and the Effective Rate of Protection", *Journal of Political Economy*, 78, July 1970.
- Balassa, B., "Tariff Protection in Industrial Countries: An Evaluation", *Journal of Political Economy*, 73, Dec. 1965, pp. 573-94.
- et al, *The Structure of Protection in Developing Countries*, New York, Johns Hopkins.
- et al, *Development Strategies in Semi-industrial Economies*, World Bank 1982.
- Baldwin, R.E., *Nontariff Distortions of International Trade*, Washington D.C., The Brookings Institute, 1970.
- Barber, C.L., "Canadian Tariff Policy", *Canadian Journal of Economics and Political Science*, 22 Nov. 1955, pp. 513-30.
- Basevi, G., "The US Tariff Structure: Estimates of Effective Rates of Protection of US Industries and Industrial Labour", *Review of Economics and Statistics*, 48, May 1966, pp. 259-82.
- Corden, W.M. "The Structure of a Tariff System and the Effective Protective Rate", *Journal of Political Economy*, 74, June 1966, pp. 221-37.
- "The Effective Protective Rate, the Uniform Tariff Equivalent and the Average Tariff", *Economic Record*, 42, June 1966, pp.200-16.
- "Effective Protective Rates in the General Equilibrium Model: A Geometric Note", *Oxford Economic Papers*, 21, July 1969, pp. 135-41.
- The Theory of Protection*, Oxford, Oxford University Press, 1971.
- Trade Policy and Economic Welfare*, Oxford, Clarendon Press, 1974.
- Findlay, C. and Garnaut, R., *The Political Economy of Manufacturing Protection: Experiences of ASEAN and Australia*, Sydney, Allen and Unwin, 1986.
- Findlay, R. "Comparative Advantage, Effective Protection and the Domestic Resource Cost of Foreign Exchange.", *Journal of International Economics*, 1, 1971.
- Finger, J.M. "Substitution and the Effective Rate of Protection", *Journal of Political Economy*, 78, Nov. 1969.
- Grubel, H.G. and Johnson, H.G., *Effective Tariff Protection*, Geneva, 1971.
- Hamilton, C., "Voluntary Export Restraints on Clothing from Asia: Tariff Equivalents, Rent Income and Trade Barrier Formation", *Weltwirtschaftliches Archiv*, 120, 1984.
- Humphrey, D.B., "Measuring the Effective Rate of Protection: Direct and Indirect Effects", *Journal of Political Economy*, 77, Sept. 1969, pp. 834-44.
- Industries Assistance Commission (Australia), *Assistance to Manufacturing Industries in Australia, 1968-69 to 1973-74*, Canberra, AGPS, 1976.
- Assistance to Agricultural and Manufacturing Industries*, Canberra AGPS, 1987.
- Assistance to Mining: Some Issues and Preliminary Analysis*, Canberra, AGPS, 1988.
- Johnson, H.G., "The Theory of Tariff Structure, with Special Reference to World Trade and Development", in Johnson, H.G. and Kenen, P.B., *Trade and Development*, Geneva 1965.
- "A Model of Protection and the Exchange Rate", *Review of Economic Studies*, 33, April 1966, pp. 159-63.
- "The Theory of Effective Protection and Preferences," *Economica*, 36, May 1969, pp. 119-38.
- "Effective Protection and General Equilibrium Theory," in Johnson, H.G., *Aspects of the Theory of Tariffs*, London, Allen and Unwin, 1971.
- Jones, R.W., "Effective Protection and Substitution", *Journal of International Economics*, 1, Dec. 1971, pp. 59-82.
- Kate, A.T., and Wallace, R.B., *Protection and Economic Development in Mexico*, Guildford, Biddles, 1980.
- Motha, G. and Plunkett, H., "The Effective Rate of Protection - An Investigation into the Application of the Concept to the Australian Rural Sector", *Quarterly Review of Agricultural Economics*, V.XXV11, No.3, July 1974, pp. 124-134.
- Ray A. "Non-traded Inputs and Effective Protection: A General Equilibrium Analysis", *Journal of International Economics*, 3, August, 1973, pp. 245-258.
- Ruffin, R J., "Tariffs, Intermediate Goods and Domestic Production", *American Economic Review*, 59, June 1969, pp. 261-69.