THE CONCEPT OF COST OF PRODUCTION IN

AUSTRALIAN AGRICULTURAL POLICY

WITH SPECIFIC APPLICATION TO

THE WHEAT INDUSTRY

Thesis submitted for
degree of Master of Economics

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by

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DECLARATION

This is to certify that I have acknowledged all the sources of the thesis and that the thesis is my own composition.

Signed

Witness

7th October, 1965.
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THE CONCEPT OF COST OF PRODUCTION IN AUSTRALIAN AGRICULTURAL POLICY - WITH SPECIFIC APPLICATION TO THE WHEAT INDUSTRY

Introduction

One feature of Australian agricultural policy in the post World War II era has been the introduction of cost-based price stabilization schemes for certain of our rural industries.

Currently there are four such stabilization schemes under which the price of the industry's product is related to costs of production. The products involved are wheat, butterfat (for butter and cheese production), sugar and dried vine fruits.

The Wheat Industry

The first wheat industry stabilization scheme under peacetime arrangements commenced with the 1948-49 season and ran for five years: second, third and fourth stabilization schemes, each of five years duration, which have continued the policy of basing prices on assessed cost of production in respect of home consumption and a specified quantity of exports, have since been enacted. The present (fourth) scheme will terminate with the 1967-68 season.

The main features of the current scheme are as follows:

1. the Australian Wheat Board is constituted as the sole authority for the marketing of wheat within Australia and for the marketing of wheat and flour for export from Australia.
2. the price of wheat is guaranteed, the guarantee covering wheat consumed locally plus 150 million bushels of export wheat.
3. the guaranteed price for 1963-64 was set at 14/5d. per bushel bulk basis f.o.r. ports which is to be adjusted
in succeeding years according to movements in production costs.

- A stabilization fund was created into which growers contribute towards the financing of the guaranteed price, are paid. For this purpose funds are collected by means of an export tax equal to the excess of export returns over the guaranteed return up to a maximum of 1/6d. per bushel. A ceiling of £30 million is set on growers' contributions to this fund.

- The home consumption price of wheat is fixed by State legislation and is based on the guaranteed price.

- A loading on the price of all wheat sold for consumption in Australia is made to cover the cost of transporting wheat from the Mainland to Tasmania each season. The present loading is 2d. a bushel.

- A premium on wheat exported from Western Australia is payable to producers in recognition of the freight advantage to overseas markets enjoyed by producers in that State. The premium is based on the actual freight advantage up to a maximum of 3d. a bushel.

**The Dairy Industry**

To encourage an expansion of production of dairy produce during the last war, the Commonwealth Government introduced a system under which the producer was guaranteed a price based on production costs for all milk used in manufacturing. This system which was accompanied by subsidies and price control was subsequently expanded into the first five year stabilization scheme.

In this scheme which commenced in 1947, the guaranteed price in respect of the commercial butter equivalent of butter, cheese and processed milk was fixed on the basis of assessed cost of production.
In the second five-year scheme, which began in 1952, the price guarantee was related to a proportion of butter and cheese production which was determined on the basis of the level of home consumption each year plus 20% of this level. Provision was also made under this scheme for the establishment of an independent body to advise the Government on the guaranteed price. Under its terms of reference, this body (the Dairy Industry Investigation Committee) was to take demand as well as cost considerations into account (a reflection of growing concern at the resistance of domestic consumers to increased prices). In 1955/56 the Government introduced the principle of a fixed amount of subsidy which in that year was set at £14.5 million. In the following year it was set at £13.5 million and it has remained at this level ever since.

The third five-year stabilization scheme had the same basic features as its predecessor. In the fourth (and current) scheme, however, the Government has handed the responsibility for price fixation on the domestic market back to the dairy industry but continues to assess movements in industry costs of production for the industry's use as a guide to the fixation of domestic prices.

In 1948-49 a dairy industry stabilization fund was established into which amounts realized on butter and cheese exports in excess of the f.o.b. equivalent of the guaranteed ex-factory prices were paid.

Payments into the Fund were made in each season up to 1950-51 and in June 1951 the balance stood at £3.9 million. In the 1951-52 season the deficiency on exports of both butter and cheese was covered by payments from the Fund, the balance at June 1952 being reduced to £2.9 million. From
1952-53 onwards, although export prices of butter and cheese were below the guaranteed prices, the Fund was only drawn on to increase the average equalisation rate for cheese in the seasons up to and including 1953-54 and for butter in respect of the 1954-55 season. In 1957 new legislation empowered the Board to use the Fund for any other purpose approved by the Minister. The balance in the Fund in June 1963 amounted to £2.2 million.

It will be evident from this that the Fund has not paid an important role in stabilizing returns to producers.

The Sugar Industry

For many years the production of cane sugar in Australia has been strictly controlled. This has been made necessary by the specific quota provisions of the International Sugar Agreement, to which Australia has been a signatory, limiting exports from members countries.

On the domestic market the price of refined sugar is fixed in relation to the cost of production of sugarcane and milling costs.

On the export market a considerable proportion of Australian sugar is sold under the terms of the Commonwealth Sugar Agreement on the basis of annually negotiated prices. Over a period of years these prices have been very favourable.

When the Australian price of sugar is higher than the world ruling price, Australian exporters of products containing sugar, e.g. jams, canned fruits, condensed milk, etc. are granted a rebate on the cane sugar content of products exported. This is done to remove the price disadvantage suffered by Australian processors. The rate of the rebate is the excess, if any, of the Australian sugar price over the
estimated cost of the cheapest available foreign sugar landed, duty free, in Australia.

A domestic sugar rebate of £2.4.0 per ton is paid on the cane sugar content of approved fruit products manufactured in Australia irrespective of whether the products are for home consumption or for export. The rebate is designed to assist the manufactured fruits industry and is payable only where manufacturers pay not less than established minimum prices for their fruit. The domestic sugar rebate is deducted from any export rebate if the approved fruit products are subsequently exported.

The Dried Vine Fruits Industry

A five year stabilization scheme for the dried vine fruits industry was introduced in 1964.

Under this scheme -
- contributions are made by growers into a separate fund for each variety when average realisations of domestic and export sales exceed the assessed cost of production by £5 per ton subject to a limit on contributions of £10 per ton.
- the quantities guaranteed in each season are: 75,000 tons of sultanas, 13,500 tons of currants and 11,000 tons of raisins.
- payments are not made by growers into the funds, irrespective of average realisations, if a season's production does not exceed 50,000 tons of sultanas, 8,000 tons of currants or 6,000 tons of raisins - a provision designed to meet the situation where overall industry returns are low.
- where a particular stabilization fund is without adequate funds or has no funds at all, the Commonwealth
has agreed to contribute whatever funds are necessary to raise average returns to £5 per ton below costs of production. However, if industry contributions subsequently raise the funds above the limits of £500,000 for currants and raisins and £2,000,000 for sultanas, the Commonwealth would first be reimbursed, to the extent that funds were available, contributions previously made by it.

As average production of dried vine fruits in the ten year period ending 1963 averaged 60,600 tons in respect of sultanas, 10,500 tons in respect of currants and 8,000 tons in respect of raisins, all or a large proportion of each crop is likely to come within the terms of the guarantee.

Each of the abovementioned schemes it will be seen has its own special features tailored to its industry's particular circumstances. For this reason the consideration of cost-based pricing policy in Australian agriculture is more appropriately attempted on an industry-by-industry basis. Accordingly, in this paper, attention will be concentrated on one industry, namely, the wheat industry.

Part I will be devoted to a discussion of the policy and its effects and Part II to an appraisal of the concepts and methodology employed in assessing the cost of production of wheat for the purpose of determining guaranteed prices. In this latter context we shall need to establish whether a genuine cost figure is in fact being assessed and whether it is consistent with the policy objective.

Appendix I sets out the assessed cost figures in respect of the first three wheat industry stabilization schemes and in Appendix II the method by which the base cost and base cost structure for a stabilization scheme is derived from basic survey data, is demonstrated.
PART I APPRAISAL OF WHEAT STABILIZATION POLICY

Evolution of Policy

The introduction of wheat price stabilization after the second world war may well be regarded as a consequence of the disastrous financial experiences of wheat-growers in the 1930's.

In the previous decade the industry had expanded steadily under the influence of land settlement schemes for soldiers, migrants and others by State Governments and in the economic crisis of 1929-30 farmers were urged to increase their acreages in an endeavour to sustain foreign currency earnings. However in 1930-31 world wheat prices collapsed falling to less than half of the average prices ruling in the second half of the 1920's. The fall in price is indicated in the following table.

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Source: C.B.C.S.

The effect on wheat growers was catastrophic. During the expansion of the 1920's when acreage increased from 9.1m. acres to 15.0m. acres in 1929-30 and to 18.2m. acres in the following year, large amounts of capital were borrowed. Credit was easy, debts were high, the evidence indicating extravagant expenditure on machinery equipment.
and high priced land. Only the very prudent remained free of substantial debt.\(^{(1)}\)

It will be seen from the above table that the weakening trend in prices evident towards the end of the 1920's turned into a collapse in 1931 with no real recovery in the ensuing years. There was a partial recovery in the mid 1930's but this was not sustained and in the immediate pre-war period prices were again weakened badly and further emergency assistance was extended to growers.

The Royal Commission set up to enquire into and report on the Wheat, Flour and Bread Industries indicated, in its first report, that the industry was in a serious financial position and that wheat growing was unprofitable at the prices ruling in the 1930's. The Commission recommended emergency measures for the adjustment of wheat growers' debts and the adoption of a stable home consumption price for wheat by means of an excise tax on flour exports.

In its second report the Commission made the following observations.

- The Australian wheat problem is merely part of a great world problem which affects all kinds of agricultural production and has rapidly and radically changed the economic outlook for more than 70% of producers in the world.

- It is impossible for an industry to experience such a reverse without undergoing severe strain, and the social system of primary producing countries cannot be expected to endure indefinitely the consequent economic distress;

- there was a serious gap between cost of production and (then) current prices;

- the progressive submergence of rural producers under accumulating debts, constitutes a political problem of the first order in every wheat exporting country;

\(^{(1)}\) First Report of Royal Commission on Wheat, Flour and Bread Industries.
constructive planning to save a grave situation has become increasingly urgent in every country which relies on the exports of primary commodities.

The Commission considered that the broad lines of action for future wheat policy should be:

1. Maximum Australian contribution to revive international trade;
2. Review of costs including debts and interest to establish the extent of relief required;
3. Agricultural re-organization, efficient farming practices, avoidance of increased average production;

As regards international agreements the Commission noted that many devices had been introduced to alleviate the burden of depressed prices (e.g. import quotas, production control, increased tariffs, bounties and exchange control) but pointed out that these had had adverse effects via diminished trade on the problems of exporters.

The Commission concluded that abnormal stocks were the immediate cause of the collapse in wheat prices, accentuated by the bounteous harvest of 1928. It also noted that the principle of protecting the home producer of primary products from export price fluctuations has been adopted as a cardinal point of policy in many countries and that this had resulted in an expansion of production.

Indicative of the widespread nature of the economic reverses of wheatgrowers is reflected in the fact that in the two years 1930 and 1931 sixteen international conferences dealing primarily with wheat or having wheat as a principal matter were held. These were followed by a world Economic Conference in 1933.

(1) Second Report of Royal Commission Wheat, Flour and Bread Industries.
Referring to the gravity of the growers' financial position, Dunsdorf\(^{(1)}\) indicated that half of their income (excluding bounties) had to be paid to creditors the remainder giving farmers an income equal to \(47\%\) of an agricultural labourer's wage and nothing for interest on equity.

Whilst the second world war rescued farmers from a deepening recession the long years of economic crises in the 1930's were not to be forgotten and soon after the war ended the Australian Wheat Growers Federation at its 1946 Conference passed the following resolution:

"That the Federal Government set up a commission of enquiry on which the wheatgrowers shall have adequate representation, to ascertain the cost of producing a bushel of wheat. The figures to be indexed in a similar manner to the index used in the cost of living figures. The guaranteed floor price to be the cost of production as determined by the commission with provision for a review every year to relate the price to any rise or fall in the cost of production".

Nor did the Government have any illusions about future prospects for trade in Wheat. Thus in a statement of current Commonwealth policy on agriculture the Prime Minister of Australia, in 1946, indicated that the good prices of 1946 were expected to be very temporary. This degree of pessimism would seem to have been strongly influenced by recollections of the post-world war I recession in prices and the position of oversupply in the 1930's.

In the same statement the Prime Minister laid down the objective of agricultural policy. The first of the general objectives was "to raise and make more secure the levels of living enjoyed by those engaged in and dependent upon the primary industries" and in more specific terms the policy aimed, inter alia, "to provide greater flexibility and security of farmers' incomes". By this the government indicated that welfare objectives were to be an integral part of agricultural policy.

\(^{(1)}\) J.B. Chifley: A Rural Policy for Post-war Australia.
In view of this statement of policy it was not surprising that the proposal of the Wheatgrowers' Federation was sympathetically received. In due course the Government announced its approval and set up a Committee to inquire into and report upon:

(a) the reasonable costs of wheat production per bushel in the main wheatgrowing districts of the Commonwealth and,

(b) whether basic items of cost could be established as an index to periodical variations in the cost of production of wheat".

This Committee conducted a postal survey of wheat farms in respect of the five years ended 1946/47. The survey was followed by hearings of evidence from farmers who had completed the questionnaires, the purpose being to check the accuracy of the information. Subsequently the Committee reported that the average cost of growing wheat in the Commonwealth was 6/- per bushel at sidings and that measurement of movements in costs was possible using an index.

The Government however did not accept the Committee's findings in full and in January 1948 the Minister announced that from January 1948 to the conclusion of the 1951/52 wheat crop the Commonwealth Government would guarantee a price of 6/3 a bushel bulk f.o.r. ports for all wheat sold by the Australian Wheat Board for consumption within Australia and for all wheat exported.

The Minister referred to the Committee's cost finding as follows:

"The Committee found a cost figure of 6/- per bushel at sidings. Conversion of this price to a bulk f.o.r. ports basis indicated a price of 6/8d. per bushel. Having regard to the long range security provided and the profitable return to a reasonably efficient producer, the Government adopted 6/3d. per bushel f.o.r. ports as a fair proposition to all concerned".
At a conference in Canberra early in 1948 the Australian Wheat-growers Federation accepted the price of 6/3d. with the reservation that it should be subject to the application of an index number indicating a rise or fall in production costs.

In June 1948 the Commonwealth informed a conference of State Ministers of agriculture that the Commonwealth was prepared to guarantee 6/3d. a bushel on all export wheat plus any increase in the cost of production determined by an index.

Soon after this Conference the possibility arose that the International Wheat Agreement which with its guaranteed purchases within a defined range of prices provided a major supporting measure for the Governments' price guarantee to producers, might not be ratified. A further conference of State Ministers was then held.

It was agreed at this latter conference that the Commonwealth guarantee should apply to wheat used for home consumption in Australia and up to 100 million bushels of wheat exported. The Conference also agreed inter alia,

1. that the Commonwealth Government shall guarantee a price of 6/3d. a bushel f.o.r. ports bulk basis for wheat grown and delivered by wheat growers;
2. that the guaranteed price shall vary according to an index of production costs for each season staring with the 1948/49 crop; and
3. that the guarantee shall apply to the wheat crop marketed through approved organisations for the period up to the end of the 1952/53 season.

This agreement formed the basis of the Wheat Industry Stabilization Act 1948 and the complementary State legislation.
In introducing the Wheat Industry Stabilization Bill in the House of Representatives in October 1946, the Minister declared that the outstanding objective of the plan was "to ensure the wheatgrower against the serious hardships that comes from falls in the world's wheat price" and that "the movement in prices of wheat, or indeed, of any primary product, have little relation to changes in costs of production"(1).

The central feature of the plan he added "is that there will be a guaranteed price to growers based upon costs of production" which would be reviewed annually.(2)

The Minister went on to say that "There are too many factors affecting the growers' prosperity which are outside of growers' control that wheat growing has been too much of a gamble".

In discussing the notion of a home consumption price for wheat completely divorced from export prices the Minister said -

"Our domestic wheat price will not follow erratic export prices up and down the scale. That system ruined growers in the past, and gave no great benefit to consumers. A reasonable, stabilized price in the long run is a better policy. The principles behind the plan, therefore, is that our wheat growers are entitled to a fair return for the wheat they sell in Australia, and that, on the other hand, the Australian user should not be exploited. Allied to this is the principle that an important industry producing essential food, should be given reasonable security. Where the export marketing includes undue risk, it is justifiable for the community to give a guarantee to guard the industry against that risk."

(1) Hansard Vol. 198 1948 p1449
(2) " " " " " 
(3) " " " " p1451
Then years later the Minister for Primary Industry presented the Third Wheat Industry Stabilization Bill to Parliament which did not differ fundamentally from the schemes that preceded it. Certain changes in the cost formula were proposed, the one relating to yields having a downward influence on costs, the other relating to the valuation of land having an upward influence. The new legislative proposals also provided for a stabilization fund to be financed by growers up to a limit of £20 million beyond which refunds would be made on a first-in first-out basis.

In the fourth and current scheme, the cost formula was again modified to take into account the rising trend in average yields in the industry. This resulted in a sharp drop in the guaranteed price in 1963-64 but the industry had the satisfaction of having the guaranteed price extended to 150 million bushels of exports, instead of the 100 million bushels in the previous schemes. At the same time the limit of growers' contributions to the stabilization fund was raised to £30 million.

It is evident from the foregoing that the Government was determined to avoid future disruptive effects of widely fluctuating world wheat prices on the wheat producer. It is evident too that the Government intended to give effect to its policy of reasonable incomes through the medium of guaranteed cost-based wheat prices. This, it should be noted, is a welfare objective which cannot be reconciled with traditional price theory and which therefore involves a social cost to the community.

In this regard the Government was cautious about establishing stabilized prices based on assessed costs of production. This was indicated by its refusal to accept the wheat cost of Production Committee's recommendation for a guaranteed price of 6/8d. a bushel f.o.r. Further, in the Prime Ministers 1946 statement on agricultural policy, (page 8) he warned about the limitations of cost surveys and stated the
Governments' aim was to set a price level that would reasonably compensate efficient production. These attitudes were consistent with the findings of the Rural Reconstruction Commission which recognised that it was impossible by domestic policy alone to stabilize prices at a high level for the entire output of the principal export industries and that international collaboration was essential. The Commission did however support the view that a guaranteed home consumption price related to general economic conditions could be worked out to give a measure of stabilization even if there were no international stabilization but it did not favour rigid price guarantees.
Resource Allocation

In this sector we shall consider what constitutes equilibrium in product and factor markets, discuss the theory of rent in relation to resource allocation and the implications this has for a cost-based price guarantee, and consider to what extent misallocation of resources has occurred as a result of the guaranteed cost-based price in the wheat industry.

(a) **Conditions for Equilibrium in Product and Factor Markets.**

Under conditions of pure competition the price of a commodity is determined by demand and supply forces interacting upon each other. A price determined in this way is an equilibrium price; that is to say, it is one which will satisfy the existing conditions of demand and supply. Thus, if in one position of equilibrium, the conditions of either demand or supply change, the market price, as the equilibrating factor in the movement of demand and supply into a new position of market equilibrium, must also change. If, for example, supply increased relative to demand, the equilibrium price would, assuming the elasticity of demand was less than infinite, be lower than in the original situation; if on the other hand demand increased relative to supply the reverse would hold assuming an imperfectly elastic supply.

When market equilibrium is disturbed by a change in supply or demand conditions, supply and demand forces set up a movement towards a new permanent position of equilibrium in respect of those conditions. However, this movement cannot be achieved instantaneously; in fact, it may only be achieved over a long period of time. In the interim, the market takes up a series of temporary short term equilibrium positions.
As all short period equilibrium positions lack the same key characteristic of the long period, namely, complete adaptation of supply to changed demand conditions, it is usual for expositional purposes to refer to only one short period equilibrium position.

Short period equilibrium occurs when in response to, say, an increase in price all producers increase their output with their existing fixed resource supply until the marginal cost of each producer is equal to the market price of the product. When this condition is satisfied the volume of supply will equal the volume of demand.

This state of equilibrium is not, however, a permanent one since producers have not achieved the position at which they maximize their profits. Only after sufficient time has elapsed for supply conditions (factor markets) to fully adapt to the new demand conditions will they reach their long period equilibrium position where profits are maximized. This will occur where the marginal cost and average cost of each producer is equated with price.

This equilibrium position necessarily implies that the prices of each resource used in the production process are themselves equilibrium prices. This can only occur when the marginal rate of substitution of one factor for another is equal between producing units i.e. a producer will increase his hire of each resource up to the point where the last increment of a value-unit of one resource adds to his product an amount equal to the marginal revenue product of a value-unit of each other resource.

Industry equilibrium is therefore only achieved when the conditions for equilibrium in both product and factor markets have been satisfied.

When the price of a product, say, falls, the demand for resources used in production of that product will, cet. par,
be reduced; this will cause the prices of the resources to decline, the effect on the price of each resource depending upon its respective elasticities of supply and demand which in turn are affected by its elasticity of substitution. Changes in prices of products are thus translated into changes in incomes to factors.

It will therefore be apparent that given an arbitrarily fixed price for the product of an industry, which is higher than the free market price of that product, the incomes of one or more factors engaged in that industry will be equal to the marginal value productivity of these factors in other industries and therefore in excess of its or their theoretical earnings in that industry under free market conditions. Moreover, the marginal revenue productivity of each factor in the industry would be less than the marginal revenue productivity of resources employed in other industry and thus the resources would contribute less to aggregate national product than they would if they were employed in these other industries. Resources are not therefore allocated in the most efficient manner.

Fixing prices above their free market level not only results in lower total product because of the misallocation of resources, it also removes the income incentive for resources to move into industries where their marginal revenue productivity is maximized thereby tending to create a permanent structural fault in the economy.

In the opposite situation where the fixed price of a product is below its market price, production will be carried to the point where the marginal value productivity of each resource is the same as in other industries. This will represent a lower level of production than would result if market prices prevailed for the reason that with the higher price rents would appear and the marginal revenue productivity would rise above the marginal value productivity of resources
in other industries so that for a time each new resource entering the industry (as well as existing resources in the industry) would contribute more to total product than is lost by its withdrawal from other industry.

Although, in the following section, we shall consider in more detail the part rent plays in the allocation of resources and its significance in terms of cost based prices, it will be already clear that with arbitrarily fixed prices the allocation of resources through the supply responses of factors to these fixed product prices will not be carried to the point at which total production is maximized and the resulting loss in production is the social cost to the community resulting from its failure to allocate its resources in the most efficient manner.
(b) **Theory of Rent**

If the price of a product is to be fixed on the basis of its unit cost of production, it is essential that the price fixer should have a proper appreciation of the relationship of rent to cost. Moreover such a policy of interference with the price mechanism in agriculture has very important implications with respect to the allocation of resources. In the following discussion we shall, inter alia, see how rents act as an allocative force attracting resources into or away from a particular industry according as the demand for the product of that industry increases or decreases.

The theory of rent, which in its development by the classical school, was identified solely with payments for the use of land, has now been developed into a generalized theory with application and relevance to any factor of production in imperfectly elastic supply.

Stonier and Hague define rent in the following terms:

Rent can therefore be defined, more accurately than we have done so far, as the difference between the reward to any factor of production in imperfectly elastic supply with respect to changes in its prices and its transfer earnings (1). Rent may therefore be earned by labour, capital and enterprise (entrepreneurial earnings). In general, rents of labour and capital have a characteristic feature which is much less common to land and enterprise. This is that the rents are normally earned only in the short term and tend to disappear in the long run, when the supply of the factor has had time to respond to an increase in demand for its services.

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Another feature in the development of rent theory was that earlier notions that payment of rent is simply a transfer of an unearned surplus which is not necessary to induce the supply of a factor of production (land) have been supplemented by the recognition that rent provides motivation for the allocation of resources and, in the case of entrepreneurial rent, is highly significant as a motivational force for the organization of production. (1)

From the point of view of any one agricultural producer, the full charge (rent) for hiring land must be paid, i.e., his earnings must cover it, if he is to remain in production. Rent is not an unearned surplus to the individual producer. Even if a producer purchased instead of renting land, he would still have to pay the equivalent of rent in another form, i.e. the cost of interest on the money borrowed to purchase the land, or alternatively, if he purchased the land with his own money, he would have to forego the interest his money previously earned. However to the extent that the value of land increased beyond what the producer paid for it, his rental outlays (costs) would be less than his rental earnings.

The lower limit on rental payments (or their imputed equivalents) is set by the transfer earnings of the land, i.e. the earnings of the land in its next most profitable activity, for otherwise it would be more profitable to transfer the use of the land to this activity. The upper limit on rental payments depends on the price of the product being produced on the land in question.

From the point of view of the industry, the transfer earnings of land are an inescapable cost which must be met if the land is to remain in the industry and only the difference between the actual hiring charge and these transfer earnings is in the nature of rent i.e.

solely dependent on the price of the product being produced. As indicated later, payment of this 'surplus' is not necessary to keep resources in the industry but it acts as an allocative force attracting additional resources into the industry.

From the point of view of the economy as a whole, rent is not a cost; it is a differential return, a result of price and not a factor determining price; transfer earnings are zero.

Ricardo held that land rent was not a factor cost but was determined by commodity prices and was simply a transfer of an unearned surplus deriving from the use of the original and indestructible powers of the soil (on intra-marginal land). Except insofar as there is a quasi rental component of land rent this thesis still has general acceptance from the point of view of the economy as a whole.

**Land Rent**

There can be as many as three distinct elements in a payment for the rent of land: a scarcity rent component, a differential rent component, and a quasi-rent component.

Scarcity rent designates the payment made for the use of a factor in imperfectly elastic supply. Differential rent is the payment made in respect of the differential fertility of non-homogeneous units of land. These distinctions have little real value in practice since, as Marshall noted, "In a sense all rents are scarcity rents, and all rents are differential rents" (1). Both of these rents would qualify for Ricardo's definition of rent as a payment for the original and indestructible powers of the soil.

The quasi rent component of land rent, however,

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(1) A. Marshall: Principles of Economics, 8th ED, p. 422.
does have a higher order of significance for clearly its size will effect farmers' decisions on the matter of applications of labour and capital to the land for the purpose of effecting further improvements and for maintaining the existing improvements to the soil. If the value of land were in fact mainly due to past applications of labour and capital, then the rental earnings in respect of this investment would clearly influence future decisions on re-investment and/or new investment in land improvements. The truth of the matter is, however, shrouded in conjecture.

According to Keiper (1), Professor F.A. Knight writing in 1933, took the view that the original value of the soil is not important in relation to rent:

It will be clear, however, that the really original and indestructible qualities of the soil are limited in number, and their value is inseparably bound up with the value of qualities which are the result of expenditure of labour and capital in the past. More careful investigation will raise doubt as to whether the total cost of what is called land value is in excess of the total expenditure upon natural resources in the past. It is largely, if not altogether, fallacious to regard land as an unproduced good.

Australian experience lends support to this notion. Even at this time when land rents are relatively high, the value of our uncleared virgin land (e.g. Brigalow), especially if heavily timbered, is small in relation to the improved value of the land when it has been established as a farm.

Wadham and Wood (2) indicated quite clearly the

(1) op. cit., pl12
great and sometimes enormous difficulties associated with farming development in Australia. In the wheat industry special equipment had to be developed for sowing and harvesting on low yielding soils, phosphatic deficiencies had to be overcome, special machinery was needed to deal with rocks and stumps of original vegetation, new crop varieties had to be developed to suit the climate. In the dairy industry clearing proved an enormous problem and it was not until the development of refrigeration machinery, the cream separator, the Babcock testing machine and the coming of the railways that the industry's outlook was greatly altered. Thus, if we think of the production process as ending in the market into which the commodity produced is offered for sale, as indeed we are perfectly justified in doing, then it is obvious that labour and capital (technology) played an overwhelmingly important part in the productive process in early Australian agricultural development.

Although land values were very low in the early phases of our agricultural development, values subsequently rose quite considerably (1).

The question arises whether these increases in value (rents) are properly attributable to the original powers of the soil. According to the marginal productivity theory of distribution, the share of factors in the value product will depend on the marginal physical product of each factor, the equilibrium position being determined by the law of equi-marginal productivity: that is to say, units of one factor will be substituted for units of another, until the marginal value-unit of any one factor contributes to output an amount equal to the marginal revenue product of a value-unit of any other factor.

(1) Wadham & Wood ibid p.30 footnote 11
The application of this theory is, however, limited by our classification of factors of production: we think of land as a single factor of production, whereas in point of fact we are mainly dealing with highly developed land which owes some if not most of its value to past applications of labour and capital which can no longer be distinguished from the value of the land itself. We are therefore left with the conclusion that the rent for the purely original and indestructible powers of the soil is an unknown but possibly small proportion of total rents paid in respect of highly developed land: the remainder, also unknown, of the rental paid is a quasi-rent. Some part of this will relate to improvements which are absolutely permanent, e.g. clearing, the remainder will relate to depreciable improvements, e.g. drainage, the cost of which must be covered in the long term if these depreciable improvements are to be maintained.

The existence of a quasi-rent is not, however, a necessary condition for the carrying out of such maintenance work (assuming that the relevant resources are not earning rents in other industries); all that is necessary is that the return from these depreciable improvements should cover their servicing costs.

But the existence of quasi-rents would be necessary to draw further resources into the industry to effect new improvements of this nature - that is to say, if the price of the product for which the land is being used rises sufficiently quasi-rents would appear and new resources would flow into the industry and existing land would be further improved.

As the rent which land attracts is due in part to its scarce supply the nature and extent of the rise in rents
following an increase in demand for the products of farming will depend on the elasticity of supply of land. This elasticity in turn, depends very much on whether we are considering agriculture as a whole or simply one industry and whether we are thinking in terms of the short or the long term.

If only one industry, e.g. wool, received an increased price for its product, or if its price increased relative to the price of other agricultural products, the elasticity of supply of land in respect of the wool industry in terms of physical units of land could be fairly elastic in the short term. In the 1950's wool boom, for example, very large numbers of non-wool producers started to run sheep.

If on the other hand there were a general increase in prices of agricultural products, the resulting rise in the demand for land could not be satisfied by switching land from one use to another. Thus in the short term the supply of land would be highly inelastic and agricultural land rents would be high. In the longer term, more intensive farming practices would lead to an increase in agricultural output. In advanced countries there is a strong upward trend in the rate of application of capital to land as the result of technological advancement. As Keiper\(^{(1)}\) points out, increased technology is a powerful factor in increasing the supply of land in terms of agricultural output and in this regard, Australian agriculture is typical. In modern times this "productivity" factor has been far more important in meeting the demand for land than the opening up of virgin lands.

**Capital Goods**

As regards capital goods, Marshall pointed out that earnings in the short term when supply is fixed are in the nature of rent (he called them quasi rents)\(^{(2)}\). This is

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\(^{(1)}\) Keiper, op. cit., p109

\(^{(2)}\) Marshall, op. cit., p412
so because the supply of the factor is only able to respond to demand forces in the longer run, increasing or decreasing accordingly as the earnings of the factor are higher or lower than the rate of interest on floating capital. In the short run supply is fixed and the price of the factor embodied in the enterprise is determined by the demand for its product. This price or earning of capital embodied in an enterprise is a quasi rent and is defined as the total earnings of a factor less its servicing costs, in the short term.

If the demand for farm capital rises, the resulting rise in its price will depend on its elasticity of supply and if this were low the demand for capital would also be governed by the elasticity of substitution of land for capital (labour would not be important in this regard because in Australia substitution of labour - which is in relatively scarce supply - for capital on farms is highly unlikely).

In general, the elasticity of supply of capital goods depends on the level of merchandising stocks, the elasticity of supply of imports and the degree of roundaboutness of production of these goods. In respect of those capital goods which are in common use in both the agricultural and non-agricultural sectors, the elasticity of supply could be expected to be relatively high if the farm sector were relatively small in relation to the total economy as in Australia. In respect of capital goods which are specialized to the farm, e.g. harvesters, the elasticity of supply could be expected to be lower than for other capital goods.

The lower the elasticity of supply of a capital good the greater is the tendency for the price to increase
assuming no substitution. However, the supply price of complex industrial goods is often not importantly a function of short term demand. Rather it is related to costs in the medium to long term. In other words, prices of capital goods are often unresponsive to short term changes in demand and only tend to change in the short term in response to increases in production costs. In these circumstances, the rationing influence of price is temporarily superseded by physical rationing by suppliers usually on the basis of the chronological placement of orders; of course, unless demand pressure persisted into the longer term, this might only amount to little more than longer-than-normal delivery dates.

If, following an increase in prices of farm commodities, prices of capital goods do not increase because of price policy of manufacturers then capital goods purchased in response to this rise in price would, like embodied capital goods earn a quasi rent equal to their earning rate less their servicing cost, which would accrue to producers.

However, if the prices of capital goods responded to the short term pressure of demand then the producer will not earn a quasi rent on new acquisitions of capital but only in respect of his existing supply of capital.

**Labour**

The rent earned by labour (or ability) is the difference between its actual earnings and its transfer earnings. If the actual earnings of labour in a particular industry were to fall below its transfer earnings, the supply of labour in that industry would fall to zero. Normally the rental earnings of labour disappear in the long term. In rare instances some persons possess particular skills which cannot be duplicated; in these cases, rental earnings would continue into the long term.
If the demand for labour rises, the resulting rise in price will be the greater, the lower its elasticity of supply and the lower the elasticity of substitution of capital for labour.

Traditionally Australia has been a labour scarce country and our agriculture has never been characterized by the existence of significant levels of disguised unemployment once so common in European and still very common in Asian agriculture. Further in the post-World-War II period the fast developing industrial sector in this country has exerted a strong pull on labour resources and labour shortages have at times been most pronounced. Agriculture has not been isolated from these events and accordingly the current farm labour supply may be taken to have relatively low elasticity.

When the demand for the product of one farm industry increases, wages rates in that industry have to rise to attract the further labour units required for the increase in production. This increase in wages would tend to spread right through the industry. These extra payments are quasi rents - they are not necessary to keep existing labour units in the industry but they are necessary to induce new labour units to enter the industry.

This is of particular importance to farm proprietors since the quasi rents must be paid out in the form of higher wages and thus represent additional real costs to the farming enterprise. This contrasts with the rental earnings of capital goods which accrue as additional income to the enterprise. And in an era of full or high levels of employment, it is not by any means certain that a rise in labour earnings in one sector will only/temporary. It is more likely that the inflow of labour into this sector will create shortages of labour in other sectors and thus lead to competitive bidding for labour. This would, cet. par., create a tendency for industries unable to pass on cost increases in the form of higher prices, to stagnate.
Enterpreneurial Rent

In a competitive industry a firm is in equilibrium when marginal revenue, marginal cost and average cost are equated. This happens when factor supply has been adjusted to factor demand and quasi rents have been eliminated. Each factor will then be earning an amount equal to its marginal revenue product and there will be a residual component of the price which will represent the reward for the entrepreneur for his skill. The entrepreneur performs an essential function which can never be eliminated and as it is specialised its earnings may be called a rent (1). Actual earnings will, of course, be the greater, the more efficiently productive factors are combined.

Actual earnings are partly anticipated and partly unanticipated. Of the two types only anticipated earnings act as a motivating force in the organization of production; this may be termed entrepreneurial rent. Unanticipated returns are unexpected windfall returns and are properly regarded as pure profits. As Keiper points out the separation of entrepreneurial rent from profits is based conceptually on the distinction between risk which in a probability sense can be reduced to a cost and uncertainty which cannot be anticipated (2). This conceptual distinction is, however, impossible to make in practice. In other words, entrepreneurial rent cannot be identified in the residual earnings of an enterprise after payments to other factors of production have been made.

(1) Keiper, op. cit. p.115
(2) ibid, p.115
From the foregoing discussion the following points which will be of decided interest in our consideration of the policy of cost-based price stabilisation in the wheat industry and the assessment of costs for that purpose, emerge:

1. Any factor of production may earn a rent.

2. Only that part of the rental earnings of a factor in excess of its servicing cost (reflecting the cost of capital) is not a cost to producers.

3. Rent plays an important part in allocating economic resources thus any attempt to limit these earnings in one industry would inhibit the economic allocation of resources; and would, cet. par., encourage the withdrawal of resources from that industry.

4. As regards land rent, it is impossible to distinguish between unearned rent due to the original powers of the soil from quasi rent due to basic improvements to land.

5. Quasi rental earnings of labour (excluding farmers' own labour) do not accrue to the farm enterprise and thus represent a real cost to producers at all times. These earnings tend to disappear in the longer term.

6. Quasi rental earnings of embodied capital accrue as part of the earnings of farm enterprise and tend to disappear in the longer term. They are not a cost to producers.

7. Entrepreneurial rent is the residual (if any) in enterprise earnings after paying for all factors and reflects the skill differentials of producers in combining factors of production together. This item, by its very nature is not a cost to any producer.
Reflecting land rents in a cost-based price provides the price fixer with a first class dilemma. Normally it would be desirable to use market prices because this would be consistent with the objective of reasonable incomes for producers and, at the same time, it would tend to minimize any misallocation of resources resulting from the use of guaranteed prices.

However if, say, wool prices and thus land values were high and these values were reflected in the guaranteed wheat price a misallocation of resources would result and wheatgrowers' incomes would exceed the reasonable levels the guaranteed price was intended to provide. In this situation the social cost of the welfare objective would be higher than necessary.

In such circumstances land values should be assessed on a more conservative basis, perhaps at the level indicated by longer term trends, and the guaranteed price should act as a floor price rather than as an actual return to the producer. (This would not need to be inconsistent with the principle of the wheat stabilization fund). This is already the position with regard to exports up to the guaranteed level and the principle could be applied to home consumption as well.

In the opposite situation of depressed land values, the values for costing purposes in terms of the policy objective would need to be above such values. However, as this would encourage an inflow of resources into the industry the policy would, cet. par., bankrupt itself unless production controls were also introduced.
(c) **Effect of Guaranteed Wheat Prices on Resource Allocation**

We shall now consider how land was valued in the wheat stabilization schemes and what effects this and the pricing of other cost items appeared to have on the allocation of resources through the cost-based guaranteed price.

In the first two schemes running from 1948/49 to 1957/58 the valuation basis was long-term security value which is approximately 75% of the market value. The land values reflected in the first scheme were those ruling in 1947 and in the second scheme those ruling in 1950 - the survey in regard to this latter scheme covering the three year period ended 1949/50.

The broad movements in land values has been summed up by Macphillamy (1). These relate to New South Wales but they can be accepted as being indicative of price trends for Australia as a whole.

"By 1946, pent-up demand for rural lands had become very noticeable and marked the end of a long and difficult period for rural producers which went back as far as 1929. The earlier stages of this period were characterised by low commodity prices, indifferent seasons and uncertainty, whilst in the latter stages, war-time controls, shortages of labour and materials, lack of finance and drought had all assisted to keep demand in check.

"1946 saw the end of a long and disastrous drought and with the war concluded, demand for land strengthened. Transactions were restricted, however, by the operations of Lands Sales Control which had, under National Security Regulations, related "consent" prices to those ruling as at the 10th February, 1942. The Commonwealth handed over these controls to the States on September 20th, 1948, who continued them for a further period, which in New South Wales was of approximately a year's duration.

(1) *Australian Journal of Agricultural Economics, December, 1964.*
With the lifting of controls, a land hunger was evidenced by a large volume of transactions and steeply increasing prices which did not abate until prices had risen spectacularly and prospects had become more uncertain.

The actual end of controls was followed very closely by currency devaluation in September, 1949; the Korean War broke out in June, 1950; as a result the price of primary products continued to rise, partly because of stockpiling, culminating in the sensational prices reached by wool during 1950 - 51 (£1 per 1 lb.).

Prices continued to increase for most types of land after 1951 - 52 but at a steadily decreasing rate until about 1956 - 57 since when they have been relatively stable in spite of fluctuations in commodity prices, taxation, interest rates and finance available for the purchase of land."

It will be seen from these comments that land values had not risen at all in step with the increase in the overseas demand for foodstuffs following the war. Various factors contributed to this but the main two were price control on land and both bulk marketings of foodstuffs overseas at less than world market prices and price control of foodstuffs on produce consumed locally. It is apparent then that land values were artificially low at the time the valuations were made for the first scheme.

Table I indicates that by 1948/49 the value of land suitable for wheat growing had increased by only 25% on a pre-war base. By comparison the wholesale price index on the same pre-war basis (Table 2) indicated a rise in prices of 80%. This index showed that the prices of foodstuffs and tobacco had also risen 74%. It is therefore quite clear that land values were being effectively controlled and that in real terms values were actually lower than in the immediate pre-war period.
## Index of Rural Land Values, New South Wales

Base 1937-39 = 100

<table>
<thead>
<tr>
<th>Year</th>
<th>Grazing Land (a)</th>
<th>Grazing: Part arable (b)</th>
<th>Agricultural Land Suitable for sown pastures</th>
<th>Wheat, fat fodder crops and high prod’n sown pastures</th>
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<td>120</td>
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(a) Merino breeding and wool growing.

(b) Suitable for sown pastures.

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<tr>
<th>Year</th>
<th>Foodstuffs &amp; tobacco</th>
<th>All Groups</th>
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Source: Commonwealth Statistician
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<th>Export Surplus m. bus.</th>
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Source - Commonwealth Statistician.
The valuation basis in the first scheme must therefore have greatly understated the free market value of land for not only would the valuations have been artificially low if they had been based on the current controlled prices but they understated the market value even further by taking only 75% of the current value to give long term security value.

As land is a major cost item the effect of this on the cost formula would, cet. par., have been to discourage expansion of wheat production. In addition to this, the allowance in the cost formula for the owner-operator was, as indicated in Part II, grossly inadequate. Combined with apparent underpricing of other items in the cost formula, the effects of these two major cost items must have represented a considerable under-assessment of real costs.

Fortunately for the wheat grower only that part of his production which was consumed locally was disposed of at the assessed cost of production figure. The remainder, which was exported, attracted very high prices so that the average returns to growers for the whole of their production was considerably above the guaranteed price. The importance of exports in this regard is indicated in Table 3 where it will be seen that, except in drought years, exports have ranged from 100 million bushels upwards as compared with annual home consumption of 70 to 80 million bushels.

Nevertheless, the low domestic price for wheat made wheat growing relatively unattractive and wheat acreages started to decline. In 1949-50, for example, the area sown to wheat was down 1.7 million acres from the
1947-48 level of 13.9 million acres (Table 4). Notwithstanding that, export prices were still very high at 15/10d a bushel in relation to the guaranteed price of 7/lld a bushel (Table 5).

From 1950/51 the influence of high wool prices (Table 4) was also reflected in the drift from wheat growing but the influence of the home consumption price arrangements was also a factor. The dissatisfaction of wheatgrowers with the large discrepancy between domestic and export returns actually forced the government to amend its guaranteed price arrangements. The application of the guaranteed price to domestic producers of pigmeats and poultry was discontinued and a much higher price set. In addition the government in 1951/52 and 1952/53 paid subsidies to growers to raise the level of their returns to a price of 16/lld a bushel, a price approaching f.o.b. export values.

Very clearly the guaranteed home consumption was now without any force or application.

With the cessation of price controls on land at the turn of the decade, values rose strongly as indicated in Table 1. From a 1948-49 level 25% above pre-war, land suitable for wheat growing reached a level 70% above pre-war in 1949-50 and 240% above pre-war in the following year, the year of the Korean War boom.

Taking the demand for wheat at the average export price as infinite because Australian exports are too small a proportion of total supplies in world markets to significantly affect the ruling price, it is evident
<table>
<thead>
<tr>
<th>Year</th>
<th>Acreage</th>
<th>Production</th>
<th>Greasy Wool Price</th>
<th>Quantum of Farm Production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M.Ac.</td>
<td>M. B.</td>
<td>d. lb.</td>
<td></td>
</tr>
<tr>
<td>1947-8</td>
<td>13.9</td>
<td>220</td>
<td>39.50</td>
<td>109</td>
</tr>
<tr>
<td>1949-50</td>
<td>12.2</td>
<td>218</td>
<td>63.35</td>
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<td>144.19</td>
<td>109</td>
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<td>9</td>
<td>10.4</td>
<td>215</td>
<td>48.57</td>
<td>149</td>
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<tr>
<td>1959-60</td>
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<td>57.78</td>
<td>144</td>
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<td>16.5</td>
<td>307</td>
<td>58.96</td>
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<td>4</td>
<td>16.5</td>
<td>328</td>
<td>69.70</td>
<td>173</td>
</tr>
</tbody>
</table>

Source: Wool prices - National Council of Wool Selling Brokers
        Other data - C.B.C.S.
Table 5: Wheat-Guaranteed Price, Home Consumption Price, Average Export Value f.o.b. and Pool Payments 1948-49 to 1963-64 (per bushel)

<table>
<thead>
<tr>
<th>Season</th>
<th>Guaranteed Price</th>
<th>Home C. Price</th>
<th>Av. Export Value f.o.b.</th>
<th>Pool Payments (bulk wheat)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>s. d.</td>
<td>s. d.</td>
<td>s. d.</td>
<td>s. d.</td>
</tr>
<tr>
<td>1948-49</td>
<td>6 8</td>
<td>6 8</td>
<td>15 7.0</td>
<td>11 3.4</td>
</tr>
<tr>
<td>1949-50</td>
<td>7 1(a)</td>
<td>6 8(a)</td>
<td>15 10.3</td>
<td>13 0.1</td>
</tr>
<tr>
<td>1</td>
<td>7 10</td>
<td>7 10</td>
<td>17 2.8</td>
<td>12 7.4</td>
</tr>
<tr>
<td>2</td>
<td>10 0(b)</td>
<td>10 0</td>
<td>17 7.0</td>
<td>14 2.9</td>
</tr>
<tr>
<td>3</td>
<td>11 11(b)</td>
<td>11 11</td>
<td>17 5.5</td>
<td>14 11.7</td>
</tr>
<tr>
<td>4</td>
<td>12 7(c)</td>
<td>14 12(c)</td>
<td>14 0.4</td>
<td>12 0.8</td>
</tr>
<tr>
<td>5</td>
<td>12 7(d)</td>
<td>14 12(c)</td>
<td>12 6.5</td>
<td>11 0.8</td>
</tr>
<tr>
<td>6</td>
<td>13 1(e)</td>
<td>13 1(d)</td>
<td>12 10.6</td>
<td>12 0</td>
</tr>
<tr>
<td>7</td>
<td>13 8(c)</td>
<td>13 9(d)</td>
<td>14 2.7</td>
<td>12 6.1</td>
</tr>
<tr>
<td>8</td>
<td>14 2(d)</td>
<td>14 4(d)</td>
<td>13 10.4</td>
<td>12 11.9</td>
</tr>
<tr>
<td>9</td>
<td>14 6(d)</td>
<td>14 8(d)</td>
<td>13 2.3</td>
<td>13 2</td>
</tr>
<tr>
<td>1959-60</td>
<td>14 10(d)</td>
<td>15 10(d)</td>
<td>14 3.5</td>
<td>14 5.3</td>
</tr>
<tr>
<td>1</td>
<td>15 2(d)</td>
<td>15 4(d)</td>
<td>13 4.7</td>
<td>13 7.6</td>
</tr>
<tr>
<td>2</td>
<td>15 9(d)</td>
<td>15 10(d)</td>
<td>14 3.5</td>
<td>14 5.3</td>
</tr>
<tr>
<td>3</td>
<td>15 10(d)</td>
<td>15 11(d)</td>
<td>13 6.8</td>
<td>13 11.3</td>
</tr>
<tr>
<td>4</td>
<td>14 5(d)</td>
<td>14 7(d)</td>
<td>14 5</td>
<td>13 9</td>
</tr>
</tbody>
</table>

(a) Growers paid a subsidy of 5d. a bushel to meet the guaranteed price.

(b) In 1951-52 subsidy of 4s. 1d. paid; in 1952-53 subsidy of 2s. 5d. Home consumption price of stockfeed was fixed at 12s. 0d. on 1951-52 and 13s. 11d. in 1952/53.

(c) Includes loading of 1½d. to meet the cost of shipping wheat from the mainland to Tasmania.

(d) Includes loading of 2d. to meet the cost of shipping wheat from the mainland to Tasmania.

Sources: Commonwealth Statistician and Australian Wheat Board.
that guaranteed prices reduced the real level of the national product because resources were discouraged by the effects of the guaranteed price arrangements from entering the wheat industry notwithstanding that the marginal revenue productivity of factors in the industry was higher than the respective marginal value productivity of these factors generally.

The valuation basis for land in the second stabilization scheme was again long term security value and as it related to values ruling in 1950 it was again to underprice land in relation to its potential earning capacity at free market prices. The practice of valuing land once in each stabilization scheme and that at a point of time well in advance of the first year of the scheme introduces a rigidity in the cost formula which may lead to undesirable consequences, if, as in the first scheme, other arrangements are not introduced to offset the effects of such rigidities.

If we look at Table 1 again we shall see that the 1950 valuation of land in the second scheme was probably not above the level of 150% of pre-war values - roughly 75% of the mean of the two years 1949-50 and 1950-51. By the time the second scheme got under way in 1953-54, however, land values had risen to a level 285% of the pre-war level. Again we find an important conservative element in costs and thus in the guaranteed price. The allowance for the owner-operator on the other hand, though still conservative, was much more realistic than in the first scheme. Other cost items were also underpriced but the overall effect was clouded by the unsatisfactory division of costs between wheat production and sidelines.
The reaction of wheat growers to the guaranteed prices ruling under the second stabilization scheme is reflected in the trend in acreages. In 1953-54, the first year of the scheme, 10.8 million acres were sown to wheat but by 1957-58 the acreage was down to 8.8 million acres. This latter figure probably exaggerates the drop in acreage because it was a drought year but there is no doubt that the downward trend in acreages evident by the turn of the decade continued during the second scheme.

Of course, the high average level of wool prices played a part in the movement of resources out of wheat growing during the middle 1950's. In the first year of the second scheme wheat growers were still being denied an export parity price in respect of home consumption but the following year with the downward trend in export returns continuing, average export values fell to the level of the guaranteed price (Table 5). Thereafter the guaranteed price and thus the home consumption price tended to exceed the export returns by a small margin, the deficit in export returns being financed out of previous growers' contributions to the wheat stabilization fund. By 1956/57 this was possibly reflected in the lower land values, the index registering a drop of 7% in the face of a strong wool market in that year, although the drought was probably the strongest factor in the movement.

On balance it appears that in the second scheme the guaranteed prices which were then fairly close to the level of export returns did not lead to misallocation of resources as in the first scheme and thus that in the absence of guaranteed prices the level of production would have been much the same. But the wheat industry was strongly affected by the higher wool
prices resulting in a considerable movement of resources from wheat to wool production.

In the third stabilization scheme land was valued at fair market value.

The Commonwealth Bank defined fair market value as follows:-(1)

"The accepted meaning of market value is the amount which the land might be expected to realize on the open market in competition between a willing, but not over-anxious, buyer and a willing, but not over-anxious, seller. This definition has been supported by the Courts. In some Valuation Acts improved value is defined, in effect, as the amount which the land might be expected to realise if offered for sale on such reasonable terms and conditions as a bona fide seller would require.

"Because of price inconsistencies which are characteristic of the land market, particularly since the year 1949/50, prices realised for individual properties are often higher or lower than valuers' and land agents' estimates based on the general level of value disclosed by district sales. There exists therefore, an expected range within which the price can be expected to fall. The mid-point of this range may be regarded as the fair market value and the lower point of the range, the conservative market value.

"The term 'conservative' in relation to the market value of land has never been properly defined, but is often regarded by valuers as a figure around the bottom of the price range disclosed at the market. The percentage difference between conservative and market value and fair market value thus depends upon the width of market fluctuations. It is frequently some 5% to 10% below the fair market value. In respect of sample properties in the 1957 wheat survey the conservative market value, if applied, would probably have averaged around 5% below the mid-point of the range."

At the same time the allowance for the owner-operator was raised to a level which, as indicated in Part II was probably as intended, close to

income parity vis-a-vis non-farm workers. Further other changes were made in the cost assessments which tended to raise costs. On the other hand the insertion of a more realistic (but still not in itself an adequate) yield figure had the effect of reducing unit costs. The net change in the guaranteed price was an increase of 4d a bushel on the previous year's figure of 14/6d.

In the course of the third scheme wool prices decreased considerably and wheat growing with guaranteed prices thus became relatively more profitable. As a consequence resources moved back into wheat production. (1) The extent of the change is reflected in the following figures. Areas sown to wheat increased from 10.4 million acres in 1958/59 to 16.5 million acres in 1962/63. Over the same period production rose from 215 million bushels to 323 million bushels, a rise of 50%.

For the whole of the third scheme the guaranteed price which was increased each year by the assessed movement in cost of production exceeded average export realizations which, reflecting consistent selling policies of the U.S.A. and Canada who isolated their surplus production from commercial markets and the moderate stabilizing influence of the International Wheat Agreement, remained remarkably stable.

The Wheat Price Stabilization Fund was used to bring producers' average returns in respect of 100 million bushels of exports up to the guaranteed price but in 1959-60 the Fund was exhausted and the guarantee was maintained by direct Commonwealth subsidy. Over the course of the third scheme subsidies totalling £30.5 million were made to bring producers' returns up to

guaranteed levels.

In this situation the marginal revenue productivity of resources in the industry fell below their marginal value productivity and marginal revenue productivity in other industries and a misallocation of resources resulted. However, since the lower marginal revenue productivity was not reflected in lower earnings to factors because of the subsidy, no incentive to leave the industry existed.

After a further farm survey in connection with the fourth (and current) stabilization scheme the guaranteed price for 1963-64 was reduced by 1/5d a bushel to 14/5d a bushel. This reflects, inter alia, the rise in average yields in the wheat industry. It also indicates that the rigidified practice of using one yield figure over the course of a stabilization scheme when a known trend in yields exists is unrealistic. As indicated in the appropriate section of Part II there is no reason for not incorporating a trend yield figure into cost assessments on a year-by-year basis.

The wheat stabilization scheme is far from being an open-ended scheme guaranteeing prices of everything produced. The price guarantees are limited to domestic demand plus a defined quantity of exports (for which there traditionally has been a market) and any tendency for production to be encouraged by the "illusion" of the guaranteed price results in a watering down of average returns to producers. Furthermore, in that each scheme is only of five years' duration after which a review is made and a new scheme devised, it might be argued with some force that the scheme has "built-in" safeguards to minimize the misallocation of resources that could otherwise result.
We may finally consider the effect of guaranteed wheat prices on industries which use wheat as an input or which compete with wheat as a feed grain.

The major rural industries using wheat as a major input are the pig and poultry industries. In the early years of stabilization these industries paid only the home consumption price for the wheat they used but after a time wheatgrowers became dis-satisfied with this state of affairs and in 1951-52 and 1952-53 the price of wheat to these users was lifted to a level closer to export parity. A year later a decision was taken to make these users pay the export parity price for their wheat. When this occurred the pig and poultry industries lost their competitive advantage over overseas producers and the export sector, partly for this reason, stagnated.

Commodities which compete with wheat as a feed grain are barley and oats in the cereal group and maize and sorghum as other grains. Because these grains have close price relationships with each other it follows that if the price of wheat is fixed arbitrarily the effect of this will be reflected in feed grain prices generally and thus in the allocation of resources in respect of their production. Furthermore as the influence of these feed grain prices, which will generally be higher or lower than would obtain if wheat prices were market determined, is exerted the allocation of resources in all livestock industries using feed grains is affected. Thus when wheat prices were relatively low in the earlier years of stabilization, production in the user industries could be regarded as having been carried to a higher level than otherwise. In effect the production of these user industries was being subsidised.
In the situation which has prevailed in recent years, where domestic prices have tended to exceed export parity, the price of feed grains would have tended to inhibit the level of production of those livestock industries using feed grains as an important input.
Income Distribution

Normally income is distributed through the shares of factors in the price of the products they produce. The equilibrium position occurs when the marginal value productivity of a value-unit of one factor is equal to the marginal revenue productivity of a value-unit of each other factor.

However when prices are fixed arbitrarily above or below the market price of a product a redistribution of income will take place. In the case where the price is fixed above the market price the transfer of income may be from the taxpayer to the producer and/or from the consumer to the producer. Under wheat price stabilization both of these means of redistributing income are used, the former in relation to certain quantities of wheat exported and the latter in relation to domestic consumption in Australia.

The apparent re-distribution of income resulting from stabilized wheat prices is shown in Table 6 which was calculated on the basis of multiplying the volume of home consumption by the difference (+ or -) between the home consumption and average export price and adding to this any direct subsidy on exports. This indicates that over the course of the first three stabilization schemes there has been a net transfer of income from wheatgrowers to consumers with a considerable balance of advantage in favour of consumers. Moreover if we took the present value of the income redistributed each year we would clearly get an even greater balance in favour of consumers.

The general order of the import parity price has been indicated in the last column of Table 6. If the consumer were charged this price for wheat which the low elasticity of demand would make possible for a monopoly seller, growers would earn greater profits and new resources would flow into the industry. But as the marginal revenue productivity of these resources would
### Table 6. Wheat: "Subsidy" Element in Guaranteed Price

<table>
<thead>
<tr>
<th>Year</th>
<th>Home Consumed</th>
<th>Excess of H.C. Price over AV. Export Price</th>
<th>Subsidy Export Element in H.C. Price</th>
<th>Total Subsidy Paid</th>
<th>Excess of Notional Import Parity Price over H.C. Price</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mill. Bush</td>
<td>s.d.</td>
<td>£M</td>
<td>£M</td>
<td>£M</td>
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<tr>
<td>1947-48</td>
<td>62.4</td>
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<td>-35.9</td>
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<td>-26.1</td>
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<td>-2</td>
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<td>5</td>
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</tbody>
</table>

Total: 139.1  30.6  -108.5

(a) Import parity price based on U.K. equivalent of Australian f.o.b. price less "Atlantic" freight plus "Pacific" freight.

Source: Derived from statistics published by Commonwealth Statistician and Australian Wheat Board.
not be greater than in other industries (since the wheat export price may be taken as fixed) no increase in the national product would occur.

When the home consumption price of wheat is fixed below its market price - a position which prevailed for many years - there will be fewer resources engaged in the industry than under market prices. But since their marginal revenue productivity would be greater in the wheat industry under free market prices than in other industry more would be added to the national product by the production of more wheat than would be foregone by the loss of production in the other industries. Thus the community as a whole suffers a lower level of income in these circumstances.

It is clear therefore that guaranteed prices as a means of redistributing income to ensure reasonable incomes for producers, are inappropriate and wasteful. Such prices are even less effective in redistributing income within an industry for as Karl Brandt (1) has noted they pro-rate the transferred income according to the scale of operation.

Price and Income Stabilization

If the collapse of wheat prices in the 1930's left an indelible mark on the minds of our wheat producers and legislators, its effects were no less important in the evolution of agricultural policies generally.

In this regard the Royal Commission on the Wheat, Flour & Bread Industries indicated that the principle of protecting the home producer of primary products had been adopted as a cardinal point of policy of many countries.

It was evident that the disruptive effects on farmers of widely fluctuating world market prices for farm products were becoming socially unacceptable in many countries. This trend in official thinking has not since changed. Indeed, in the post World War II era, non-tariff policies for protecting domestic agriculture sectors have actually been extended and refined notwithstanding continuous pressure from traditional primary-producer-exporting countries, in bilateral and multilateral negotiations, to curtail such policies.

The principle of income stabilization of farmers at reasonable levels is now a basic tenet of agricultural policy of most nations. It has been further defined to mean income parity as between farm and non-farm workers.

This principle of income parity, inter alia, was in fact a negotiable issue at a number of conferences of the Food and Agriculture Organization and ultimately resulted in the formulation of an agreement to a set of principles for price stabilization and support policies. These principles recognize that income parity between farm and non-farm groups is a legitimate objective of national farm policies. (2)

(1) 5th Report
As explained in Part II with reference to the owner-operator's allowance, in the third wheat stabilization scheme, the principle of income parity as between wheat growers and non-farm workers, implemented through stabilization of the price of wheat, was, in effect, endorsed as policy. Of course to the extent that this guarantee was limited to a defined volume of production, there was no guarantee that income parity would be maintained if production increased.

In its purest form, price stabilization may be conceived to be a self-balancing mechanism through which some part of the income earned or which could be earned in years of good prices and good incomes is transferred to years of otherwise low prices and low incomes by fixation of producer prices at their expected mean or trend level. The basic justification is that it eliminates socially undesirable price fluctuations without affecting price trends.

In terms of the objective of reasonable producer incomes, this form of price stabilization is appropriate in respect of commodities whose prices have neither an upward nor downward trend but are subject to considerable fluctuations around a mean price level which is in itself satisfactory. This is because a price determined on the basis of the (satisfactory) mean level of prices would ensure reasonable average incomes over a period. But if past experience were to indicate either an upward or downwards trend in prices and if this trend were expected to continue in the future, then the pure form of price stabilization would not ensure reasonable farm incomes, since if prices had a downward trend then, ceteris paribus, the stabilization price would return producers less than reasonable incomes and vice versa.

In this situation the logical way of stabilizing prices would be on the basis of trend, not average, prices. In this connection we might ask ourselves:

What are the future prospects for basic foodstuffs?
The history of world agricultural production is one of continuing growth featured by periods in which the demand curve for agricultural products has moved to the right more rapidly than the supply curve and the trend in prices has been upwards, and periods when the supply curve has moved to the right more rapidly than the demand curve and prices have exhibited a downward trend.

On present indications the future position is not encouraging from the producer's point of view as factors affecting the demand for agricultural products, one the one hand, and the supply of agricultural products, on the other, are expected to cause the supply curve to move to the right faster than the demand curve and thus widen the gap between total production and commercial market opportunities.

The level of demand for a commodity will ultimately depend on the size and structure of the population, the level of per caput incomes, the tastes and preferences of consumers, and the nature of the reaction of consumers to price changes (price elasticity of demand) including the willingness with which consumers will substitute one commodity for another (the elasticity of substitution) following a relative movement in their prices. In the short term changes in demand are not usually much affected by population and consumer tastes, for the reason that these do not tend to change significantly in the short run. Wars, booms and depressions have marked effects on demand but these are short term factors and only trends in population, per caput incomes and consumer tastes remain as the main factors in the state of demand in the long term.

For agricultural foodstuffs the income elasticity of demand is low (except in low income countries) and it is becoming more and more important as a factor limiting the growth of markets for basic agricultural commodities.

The price elasticity of demand for basic food is also extremely low so that much the same quantity is demanded whatever the price. As a result, any shortfall in supply below
the level of demand tends to cause a sharp rise in price and any surplus of supply a sharp drop in price.

On the supply side new agricultural technology has provided and is continuing to provide a springboard for dramatic increases in production. Farm mechanisation, land use improvement, soil conservation, fertilizers, new crops and breeding have all combined to increase the supply of agricultural products faster than the expansion of the demand for these products.

In this situation that aspect of agricultural supply viz., its low propensity to contract when prices fall or markets shrink, makes market equilibrium an elusive goal. The resulting tendency is for a secular decline in agricultural prices.

The agricultural producer is therefore faced with the prospect of widely fluctuating prices in the short term and an increasingly marked tendency for a persistent decline in prices over the long term. His position is further complicated by an opposite movement in the prices of industrial goods and thus by a relatively more marked decline in the "terms of trade" of agricultural products for industrial products (1). Moreover, agricultural producers who depend on export markets for the disposal of a significant proportion of their production have had their positions further undermined by the now highly protective national agricultural policies of leading industrial countries (2).

The policy of price stabilization and income parity for wheat growers as presently conceived would thus appear to be facing greater problems in the future than were experienced in the recent past because of the tendency for a secular decline in wheat prices unless this is corrected by structural adjustment between world wheat producers, which is hardly a possibility, or continuation of present selling policies of Canada and U.S.A. who together keep the price of wheat from collapsing by withholding surpluses from the market.

(2) ibid., p.13.
Table 7 shows the gross value of wheat production in Australia from 1949-50 to 1962-63. It will be evident from this that there have been considerable fluctuations in year-to-year gross earnings. In view of the fact that the general price level and the production of wheat both increased during this period (Table 2), we might have expected as a sign of the success of the policy of providing reasonable income to producers a more definite upward movement in gross values. That this did not occur indicates that the objective of reasonable incomes for producers has not been guaranteed by price stabilization, as such, on a year-to-year basis. This reasoning presupposes no radical changes in the number of farmers growing wheat, which is considerably reasonable since statistics of wheat farm numbers indicate considerable stability. There would, of course, be serious administrative difficulties in attempting a direct transfer of income to producers if their incomes were low and the existence of such a policy would also remove incentives to improve their productivity. But incomes could be stabilized much more satisfactorily if the cost on which the guaranteed price is based, were assessed on the basis of actual yields each season. As indicated in Part II in the section on yields, there are no insuperable problems in this regard.

The attitude of wheat growers to the price stabilization scheme is reflected by the fact that whereas agreement of the majority of producers to such schemes is normally obtained by referendum before a scheme is implemented, wheat growers' representatives have been able to indicate in respect of the third and fourth schemes that growers are so solidly behind stabilization that further referenda were unnecessary. It is therefore evident that the grower is well satisfied with the average level of income over a number of years under wheat stabilization even if actual yields cause considerable variations from year to year.
A wheat price stabilization fund is set up under each scheme as the instrument of policy in maintaining guaranteed prices in respect of the volume of exports covered by the price guarantee. It is not concerned with home consumption prices. The Table below indicates fund credits and balances during the first three stabilization schemes.

Funds for the scheme are provided by growers by means of a tax on exports when export prices are above the guaranteed price up to a maximum of 1s.6d a bushel. These funds attract interest. At the present time the limit on contributions to the fund is £30 million.

Both these limitations while notionally inconsistent with the principle of stabilization do have the virtue of reducing any misallocation of resources resulting from guaranteed prices.

In the first scheme no withdrawals were made from the fund for stabilization purposes but to prevent the build up of excessive amounts in the fund refunds were made to growers on a first-in-first-out basis.

In the second scheme a limit of £20 million was placed on contributions to the fund but this limit was never reached as export prices dropped below guaranteed prices and payments out of the fund were necessary.

In the third scheme the fund was again called on to make up the shortfall on export returns and the balance of growers contributions in the fund become exhausted. In terms of the stabilization arrangements the Commonwealth then provided
the funds required to meet the guaranteed price on exports. However there is no provision for the Commonwealth subsidy to be recovered if growers contributions to the fund commence again. The fund is not therefore self-balancing. It is evident however that during the second and third schemes the fund did provide an element of stabilization by transferring producers earnings from years of good prices to years of lower prices. However the fund was not large enough to be able to meet recurring deficits in export proceeds without direct subsidy assistance.

The outlook for wheat prices is such that the fund is unlikely to accumulate sufficient reserves from growers' contributions to be able to play a significant role in price stabilization as a self-balancing mechanism in the future.
TABLE 7: Wheat Prices Stabilization Fund

<table>
<thead>
<tr>
<th>Year</th>
<th>Credit to Fund £m</th>
<th>Balance at 30th June £m</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948-9</td>
<td>18.3</td>
<td>18.2</td>
</tr>
<tr>
<td>1949-50</td>
<td>13.0</td>
<td>31.2</td>
</tr>
<tr>
<td>1</td>
<td>14.0</td>
<td>28.2</td>
</tr>
<tr>
<td>2</td>
<td>12.7</td>
<td>27.9</td>
</tr>
<tr>
<td>3</td>
<td>8.3</td>
<td>20.6</td>
</tr>
<tr>
<td>4</td>
<td>0.3</td>
<td>Nil</td>
</tr>
<tr>
<td>5</td>
<td>5.1</td>
<td>5.1</td>
</tr>
<tr>
<td>6</td>
<td>4.5</td>
<td>9.6</td>
</tr>
<tr>
<td>7</td>
<td>0.3</td>
<td>9.8</td>
</tr>
<tr>
<td>8</td>
<td>0.8</td>
<td>9.4</td>
</tr>
<tr>
<td>9</td>
<td>1.6*</td>
<td>10.5</td>
</tr>
<tr>
<td>1959-60</td>
<td>0.5*</td>
<td>11.0</td>
</tr>
<tr>
<td>1</td>
<td>0.5*</td>
<td>5.0</td>
</tr>
<tr>
<td>2</td>
<td>12.0*</td>
<td>Nil</td>
</tr>
<tr>
<td>3</td>
<td>7.3*</td>
<td>Nil</td>
</tr>
</tbody>
</table>

* includes Commonwealth subsidy

Source: Australian Wheat Board.
In this section we shall consider, in turn, the influence of cost in the determination of market price, the notion of cost in relation to price fixing and the problems of cost assessment.

In long term equilibrium, price is equated with cost of production - the cost of the resources required to produce market demand. In the short term however the controlling factor in the determination of basic commodities is the volume of market supply and the state of demand and except that this level of supply is influenced by cost, an influence which is often remote and indirect, cost is not a factor in the short run movements affecting such products. The commodities will sell for what the buyers will pay, irrespective of their cost to the producer.

Short period equilibrium occurs when marginal cost is equal to price without necessarily being equal to average cost. This equilibrium position is achieved when a producer in response to say a change in price of his product adjusts his output with his existing supply of fixed resources until his marginal cost is equal to his marginal revenue.

As the length of the period increases, the influence of costs on prices and of prices on costs increases until marginal cost, average cost and price are equated in long period equilibrium. But not at any stage in this movement into equilibrium do costs decide prices or vice versa. Therefore long term equilibrium cost would not, except by accident, be the same as the short term cost. This means that the latter figure which is the sort of figure farm cost surveys purport to establish is not, economically speaking, an acceptable guide to the long term equilibrium price - the only price that will ensure equilibrium of supply and demand.

A cost-based price cannot therefore be reconciled with price formation under market conditions and, as we have seen,
the objective of such prices are only achieved at a social cost to the community.

The next matter to consider is the notion of cost in relation to pricing. In this regard Greer has pointed out that "cost finding for pricing purposes is necessarily the assemblage of a variety of costs facts which can be combined in a variety of ways to produce a variety of answers". It follows that if prices are set according to a cost formula which is not consistent with producers' ideas of costs the objective of achieving reasonable producer incomes is unlikely to be realized since the effects may either go too far or not far enough according to the circumstances. Candler has demonstrated that to the extent that a cost-based price incorporated a higher rate of return on capital and a higher allowance for farmers' own labour and management than farmers were prepared to farm for, the price of land would rise. This would in turn lead to a higher assessed cost and therefore a higher guaranteed price, the effects snowballing upwards with each revaluation of land.

In view of the fact that it is a practical impossibility to value land more than once in respect of each stabilization scheme there is no real opportunity for costs to escalate in the manner just discussed over the course of any one stabilization scheme. In any event the wheat stabilization scheme is quantitatively controlled and the price guarantee is only available in respect of home consumption and 150 (or before the fourth scheme 100) million bushels of wheat exported. Thus any tendency for resources to move into the industry would have the effect of reducing the average returns to wheat growers generally thus dampening down the expansion forces.

The other side of the picture is that the price fixer might also under-price factors in his cost formula in terms of producers' ideas of costs. When this happens, as it appears to have done in the first scheme, resources will flow out of industry.

(1) H.C. Greer: Cost factors in Price Making p. 33.
We turn now to consider the question of assessing a cost of production figure for an industry. Part II has been devoted to an appraisal of official cost assessments and the problems involved. Here discussion will be directed to two particular problems faced by the cost assessor; these are the problems of common costs on mixed farms and the widely variable unit cost performance of farms as indicated by survey data.

As to the first, the details examination of the so-called "sideline deduction method" made in Part II shows conclusively that this method is both conceptually and mathematically wrong and cannot be accepted as a basis for indicating the current cost position of wheat growers. The sideline deduction method proceeds from the assumption that sideline income (which is known) is normally equal to sideline cost (which is not known). An assessment is then made as to the extent that sideline income is above or below normal. This decided, a sideline cost figure can be calculated. In this way 54% of the total costs of mixed wheat farms were actually assumed away in the cost assessment based on the 1958 farm survey for the third scheme. It has been suggested in Part II that a possible answer to the problem of identifying costs on mixed farms is the standard cost method.

Throughout Australia's wheat growing areas the technical characteristics of wheat production as such, are basically similar. In part this is brought about by the complementarity of basic resources - land, labour and plant - and by the indivisibility of such resources as the labour of the farmer and plant and machinery.

As a consequence of this it appears that an acceptable indication of wheat costs of production could be given by standard cost methods. Allowance could be made where necessary for regional variability in producer's production functions by establishing a standard cost formula for each region having its own special characteristics. The regional cost figures could in due course by "weighted" into a national figure.
Standard cost formula could also be adapted to handle other farm activities, typically woolgrowing, by the addition of appropriate technical data.

As indicated in Part II, McLennan has experimented with standard costs for wheat. Unfortunately these results are based on assumptions that make it impossible to compare them with official cost figures.

As to the matter of the variability of cost experiences, as indicated by farm survey unit cost data, the main problem appears to be a failure to distinguish between actual unit costs of production and planned unit costs.

As stated earlier long period equilibrium occurs when marginal cost, average cost and price are equal but it needs to be understood that this occurs when expected marginal cost, expected average cost and price are equated. This is because actual cost diverge from expected costs due to uncontrollable deviations of actual from planned output resulting chiefly from climatic variability.

Consider, for example, a producer who has made all necessary changes in his organization of production in response to all long term factors of supply (e.g. new technology) and price (e.g. trend) so that his expected marginal cost, expected average cost and expected price "X" are equated. While these expectations (1) of our producer continue to obtain clearly he will not make any more changes in his organization of production (since any such changes could only worsen his expectations) notwithstanding that his actual costs are sometimes greater than, sometimes less than, but never equal to his expected cost. In other words, the equilibrium (and critical) relationship is that of expected unit cost to price not actual unit cost to price. And the same relationship holds, mutatis mutandis, in respect of short period equilibrium. If, in the light of this, we assume, as seems most reasonable, that farmers' actual production outlays are based on expected yields, then, apart from harvesting costs

(1) For sake of simplicity, it has been assumed that expected price "X" applies in each of several seasons in the long term.
which vary directly with yield we should relate producers' actual costs to their expected yields if we wish to obtain an approximation to their real unit cost position.
Comparison of Wheat Price Stabilization Policy with U.S. Price Support Policy

To conclude our appraisal of guaranteed wheat prices a brief comparison will now be made with U.S. price support policy.

Under U.S. price support arrangements, prices are calculated which aim to maintain the purchasing power of producers in terms of some satisfactory past period, i.e., to maintain their real income position. Such prices are called parity prices and are derived from what is called the parity index - a base-weighted aggregative index of prices paid by farmers for goods and services used in production and family living in the base period. The price of an individual commodity is determined as that price which will maintain a certain (parity) ratio between the price index of the commodity and the parity index. The ratio is customarily fixed within narrow limits.

The formula was defined in the Agriculture Adjustment Act 1933 and sought to establish prices which were equivalent in purchasing power to prices ruling in the 1909-14 period. (1) The formula has been modified over the years and the weight-base period of the parity index has been brought forward: however, in its main aspects it is still virtually unchanged.

The effect of the U.S. system of price supports has been serious overproduction and the accumulation of enormous surpluses thus causing a marked degree of disequilibrium in the markets of the commodities - the main one of which is wheat - concerned. In an attempt to combat this ex-

(1) See, for example, G. S. Shepherd, op. cit., p.280, et. seq.
plosion in production under favourable support prices, the U.S. intro-
duced a system of acreage allotments and land retirements under which
producers were compensated for land taken out of production. However,
under this system producers retired their poorer land and increased the
productivity of the land retained in production. (1) As a result surplus
production has continued.

The main criticisms that may be directed against the U.S. price
support policy are that the price supports have been set too high giving
a powerful stimulus to over-production; that resources are thereby mis-
allocated; that acreage controls have been ineffective; that price
guarantees for a few products affect the relations between the prices of
all farm products and thus affect supply responses of the entire agricul-
tural sector; that excess stocks exert a depressing influence on markets
even though they are sealed off; that the cost to the Treasury is too
high and finally that, as a means of redistributing income, they are in-
appropriate (since the income is pro-rated by the scale of operations)
and wasteful. (2)

Conceptually, the U.S. system may also be criticised for a number
of other reasons:
- the objective of the system was that it would restore and maintain the
real income position of farmers but parity prices do not adequately reflect
changes in producers' real incomes.

(1) Karl Brandt: op. cit., indicated that the key reason for the boosted
yields was the high excess of marginal revenue over marginal cost in
the application of more fertilizer and water to crops and pastures.

(2) See, for example, G. E. Brandow: Reflections on Farm Policy, Past
and Karl Brandt op. cit.
the prices paid index relates to all farms and is not therefore representative of any one industry nor appropriate in respect of any one commodity: thus, the maintenance of any particular percentage relationship (parity ratio) between the price of a commodity and the prices paid index by a price support system (commodity loan rates) does not ensure the desired objective of maintaining producers' purchasing power in terms of some earlier period.

The base year of the parity index should be representative of the kind of agriculture likely to be experienced in the years ahead but practical limitations involved in revising parity index weights almost inevitably mean that the weights in use at any particular time are out of date.

Parity prices measure only the price of input items in the base period, and thus do not take quantity changes which have occurred since then into account: this means that parity prices do not take into account the important changes in input/output relationships which occur over time.

It will be apparent from the above and our discussion of guaranteed prices for wheat that both systems are defective in terms of resource allocation, income distribution and effects on other industries. However, guaranteed wheat prices have not (yet) led to the production of unmarketable surpluses. This may be mainly attributed to the following:

Guaranteed prices in the past have not been fixed high in relation to
market prices (they have mostly been lower).

. wool prices have been relatively more attractive than wheat prices.
. the fortuitous emergence of wheat markets in Mainland China and Russia.

If, in the future, guaranteed wheat prices turn out to be relatively high, i.e. above the free market price of wheat, and high relative to wool prices, the prospect of surplus production will, depending on market outlets in Mainland China and Russia, be very strong. In this regard the wheat scheme has a "built-in" device to discourage over-production in that the guaranteed price is related to a defined quantity of production. However, this would not, in the first instance, deter any incentive an individual producer might have to expand because through the pool system of averaging returns his increment of revenue from an additional unit of production would be greater than the price of the product in the free market. The device does, on the other hand, limit the potential cost to the Treasury of guaranteed prices and ultimately, through it, expansion of production would be checked as the fall in average returns became significant.

The Australian policy would seem to have advantages in that each scheme is of only five years' duration and could, before renewal, be radically changed if circumstances warranted this. In addition, costs may be flexibly defined.

As regards the broad objectives of the policies viz., reasonable producer incomes, parity prices, in failing to take "other" income
earned by producers into account, does not give a sufficient indication of producers' true income position. The wheat cost formula, on the other hand, could be regarded as notionally reflecting other farm activities, e.g. the owner-operator's allowance is related to the total farm enterprise.

Turning now to conceptual aspects of the respective price formulae it might be said that each has its own grave shortcomings: parity prices have the above-mentioned ones as well as those inherent in price indices; unit cost figures, on the other hand, cannot be regarded as being reliable because no satisfactory method of handling the problem of common costs on mixed farms has yet been developed and there is also the problem of definition of costs.

Thus, to achieve a common social objective of reasonable incomes (income parity) the two systems of price stabilization employ quite different devices neither of which can be regarded as being either conceptually or operationally satisfactory.

With regard to the broad aspects of the two systems we have established above that both involve social costs and that it is a matter of political judgment (or expediency) whether, in pursuit of the objective of reasonable producer incomes, these costs are justified.

Criteria commonly used in such judgments include the importance of agriculture in the economy, its contribution to export income earnings and the maintenance of stable prices for domestic consumers. We may
conclude this section with a brief reference to each of these.

As to the relative importance of agriculture Whetham (1) has indicated that in the U.S. and Australia these sectors are small. Dunsdorf (2) has calculated that the contribution of the wheat industry to national income was 5.64% in 1947-48 (reflecting a big harvest and high prices) but in view of the subsequent relative drop in wheat prices and the high growth rate in the industrial sector, the proportion must be very considerably lower now. Indeed, as Whetham points out, it is the relative smallness of agriculture that makes costly support systems possible.

As to agriculture's contribution to export income earnings it would be singularly inappropriate if there were a fundamental balance of payments problem, to single out one or a few particular industries for financial support because, in such circumstances, a general restructuring of domestic and external price relationships would be warranted.

Finally, as to consumer interests, Brandow (3) has suggested that the strong propensity for output to expand under support prices has provided ample protection for U.S. consumers. In Australia, as we have seen, the consumer has fared well under wheat price stabilization.

(1) E. H. Whetham, op. cit. p.142.
(3) G. E. Brandow, op. cit. p.177 et.seq.
PART II

APPRAISAL OF COST CONCEPTS AND METHODOLOGY IN THE ASSESSMENT OF THE COST OF WHEAT PRODUCTION IN AUSTRALIA
The Farm Survey

The process of assessment of the base cost for a wheat stabilization scheme is initiated by the collection of data from a representative sample of farmers by field survey.

The survey is preceded by a statistical study of the population to determine the size of sample required for a given order of accuracy in both the regional and national results.

The 1957/58 survey related to farms growing more than 100 acres of wheat in the year 1955/56, a year chosen because it was not affected by drought or flood and for which special statistical tabulations were available. By excluding growers producing less than 100 acres of wheat the sample was restricted to 63.4% of the total number of holdings growing wheat although these accounted for 92.7% of the total acreage under wheat in that year. However that this did not lead to non-representativeness of the sample, was indicated by a check of the sample for representativeness against population data on the distribution of wheat farms by States, by farm size and by area under wheat. These checks indicated that the sample conformed reasonably well to the population overall and closely in respect of the distribution of the sample on the basis of wheat acreage; in the latter case the difference being no greater than could be reasonably expected to arise from sampling errors. It may therefore be concluded that the survey sample was representative of the population. This is perhaps a little surprising in view of the relatively large number of farms, 571, which had to be rejected in the process of selecting the sample target of 400,
stratified by States, since it implies that no significant bias was introduced into the sample as a result of rejections or, put another way, the rejected farms did not constitute a cost class not reflected by farms included in the survey.

It is evident from this that careful attention is paid to sample representativeness by the Bureau of Agricultural Economics in its surveys. However the lack of comprehensiveness and accuracy of farmer's records necessarily has some effect on the accuracy of survey results since the exclusion of all such farms would otherwise mean a very high rate of rejections from the sample which would in turn be likely to introduce a significant amount of bias. On the other hand it can be argued with considerable force, that the major costs items are not dependent for their accuracy on farm records.

When survey data have been collected they together with imputed cost elements are processed (including "indexing forward" to the first year of a proposed stabilization scheme) into a weighted average cost figure for the industry as a whole.\(^{(1)}\) Subject to its review by a Committee consisting of the Director of the Bureau of Agricultural Economics, the Secretary of the Australian Wheat Growers' Federation and a representative of the Australian Agricultural Council and with the approval of the Minister in consultation with State Ministers this cost becomes the guaranteed price for the industry for the first year of a stabilization scheme. For the duration of the scheme this base cost is adjusted forward each year by means of a weighted price index of the Laspeyre's

\(^{(1)}\) This processing technique is demonstrated in Appendix II in respect of the third wheat industry stabilization scheme.
The resulting figures, after examination by the Wheat Cost Index Committee and with the approval of the Ministers, become the guaranteed prices in their respective years.

Data Processing Procedure

The basic steps involved in transforming farm survey data into a unit cost of production figure may be illustrated diagrammatically thus:

```
Farm Survey Data : Imputed Cost Elements

Valuation of Farm Assets

Farm Cost/Expenditure Data

Investment Outlays  Production Costs  Living Expenses

"Sideline" Costs  "Mainline" Costs

Yield Divisor

Unit Cost
```

As the diagram indicates imputed elements are also used in the process of conversion of raw farm survey data into farm cost and/or expenditure data. Capital expenditures (which are reflected in asset valuations) must be eliminated when they have been included in incurred costs and likewise living expenses. We then have total farm production costs identified. The next step is to split these production costs as between wheat production on the one hand and other (sideline) production on the other. When the wheat costs have
been isolated, an appropriate yield factor is applied to them to convert them to a unit basis. The resulting costs are used as weights for the construction of a price index of cost items for the purpose of measuring (as a best approximation) the movement in wheat costs in respect of each year of a stabilization scheme.

Industry Average Cost as a Cost-basis for Price

It was indicated above that survey cost data are processed into a weighted average cost figure to indicate the cost position of industry as a whole. Such a measure is justified because conceptually if all producers were simultaneously in long period equilibrium their average cost of production (including land rent) would be equal to their marginal cost which in turn would be equal to the (equilibrium) price and thus the average of producers' costs would yield an acceptable cost figure for the industry as a whole. That, in fact, survey data reveal a wide range of cost experience is mainly due to variability in the climatic conditions experienced by individual producers in any given period as farmers' outlays (except for harvesting costs) tend to be the same for all levels of yield: thus those who experience relatively favourable conditions would, cet. par., have lower costs of production than those who experience relatively unfavourable conditions. In addition, in any particular period actual yields for the industry may be higher or lower than expected yields. Ideally therefore we should endeavour to obtain a cost figure which does not reflect this uncontrollable factor in production.
Such a figure is the unit cost the producer expected; this could be taken to be expected total cost divided by expected yield. Expected yields are known (both regionally and nationally) and, given that the cost of a representative sample of producers may be obtained by survey, expected total costs could be computed by adjusting the average actual costs to reflect estimated unit cost on the basis of the expected yield.\(^1\)

We could expect that if such a calculation could be carried out on a farm-by-farm basis the true range of cost experience of producers would be shown to be greatly less than surveys suggest. However for other reasons e.g. the different notions of different producers as to costs and the deficiencies of survey data due to the notoriously poor records of farmers, we should still expect some variability in cost experience notwithstanding that there is some tendency for each of these – particularly the deficiencies of survey data – to be self-balancing.

On balance it appears that the use, by a price fixer, of a weighted average cost figure based on survey costs adjusted for expected yield to obtain a guide to industry costs, would be justified.

It is frequently argued that if prices are set to cover the average cost of production, half of the producers would have higher than average costs.\(^1\) But this argument relates to unit costs based on actual yields, whereas, as we have indicated, unit costs should be related to expected yields. If unit costs based on expected yields showed significant

\(^1\)See, e.g., G.S. Shepherd op. cit. p.181
dispersion and this were due to different levels of efficiency on farms then averaging of costs would yield a price which would (desirably) tend to encourage the low cost (efficient) and discourage the high cost (inefficient) producers.
Imputed Elements in Wheat Costs

The following cost items in the wheat cost of production formula embody imputed elements.

Owner-operator's allowance
Family labour
Return (Interest) on farm capital (including working capital) in respect of
(a) Basis of valuation of capital, and
(b) Rate of return (Interest)
Depreciation
Seed

The use of these imputed elements in the wheat cost formula is explained under their respective headings.

Assessed wheat costs of production are also influenced by Government policy decisions in respect of-
(a) the basis ("sideline" criterion) used to apportion farm costs as between the different farm enterprises and,
(b) the basis (yield per acre) used for determining unit costs of production.

The existence of imputed elements in a cost formula for establishing a guaranteed price stems logically from the objective of ensuring reasonable income levels for producers. To achieve this the guaranteed price would need to reflect a return to each resource used in the productive process equal to its marginal value product in industry at large irrespective of whether in the industry to be stabilized, the M.V.P. of the resources, based on market forces, were lower. Assessment of such rates is comparatively uncomplicated since there is a considerable amount of data available on current earning rates of different classes of capital and labour.
The use of historical records of such incurred costs as hired labour, contract work, fuels, fertilizers, maintenance, etc., are of course essential in a cost formula as the best guide to these costs in the future. For well known reasons historical or recorded costs of family labour and seed often understate their real cost and unless suitable imputed costs are substituted for these incurred costs, the cost on which prices would be based would be unrealistically low and thus the objective of ensuring a reasonable income to the producer would be thwarted.

Valuation of Farm Assets

Land:

In the first two stabilization schemes, the basis used for the valuation of land was "long term security value", this was approximately 75% of the market value.

In the third Stabilization Scheme, the Government accepted "fair market valuation" as the basis for valuing land and its improvements.

As indicated earlier this latter basis for valuing land for use in a cost formula for determining price is essential to achieve the policy objective of income parity for farmers notwithstanding that it may otherwise have unfavourable economic consequences.

Plant and structures:

The basis for the valuation of plant was original cost (actual or estimated) in each of the stabilization scheme. Theoretically, the valuation basis should have been replacement cost less depreciation. The effect of using original costs (as the valuation basis) is, in general, to understate replacement costs in periods of inflation (and vice versa).

Original cost less depreciation was the basis used to value structures in the first and second stabilization
schemes; in the third scheme the theoretically desirable basis of replacement cost less depreciation was used.

Livestock:

In the first two schemes it appears that valuations allowed by the Taxation Department were adopted. The Department while allowing flexibility in the choice of a basis of valuation nevertheless insisted on consistency in the use of a basis once it had been chosen by a producer. In consequence, survey data revealed different valuation bases on different farms; as an example of this, the values of livestock, notably natural increase, were found to be purely nominal in the tax records of some farmers. As a result, these valuations exercised a downward bias on gross cost assessments. In the third stabilization scheme values were based on survey farm records of purchases and sales. In the period of purchase and sale (i.e. in the survey period) these were, in effect, replacement values and thus consistent with theoretically desirable practice.

The use of these values unchanged throughout the course of a stabilization scheme (the existing practice) is justified on the basis that because of the use of the sideline cost deduction method wheat costs would vary with changes in livestock values. But this is incorrect because a change in livestock values would create (sideline) income identical in amount, thus leaving net wheat costs unchanged if the sideline deduction method were correctly applied. Thus, although it would have no effect on wheat costs, formal correctness in costing procedures would seem to require that livestock be valued on the basis of current market values.

Working Capital:

Working capital may be described as a liquid asset which complements physical capital: it arises out of outlays
made on account of inputs required for the production process, which are not of a capital nature: it is absolutely essential in the economic conduct of any industry and its supply price is an economic cost of production.

Unfortunately, it is impossible to obtain reliable data from farmers on working balances required in the conduct of their enterprises because their balances on private account cannot be disentangled from their balances on business account. Of course, even if it were possible to identify balances on business account, it would still require further judgement to decide whether these balances were higher or lower than would ordinarily be required.

In the third stabilization scheme, the amount of working capital required by the average wheat grower was related to the first advance, viz., 10/- per bushel, made by the Wheat Board in respect of wheat of a season delivered to the Board's receivers.

As average production on survey farms from which the base cost data for the third stabilization scheme were derived was 6,561 bushels, this meant that total outlays were assessed at £3,280. It was further estimated that the average period between outlays and receipt of the first advance was 6 months and thus that the average level of working capital required over the year was £1,640.

The main objection to this method of assessing the level of working capital requirements is that it is based on the arbitrary figure of 10/- per bushel.

The most accurate way of handling this item would appear to be to make an assessment based on the average period of outlay in respect of each production cost. (1)

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(1) There is no hard and fast way of handling sideline costs in this respect; probably direct arbitrary division of each cost would be adequate in most cases.
excluding only depreciation and return on equity. All or at least a large part of the owner operator's allowance should be included because farmers must inevitably make drawings from their business account to finance their daily living expenses \(^{(2)}\). The average level of outlay (i.e. working capital requirements) is then given by the aggregation of the outlays in respect of each cost item weighted by the period it is outlaid.

The period of outlay in respect of each cost item is the interval between the date of the outlay and the date of the sale of the crop, it being clear enough that any particular outlay can only be recouped upon sale of the commodity in respect of which the outlay was made. As virtually all wheat marketed is pooled and as sales from the pool are made intermittently throughout the "marketing" year (which is the twelve month period following the "production" year), it is not readily apparent which date should be taken as the sale date. Conceptually, the appropriate date is given by the weighted average sale date. This may be computed using the formula

\[
\frac{\sum_{i=1}^{N} W_i T_i}{N}
\]

where \(T_i\) is the number of days between the beginning of the marketing year and the date of each sale. \(W_i\) is the volume of wheat in each sale and \(N\) is the number of sales. This of course could not be calculated until the last sale of a pool had been made; however, as the cost is required at the beginning of the marketing year, it is obvious that it would have to be estimated - it should therefore be based on sales expectations which would normally have reference to recent

\(^{(2)}\) On this point, Bellerby op. cit. p. 209, says that almost as much reserve may be required to maintain a farm family till cash is received from the crop as to pay wages to an equivalent labour force for the period.
If working capital requirements and thus their cost were to be assessed in the above manner, it would become necessary to eliminate from costs that part of the item, interest on borrowed funds, which related to the cost of working capital.
Allocation of Costs

As indicated in the diagram above, farm costs and/or expenditure data which is derived from basic survey data and imputed costs elements have to be separated into three components: viz., investment and living expenditures and production costs.

Investment Expenditure:

When considering investment in the context of cost allocation it is of course necessary to refer to gross investment. This may relate to either the improvement of and/or addition to land, and the replacement and/or addition to structures, plant and livestock.

The objective is to identify all components of investment expenditure and eliminate them from the survey expenditure data. Some items are simple to identify, for example, additional or replacement plant and livestock and additional land. Additional structures can sometimes be clearly accounted for, but it is the rule rather than the exception for farm producers to participate with their labour, skills and other equipment in the restoration of and additions to structures. When this happens investment expenditure tends to be understated and production costs overstated, that is, with indistinguishable components of investment because it is virtually impossible to obtain anything like complete data on investment as farmers are unable to accurately assess for themselves how much of their economic activity is devoted to production and how much to development. This applies with special force to land improvements.

In cost surveys, allowance is made for that part of the incurred costs which can be identified as investment expenditure although it has not been the practice to charge any part of the owner-operator's allowance to development costs. This treatment of the owner-operator's allowance introduces an upward bias in production costs.

Living Expenditure:

Data on incurred costs are obtained from farmer's tax records. These records show the division of the allowance for
depreciation of motor vehicles as between living expenditure and production costs, but no other items are specifically divided in this way, and except for depreciation\(^{(1)}\), the costs as they appear in tax records are accepted as genuine farm production costs.

Self-Provision on Farms:

As it is normal for farmers to "live off the land" to at least some extent, i.e., by providing in whole or in part their own milk, butter, eggs and meat, etc., it is theoretically desirable to assess the extent to which production costs are affected as a result.

As no direct account has been taken of this fact in cost assessments, on the most reasonable interpretation it might be argued that the amount involved was small enough to be ignored or, alternatively, was implicitly taken into account in the fixing of the allowance for the owner-operator. Each one of these considerations contains at least a grain of truth. It would not be excessive, I feel, to place a yearly value of £150 on self-consumed farm produce (£25 eggs, £100 meat and £25 milk) and assuming, as is reasonable, that the cost of producing such produce would approximate to this value, then the effect would be to add about 7d. to net wheat costs per bushel in respect of the Third Wheat Stabilization Scheme. Short of a survey there is no way of establishing whether a cost of this order is correct; however, if it were and if it were taken into account in the cost formula costs in the Third Wheat Stabilization Scheme would have been some 4% lower. This suggests that the influence on costs of self-provision on farms is important enough not to be ignored in cost studies.

\(^{(1)}\) because of accelerated depreciation provisions which farmers enjoy, tax records cannot be accepted as production costs and independent calculations based on normal rates of depreciation are used instead.
Farmer's Residence:

The question of the inclusion of a farmer's residence in farm assets for the purpose of assessing return on farm capital, depreciation, repairs, maintenance, etc., almost always crops up in cost-based pricing of farm products. There is no argument that residences provided for farm employees are in fact farm assets and as such should be treated in cost formulae on the same basis as any other farm asset. Farmers' residences have, on the other hand, been excluded from such treatment although the reasons for so doing do not seem to have reflected the basic considerations involved.

Given that the object of cost-based pricing is to stabilize producer's real incomes at reasonable levels, it is, as already indicated, necessary to set a price which will cover all costs including normal return on capital employed and adding to this aggregate of costs an allowance for the producer's own labour and managerial skill. As this allowance, familiarly known as the owner-operator's allowance, is based on the opportunity cost principle - the earning rate for comparable labour and management in industry generally - it will, in effect, have implicitly taken housing rental into account since a wage ordinarily provides the means by which wage earners acquire, according to their scale of preferences, their accommodation. Clearly then the cost of farmers' residences should not be incorporated in our cost formulae when the owner-operator's allowance is calculated in the above manner.

Production Costs:

Once investment and living expenditure have been eliminated from cost/expenditure data, the residual represents total farm production costs. These costs cover all farm production activities and invariably relate to more than one farm commodity. To assess the cost of producing any one particular farm commodity, it is necessary to allocate to this commodity a part of those costs which are common to the production of one or
more of the other commodities produced. However, this task of allocation is almost certainly the most intractable problem in farm costing and is one that cannot be avoided by choosing only farmers specializing in only one commodity because, in respect of the wheat industry, this class of producer has virtually disappeared from the farm scene.

On this latter point, the Wheat Cost of Production Committee had this to say:

During its investigations the Committee only discovered one farmer whose sole product was wheat. With this exception the wheat farmers in Australia whom we interviewed or from whom we had returns were in a position to derive very considerable revenues from wool, mutton, or fat lambs, or from other cereal crops, and many had other sidelines such as peas, potatoes, dairy produce. We are satisfied that the pure wheat farmers have ceased to play any part in the production of wheat in Australia(1).

Allocation of Costs of Production:

In each of the three post-war wheat stabilization schemes, the so-called "side line deduction method" which is based on the premise that normally side line cost is equal to sideline income, was used for the purpose of cost allocation.

Under this method costs are allocated as between the main and sideline activities according to some judgment as to the relationship that sideline income bears to sideline costs in the survey period. In this way, the problem of allocation of common costs as between one product and another is sidestepped but as we shall see at considerable cost in terms of accuracy.

In respect of the first stabilization scheme, the Wheat Cost Production Committee had before it an assessment that prices of sideline products were 17½% above expected prices in the longer term when by definition the industry would be in equilibrium again and thus costs would again be equal to prices.

As the Committee considered that costs, in the survey period, were 2% above costs in the pre-survey period, it concluded that sideline income was about 15% (i.e. 17% - 2%) above sideline costs in the survey period and on this basis assessed sideline costs at 85% of sideline income.\(^{(1)}\)

In effect, in respect of the survey period, the Committee related an index number of costs on a pre-survey base to an index number of prices on a post-survey base. Now the only way in which these index numbers can be related is by assuming or establishing some sort of relationship between the two base periods. As the Committee did not establish any statistical relationship its conclusions must be taken to imply the following assumptions, viz:

- that (sideline) costs equalled income in the pre-survey period with the industry in (long period) equilibrium; and
- that when equilibrium is restored again in the future, costs and prices will again be equal at their pre-survey period levels.

The first of these assumptions, as it turns out, is the same as the basic assumption inherent in the sideline deduction method.

However, on theoretical grounds, neither of these assumptions can be justified and must be held to be unacceptable. In dynamic economies long period equilibrium is an objective which is never attained before changing economic and technical conditions define new equilibrium conditions. Such changing conditions are reflected in the conditions prevailing in Australian agriculture in the late 1930's, the pre-survey period to which the Committee referred.

\(^{(1)}\) Wheat Cost of Production Committee Report, para. 21. Actually it would have been arithmetically more proper to have worked from the ratio 117:102 which gives sideline costs as 87% of sideline income.
Further, costs in a defined short period can never be accepted as representing long period equilibrium costs because of the effects of short period influences on costs, as, for example, seasonal conditions which would almost certainly be either better or worse than average experience in the long run.

It therefore appears that as a result of the Committee's method of determining sideline costs, there is an (unknown) error which could be large and significant in the resulting wheat cost figures. This much may be said: if, in the pre-survey period, sideline costs were greater than sideline income (as seems possible) and not equated with sideline income as assumed, the effect would be to underestimate sideline cost and, as a result, over-estimate assessed wheat costs; and vice versa.

Apart from the objections on theoretical grounds to the determination of sideline costs by the sideline deduction method, the method is revealed as having further shortcomings in respect of the application of the sideline cost figure to gross costs to determine net wheat costs. This is because the method subsumes:

1. that the imputed rate of return on all capital (including sideline capital) is the same as the historical (survey period) rate of return to which the sideline income and sideline cost data relate; and

2. that the imputed owner-operator's allowance is the same as the actual return to the owner-operator in the survey period.

Clearly, however, these subsumptions (which relate to the two biggest items of cost) could not possibly be expected to hold; it follows therefore that net wheat costs cannot be taken to be the difference between gross costs (which are to an
important extent imputed) and sideline costs (which are based entirely on historical data). In other words the sideline deduction method cannot be held to be an acceptable basis for allocating costs between different farm activities.

In the second stabilization scheme the concept of sideline costs underwent a radical change. Whereas in the first scheme, it was defined in the economic sense which includes normal profit, in the second scheme it was defined in the narrow commercial sense, which excludes (all) profit. The weakness of such a concept of sideline costs may be illustrated arithmetically as follows:-

Assume gross cost (including normal profit) is 110, normal profit being 10 units.

Assume further that sideline enterprise comprises one-half of total farm activity. We then get sideline costs 55 and net industry cost 55. Both of these figures include normal profit (equal to 5 units). Sideline cost (excluding profit) is thus 50, which is the figure that theoretically would be arrived at via the side-line deduction method and which would then be deducted from the total cost of 110 to obtain net industry costs. But clearly this is wrong for it leaves the imputed profit in respect of sideline capital in this residual (net cost) figure. In other words net (wheat) industry costs are loaded by the imputed profit (return) on sideline capital.

The effect of the above on the assessment of wheat costs is considerable. In the 1958/59 season, for example, the item, Interest (Return on Farm Capital) was assessed at 67.18d per bushel (gross cost basis). The industry structure is such that more than half of gross costs is allocated to sideline enterprise. (1) If we assume (and very broadly, it is plausible to do so) that the capital-output (or income) ratio is the same

(1) Sideline income was rather more than 50% of total farm income.
for each farm activity(1) then more than half of the "Interest" item applies to sideline activity. On this basis net costs were more than 33d. per bushel lower than assessed.

Apart from the above weakness, the concept involves the same two theoretically unacceptable subsumptions inherent in the concept of sideline cost as used in the first scheme, and in addition a third one, namely:

- that the imputed cost of family labour is the same as the actual return to family labour in the survey period.

In the consideration of sideline costs in the second scheme, it was also supposed that changes in wool prices would cause an apparent change in the cost of producing wheat, thus

"Nevertheless, to load all the profit from wool (and other sidelines) against wheat would be inequitable and would lead to the situation where a change in wool prices and hence in the profitability of producing wool, would cause an apparent change in the cost of producing wheat, even though there might have been no change in the prices of the factors of wheat production."

This is erroneous for assuming the method could be adapted to assess sideline cost on the same basis as gross cost was assessed, the method would not be invalidated by subsequent changes in prices of sidelines and its use over the course of a stabilization scheme could be justified as follows:

We may take as our starting point the total cost(2) of the average farm (this implies individual costs cannot be separately allocated which in itself is mainly true). We need a means for allocating costs between main and sideline enterprises. We know sideline income. We assume (correctly, say) that there is normal profit (return to capital) and normal

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(1) That is to say, if sideline capital bears the same relation to total capital as sideline income bears to total income.

(2) defined to include normal return to capital and labour.
returns to labour in respect of sidelines. Therefore sideline cost defined to include normal return to capital and labour equals sideline income. The relationship of sideline cost (so determined) to total costs gives us a factor with which to allocate costs between farm enterprises.

If costs and prices remain stable and there is no structural change, i.e., the composition of inputs and outputs is unchanged then clearly a cost allocation factor, once determined, holds good.

If costs remain stable and prices change (in any direction and by any amount) but there is no structural change, the cost allocation factor continues to hold good. This is necessarily so as the cost level and each individual cost item (reflecting the farm structure) is exactly as in the base period. Thus, having once determined a cost allocation factor, its continued validity depends solely on the matter of structural change - if there is no structural change, the factor retains its validity.

Thus, if costs change, prices remain unchanged and there is no structural change (which means cost must change uniformly in relation to each farm activity) the cost allocation factor, continues to be valid.

Likewise, if costs and prices both change and there is no structural change (which again means costs must move uniformly) the cost allocation factor is still good.

(1) If costs do not move uniformly then immediately there is a structural change in industry costs and the Index Method becomes invalid. In practice minor structural changes via differential changes in cost items are occurring all the time, but until these in the aggregate become significant the Index Method for all practical purposes retains its validity.
In general, then, the cost allocation factor retains its validity between one survey and the next, assuming the latter survey is held as soon as necessary, i.e., following a (significant) structural change in the industry.

The validity of the above reasoning, namely, that in any period subsequent to the base period, the use of the base period cost allocation factor is valid and that it returns precisely the same results as are obtainable by reference to changes in (and hence new assessments of) sideline profitability, may be demonstrated arithmetically as follows:

In period 0 we have: Gross Cost = 100, Sideline Income = 40, Sideline Cost Assumption (sideline cost = sideline income) therefore Sideline Cost = 40 (therefore sideline cost allocation factor \(\frac{40}{100} = 0.4\)), therefore net cost = 60.

In period 1 we assume costs rise 10%. The present method then gives: Gross Cost = 110 to which the application of the cost allocation factor (0.4) gives sideline costs = 44; therefore Net Costs = 66. An identical result is given by assessing net costs in period 1 according to the method used in period 0. Thus: assessment of sideline profitability in period 1, in the light of higher costs and unchanged prices, indicates that sideline production now involves a loss. We assume (correctly, again) that we are now making a 10% loss; therefore sideline cost now equals 110% of sideline income which is unchanged at 40; therefore sideline cost equals \(40 \times 110\% = 44\). Therefore net cost equals \(110 - 44 = 66\) as given by the present method.

These exercises may be repeated in respect of all combinations of price and cost changes, but in the absence of structural change and so long as the relationship of sideline cost to sideline income can be assessed accurately in the first place, the use of the base period cost allocation factor will
always be found to be correct.

If, however, sideline profitability were incorrectly assessed in the base period, the resulting cost allocation factor would, of course, be incorrect in respect of all periods including the base period.

In its report on the 1950 Wheat Survey, the Ad Hoc Wheat Cost of Production Committee alluded to the residual values of fertiliser which accrue to wool production as a result of the consumption of wheat stubble by sheep. This matter was also cited by the Wheat Cost of Production Committee in its report on the 1957 Wheat Survey, as an example of the difficulties of allocating costs to different farm activities.

Whilst there can be no denying that there are costs for which it is practically impossible to make allocations between different farm activities, it seems that the choice of the above one is inappropriate in the circumstances. Generally speaking, in Australia, wheat producers apply what could be termed as traditional quantities of fertilizer to wheat lands. Over the years farmers are known to have experimented on test plots or strips with different rates of fertilizer application and apparently they have satisfied themselves that existing rates are best. One particular problem militating against higher rates of application is the low moisture content of the soil. Relatively high rates of application of fertilizer have been found to cause the wheat plant to grow to such a size as cannot be sustained by the relatively low moisture content of the soil in the later stages of growth. In other words, it is not the practice of producers to apply a "little extra" for the benefit of the sheep. Insofar as this is true, then it can be said that it is the producer's intention to apply fertilizer solely in respect of his planned wheat crop and thus that all the fertilizer should be regarded as an input for this wheat crop. If some fertilizer is lost due to wind or if an undue amount is leached away due to excessive rain, these quantities
do not cease for these reasons to be costs; and, in the same way, unintentional residues of fertiliser left in the soil do not cease to be direct wheat costs. But this does not deny that they may still reduce costs of wool production.

In 1958, the Wheat Cost Committee gave still further consideration to the sideline deduction method. Its observation that "it is quite adequate as a method for determining the structure of costs as a basis for assessing movements in total costs in succeeding years" is an inaccurate one for the method has nothing to do with the determination of the structure of costs. The observation made by the Ad Hoc Committee in its report on the 1950 Wheat Survey on the effect of changes in wool prices was repeated in the 1950 survey report; thus "If the price of wool, for example, is particularly high in any one year, then the deduction from gross costs is so much higher and the residual representing wheat costs is correspondingly low".

However, as pointed out above, this observation is erroneous. The Committee's further reference to a not unreasonable price expectation of 70d. seems to be quite irrelevant to the matter in hand.

The Committee observed that "the adoption of an appropriate rate of profit on sidelines tends to make the sideline deduction method more realistic" and "profitability may be expressed as a ratio between total gross returns and total gross costs". "The ratio for a rate of profitability of 10% may be written as \( \frac{110}{100} \); that is to say, total gross returns are 10% higher than costs".

As in the second stabilization scheme, this concept of sideline costs is inadmissible because it relates profitability to output and sales rather than to capital and thus makes the resulting cost noncomparable with gross...
costs, in which "profitability" is related to capital. The concept is also deficient with respect to the subsumptions of the sideline cost concept noted in respect of the first two stabilization schemes.

In its consideration of profitability of sidelines, the Wheat Costs Committee worked from the profitability ratio used in the 1950 Wheat Survey Report, namely, ratio of gross sideline income to gross sideline cost which was assessed at \( \frac{110}{100} \). The Wheat Cost Committee then applied to the numerator of this ratio on the one hand, the change in gross returns for sideline items (for all industry) during the 1950/57 period and to the denominator on the other hand the change recorded by the Index of Prices Paid by Farmers during the same period. The resulting ratio was then taken to indicate the rate of profitability of sidelines in respect of the 1957 survey.

In adjusting the numerator of the ratio, which it used as a starting point, the Committee took account of changes in both volume and price. However, in adjusting the denominator it took account only of price change, that is to say, the Committee made no allowance in its calculations for the increased inputs which complemented the increased output, and thus ascribed the total increase in output entirely to increased productivity. The Committee did in fact indicate this short-coming and pointed to evidence of striking increases in some inputs but gave scant weight to these indications in its overall assessment.

In the circumstances, more accurate figuring would have resulted had the numerator of the commencing ratio been adjusted with respect to price change only. As the prices of sidelines increased only about 44% over the period a very much different "profit" rate would have been obtained. In fact, a "loss" rate of almost 20% would have been indicated.

These results would have implied a productivity factor of nil for the period, instead of an average annual productivity factor of over 5% per annum given by the Committee's
calculation. As actual production increased by 14% (about 2% per annum) in the period under reference, then clearly there would have had to have been a dramatic reduction in inputs to have given the figures some order of respectability, but this is entirely lacking for the evidence indicates an unmistakable increase in inputs. In other words, the productivity factor though almost certainly positive could not nearly have had the influence implicitly ascribed to it by virtue of the Committee's conclusions.

In the light of the foregoing there does not appear to be any justification whatsoever for the use of the sideline deduction technique as a method of allocating costs between different enterprises. This being so, the question arises: what is the best feasible way by which costs may be allocated? More research is required to answer this question, but material already available suggest that several methods could be developed that would be more accurate than the sideline deduction method.

Kinsman(1) experimented with regression analysis as a method of allocating costs. He found that the relationship between gross cost per bushel and sideline income per bushel gave a "remarkably good fit to a straight line". On the basis of this relationship, he was able to compute gross farm cost as a measure of net wheat costs when sideline income was zero.

However, it became apparent to Kinsman that wheat costs computed in this way would only be valid for farms with high yields per acre and that "unless one was prepared to accept the cost of producing wheat on high-yielding farms as the cost of production, it was necessary to find some alternative solution."

He then tried partial regression analysis using different sets of variables and concluded from this work that it should be possible to arrive at a reasonable allocation of costs on mixed farms by such methods.

Standard costing is another line of enquiry which deserves earnest consideration. Various forms of this costing basis are in use in European countries\(^1\) and they appear to be vastly superior to the sideline deduction technique as a method of allocating costs. In terms of policy objectives, the more we reorient price determination from a purely "found" cost of production basis to an acceptable efficiency level basis, the more the notion of standard costs commends itself. As Saxon\(^2\) has pointed out, the efficiency standard, to give it acceptability, could be one agreed to by growers' representatives.

Some valuable exploratory work on estimating wheat costs of production in Australia on a standard cost basis has already been carried out by McLennan\(^3\).

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\(^{1}\) See, for example, E.A. Saxon : Farm Records and Their Importance for Management and Policy, Quarterly Review of Agricultural Economics, July, 1961 and January, 1962.


\(^{3}\) L.W. McLennan : Estimated cost of wheat production per bushel, Bureau of Agricultural Economics (unpublished paper).
Yield Factor for Conversion of Total Costs to Unit Costs

Total farm cost less costs attributable to sideline enterprises gives total wheat costs. As price is set on a unit of production basis, these costs must also be expressed on a unit basis. Unit costs and thus price (in cost-based pricing) are, of course, powerfully affected by the choice of the yield divisor. Thus to use a yield factor which is higher than expected future yields and which would in turn make assessed costs lower than producers expected, would cet. par., tend to discourage production because producers would not then expect the resulting (cost-based) price to give an adequate return on their labour and capital. And vice versa. It follows that to achieve industry stabilization unit cost of production (and thus the guaranteed price) would need to be calculated on the basis of expected yields.

Variable seasonal conditions are the major cause of year to year fluctuations in yields. In this regard there is a probability of a calamitous drought one year in twenty, of a moderate to severe drought one year in four or five, as well as the respective probabilities of average, good and excellent seasons (and any other category of season not mentioned). Quite clearly farmers' yield expectations must be related to these probabilities. Accordingly, in the determination of industry's average yield expectations reference is made to yield experience over a past period long enough to reflect the effects of the full cycle of seasonal conditions.

In this respect the actual yield experienced by survey farms in the survey years is not regarded as adequate for this purpose because the survey period is too short to typify farmers' average yield experience and thus their expectations.

Yield Expectations:

Let us assume that the complete "cycle" of farmers' yield experience (ranging from best possible to worst possible)
takes 20 years (in fact this time span roughly accords with actual experience). Assume also that there is no trend in yields. It follows that the (statistically) expected yield must be the (simple) average of the average yields of the past 20 years. If, on the other hand, there is a trend (let us say upwards) in yields, then obviously average past performance will not give the statistically expected yield for any future season. In fact, when there is trend in yields, as indeed there has been over a very long period of time, the statistically expected yield will be different in each future year. Thus, assuming that yields have been increasing in arithmetic progression and this trend is expected to continue, then the statistically expected future yields will rise in the same arithmetic progression.

It will be noted that we are discussing statistically expected yields rather than the notional (weighted) average of farmers' individual yield expectations. The reason for this is that the two are not likely to be identical. If there has been a rising trend in yields over a long period, farmers are likely to become less optimistic about the trend continuing particularly if unanticipated technological factors affecting yield are involved (in this regard, for example, myxomatosis and new higher yielding wheat varieties). Also some farmers (and it is farmers who make the production decisions) are not beyond speculating on the season and whilst in this regard optimism would be likely to be mixed with pessimism (or vice versa) one would not necessarily expect a perfect balance between the two.

In respect of the first stabilization scheme, the Wheat Cost of Production Committee determined its (reasonable) unit cost of production figure on the basis of actual survey
yields\(^{(1)}\). This necessarily implies that the Committee considered that yield experience in the survey period was typical of average experience for otherwise the assessed cost figure could not be described as reasonable outside of its reference period. In fact, the survey yield figure (11.95 bushels) was about 3\% higher than the previous 20 year average figure for the industry as a whole and a bit less than 1\% higher than the 10 years average figure. When trend is taken into account these differences are narrowed so that the yield figure can be accepted as having valid reference to the first year (1947-48) of the Stabilization Scheme. However, if the correction for acreage bias (see footnote \((1)\)) significantly changed the average yield figure and, prima facie, this appears to be so then, to this extent, this yield figure does not have valid reference outside of the survey period which ended in 1946/47.

\(^{(1)}\) However, the sample was considered to have an acreage bias in that it was over weighted by large acreage farms. This presumed bias was corrected by weighting total wheat production and total net costs for each cost group, by the ratio of the theoretical number to the actual number of farms in each group. Broadly, this meant that the weight accorded smaller farms was increased. As there is only the remotest possibility that the weighted average yield of these farms could have coincided with the weighted average yield of the larger farms which were "Weighted" out of the sample, we must assume that the average yield after correction for acreage bias differed from the original figure of 11.95 bushels per acre. In Tables I and II of the Committee's Report, the acreage bias conversion factors in respect of total wheat production can be obtained within each cost group. These factors can be applied to the (uncorrected) acreages in Table I to give an approximation to the figure of corrected acreages. This figure, when applied to the corrected production figure in Table II of the Report, gives an approximation to the average yield figure implied in the Committee's assessment. The result is 11.8 bushels per acre.
The best fitting straight line to the average yields in the 21 year period ending with 1947-48 (the first year of the Stabilization Scheme) is \( Y = 0.08x + 11.86 \). This indicates a slight upward trend in yields. The computed yields (i.e., the statistical expectations) in respect of each of the six years of the first Stabilization Scheme averaged out at 12.86 bushels per acre which is well in advance of the actual figure used. But even this figure was well below the actual yields experienced which averaged out at 16.53 bushels.

After unit costs had been determined in respect of the first year of the first scheme, the question of how yield should be treated in the subsequent years of the scheme arose. It was suggested that estimated yields of each season might be used. This approach was rejected on what seems to me to be for the most part unacceptable grounds. It was claimed that yields varied widely from season to season (which is true in itself) and that in consequence there would be "marked changes in costs per bushel notwithstanding that costs per acre may remain relatively stable". In itself, this is a truism but it is intended to imply that there is something wrong with "marked changes in costs per bushel....." One could reasonably believe that the use of the word "notwithstanding" implied that it would not be right if unit costs varied while per acre costs were stable. But this is of course precisely what does happen when nontypical season are experienced. The point is then made that it would be undesirable from the price fixing aspect in that it would cause the home consumption price to jump around. However, this would not have been necessary at all. Certainly the producer prices would have fluctuated (inversely with the change in yields so that producers got reasonable overall returns in relation to their total costs) but the home consumption price of wheat could have been set at any arbitrary level (say on the basis of the statistically expected yield) given the enabling legislation. This would
have meant that in some years the consumer price would have been greater than the producer price and thus that the Wheat Board, as selling agent, would have paid the difference into the Stabilization Fund while in other years, when the reverse applied, payment would have been made out of the Stabilization Fund. This would likewise have applied in respect of the export price/guaranteed price differential for that part of the export crop subject to the guaranteed price. The further argument against using the estimated yield, namely, that errors in the estimate led to marked variations in costs (and then to the possibility of over-payment) can also be rebutted. This suggests growers are paid cash on delivery but in fact Wheat Pools are never wound up inside of one year by which time actual yields are known; thus the present system of making progressive advances throughout the selling season (as more detail became available) would seem to be capable of extension to cope with the problem of errors in estimated yields.

In the second scheme, four bases for assessing a yield figure were considered namely (i) a 20-year moving average, (ii) an arbitrarily increasing yield, (iii) a constant yield on arbitrary or historical bases and (iv) an annually adjusted yield.

The two things to note about these are that (ii) and (iv) do not specify a basis for determining a commencing yield and that (i) is consistent with (iv). This means that the four bases were not sufficiently defined to be clear alternatives to each other. The issues involved are, however, implicit: should the yield figure be set on an arbitrary or historical basis, should the yield be adjusted annually, and if so, should it be adjusted on an arbitrary or historical basis?
In the event the moving average was rejected for 4 reasons none of which are valid. The basic reason why it should be regarded as inappropriate is that as yields were on an upward trend past averages would necessarily understate the statistically expected yield. The first of the four reasons is that the 20 year average could rise (or fall) when the actual yield fell. This, of course, could happen, but that is not a case for rejecting it, because the same must hold true in respect of any yield figure used (other than perhaps the estimate of the actual yield). As regards the second reason that the yield would be affected by conditions of 20 years ago, the basic concept of an average has clearly been overlooked because a 20 year average gives equal weight to each one of the 20 years figures involved and as pointed out above a 20 year average would be appropriate for Australia in the absence of trend. Reason 3, that variations could be appreciable, would be utterly wrong if there were no trend (as was implicitly assumed) since the average would in fact represent the expected yield. Moreover, the variations could be expected to be self-balancing over a period so that, in the absence of a trend adjustment which was ignored anyway, the 20 year average would reasonably represent the expected yield. The final and least objectionable reason for rejecting the 20-year moving average was that it would vary each year, whereas expected yields would not. But the movement in the 20-year moving average is only a symptom of trend which by all reasonable statistical standards commends itself as a better approximation of expected yields.

Finally, the Committee adopted a fixed yield of 13.35 bushels per acre, the average of the previous 20 years. This of course ignores trend and thus on average
it could be expected to understate future yields.

The Government considered the figure too low and lifted it to 13.5 bushels per acre, the mean of the previous 20 year and 15 year average yields. This meant that yields of the previous 15 years each received a weight of 2 while a weight of 1 was allotted to the yields in each of the earliest 5 years taken into account. Whilst this could be regarded as a step in the right direction this sort of technique could never actually give the best possible assessment of the statistically expected yield. The statistically expected yield in the second scheme averaged out at 16.26 bushels per acre, which compares with the average of actual yields of 16.3 bushels per acre.

In the third stabilization scheme, the yield factor was reviewed again. The moving average was rejected for the same invalid reasons as given in the second scheme and thus not for the (correct) reason that it ignores trend. The Committee came out in favour of the mean of the 10 and 20 years (15.5 bushels) thus giving a weight of 2 to each of the ten most recent years. But as indicated above this method does not fully take trend into account and thus, cet. par., would tend to underestimate actual average yields.

In the first four years of the third scheme, the statistically expected yield averaged out at 17.77 bushels per acre which compares with the average of the actual yields of 18.54 bushels. In the table below, it will be noted that average actual yields have not co-incided with either the average of official yield figures or the average of the calculated statistically expected yield figures. Some difference in the figures would not be surprising, (1) but

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(1) Since expected and average yields need never quite balance out because of the vagaries of climate, etc.
the considerable differences actually exhibited do suggest that more than random factors contributed to this position. In the first place, the difference between the statistically expected yields and official yield figures as explained above is due to the fact that trend was not taken into account in the official figures. The difference between the average of the statistically expected yields and the average of the actual yields is also associated with trend in that there has been a fairly marked increase in the rate of increase of average yields. This, of course, points to the deficiency of describing the trend in yields with a curve of the first degree i.e. the best fitting straight line. However yields cannot be expected to go on increasing at an increasing rate and sooner or later the rate of increase, cet. par., must start to decline; when this happens estimated future yields based on the best fitting straight line would tend to overstate yields. On balance it would seem that if official yields were set each year on the basis of the statistically expected yields computed from the equation to the best fitting straight line of recorded yields they would be as much as any theoretician might desire having regard to future uncertainties concerning trend and farmers' attitudes thereto.

Imputed Yield in Relation to Harvesting Costs

It is not valid of course to obtain unit costs by dividing the expected yield figure into aggregate wheat costs because some harvesting costs, for example, harvest labour, cornsacks and wheat cartage are the same on a per bushel basis whatever the yield happens to be. To get over this problem, unit cost of production is first determined using the actual survey yield. This figure is then adjusted after first eliminating harvest labour, cornsacks and cartage by the ratio of actual yield to expected yield after which the
three eliminated items are added back at their actual unit cost in the survey period.

The chief apparent weakness in this method of adjustment is that it takes no account of the use of a farmer's own plant, fuel, etc., and labour in the harvesting process.

For example, an investigation (1) of N.S.W. survey data in respect of the 1957 Wheat Industry Survey indicates that the real cost of cartage (as one element in harvesting costs) in N.S.W. was about 7d. per bushel in the survey period compared with the figure of approximately 1d. per bushel indicated in the official cost figures. As this amount is relatively large in the context of harvesting costs, prima facie, there is a good case for attempting to take it into account also.

As regards the owner-operator's allowance, it would not be appropriate to attempt to make an adjustment because, by Government decision, the full amount of this allowance must be allowed as a cost. Whether an adjustment was warranted on economic grounds would depend strictly speaking on whether the allowance was based on itemized work value or opportunity cost. However in this context it would seem sensible and desirable to treat the allowance as if it were an overhead cost.

With respect to depreciation (of wheat harvesting and cartage vehicles) there is a more tenuous line of argument. Depreciation rates are based on average experience of the life of plant, etc., and thus, in respect of harvesting assignments covering any of a fairly wide range of yields which would of course embrace normally expected yields, the standard rate of depreciation could be taken as an accept-

(1) A.E. Cox, Bureau of Agricultural Economics, Canberra, Wheat Cartage Costs in N.S.W., (unpublished).
able approximation of the actual rate of depreciation.\(^{(1)}\)

Fuel and oil is perhaps the only other item warranting discussion in the present context. As the cost of fuel and oil used in harvesting vehicles would for all practical purposes depend directly on the size of the harvest as a function of both acreage and yield, clearly it is desirable as far as practicable to make allowance for this when converting unit costs from an actual to an expected yield basis.

\(^{(1)}\) It would of course be most unlikely for an extremely abnormal year for yields (and resulting abnormal harvesting costs) to be chosen as part of a survey period.
### COMPARISON OF ACTUAL AVERAGE WHEAT YIELDS, IMPUTED YIELDS IN WHEAT COST FORMULAE AND STATISTICALLY EXPECTED YIELDS

1947-48 TO 1961-62

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual Yield bush/acre</th>
<th>Imputed Yield bush/acre</th>
<th>Statistically Expected Yield* bush/acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947-48</td>
<td>15.9</td>
<td>12.0</td>
<td>12.66</td>
</tr>
<tr>
<td>49</td>
<td>15.2</td>
<td>12.0</td>
<td>12.74</td>
</tr>
<tr>
<td>50</td>
<td>17.8</td>
<td>12.0</td>
<td>12.82</td>
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<tr>
<td>51</td>
<td>15.8</td>
<td>12.0</td>
<td>12.90</td>
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<tr>
<td>52</td>
<td>15.4</td>
<td>12.0</td>
<td>12.98</td>
</tr>
<tr>
<td>53</td>
<td>19.1</td>
<td>12.0</td>
<td>13.06</td>
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<tr>
<td>54</td>
<td>18.4</td>
<td>13.5</td>
<td>15.80</td>
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<td>55</td>
<td>15.8</td>
<td>13.5</td>
<td>16.03</td>
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<tr>
<td>56</td>
<td>19.2</td>
<td>13.5</td>
<td>16.26</td>
</tr>
<tr>
<td>57</td>
<td>17.1</td>
<td>13.5</td>
<td>16.49</td>
</tr>
<tr>
<td>58</td>
<td>11.0</td>
<td>13.5</td>
<td>16.72</td>
</tr>
<tr>
<td>59</td>
<td>20.7</td>
<td>15.5</td>
<td>17.35</td>
</tr>
<tr>
<td>60</td>
<td>16.3</td>
<td>15.5</td>
<td>17.63</td>
</tr>
<tr>
<td>61</td>
<td>20.4</td>
<td>15.5</td>
<td>17.91</td>
</tr>
<tr>
<td>62</td>
<td>16.8</td>
<td>15.5</td>
<td>18.19</td>
</tr>
</tbody>
</table>

| Average(15 years) | 17.0  | 13.4  | 15.30 |

* Based on least squares method applied to the actual yields in the 21 years preceding the commencement year of each of the three stabilization schemes.
Return to Farm Capital

Farm assets may be briefly described as land and improvements, structures, plant, livestock and working capital. Given the value of these assets, the return to farm capital allowed will depend on the degree of equity a farmer has in these assets on the one hand and the rate of return to be allowed on the other. As regards the assets in which the farmer has no equity and which were acquired with borrowed funds or against which funds were borrowed, the return allowed is given by the cost of the borrowed funds.

The measurement of a farmer's equity in his farm is in theory a relatively straightforward matter; it is the total value of farm assets less the total amount of funds borrowed. The valuation of farm assets has already been discussed and need not concern us here. The total amount of funds borrowed could be obtained by industry survey. The interest bill paid by the farmer is usually available as a separate item and if data were collected showing the amounts of interest paid at each rate of interest, if there were more than one, it would be possible to capitalize the interest bill to deduce the total amount of borrowed capital a farmer had. Whilst this procedure would yield an accurate assessment of borrowed capital, it nevertheless would not quite go far enough because we need to know in addition to the amount of borrowed capital, the purpose of this capital. This is required to enable borrowings for working capital purposes to be separated from other borrowed capital and eliminated from costs because working capital is an item which presents special difficulties which make it necessary to compute it separately. In the 1957/58 wheat survey, the data collected on borrowed funds was almost sufficient to permit proper processing of this item.
In the first wheat stabilization scheme, the borrowed capital was estimated from interest paid by capitalizing the interest bill at the trading bank overdraft rate (as trading banks have traditionally been the main source of farmers' borrowings). This assessed total of borrowings was then deducted from the value of farm assets to give farmers' equity. Borrowed capital was then allowed as a cost on the basis of the actual amount of interest paid and return on farmers' equity was costed at a specially chosen rate - the long term bond rate of interest. It would appear that interest on working capital would have comprised some part of interest on borrowed capital.

In the second and third stabilization schemes, actual interest payments made by farmers were completely eliminated from cost tabulations and instead of the two items, return on equity and interest on borrowed capital, a single item, interest on capital, was introduced. The interest allowed on this item was the current Trading Bank overdraft rate. There are of course considerable computational advantages associated with this procedure without, it appears, any serious additional compromise with accuracy, if it can be accepted that this one rate of interest is appropriate for all farm capital. This is doubtful as hire purchase agreements have become more and more popular with farmers as a means of finance and rates of interest under these arrangements are significantly higher than trading bank overdraft rates to producers. It could however be argued that as farmers' indebtedness is only small (8%) in relation to the capital value of their farms, the effects of any inaccuracies resulting from the simplification of procedures would not be significant. This may well be true. Nevertheless, the method has a theoretical weakness in that it uses a common rate in respect of return on equity and interest on borrowed capital which may well have little or no justification in other periods of time. If, for example, the bond yield were to be
used to be used to assess the return on equity, could this rate which is mostly below 5% also be regarded as satisfactory in respect of borrowed capital, the rate of interest on which appears to have averaged over 5% p.a. Evidently not.

We turn now to discuss the rate of return to be allowed in respect of a farmer's equity in his farm. In terms of the criterion of income parity this rate should be based on current earning rates of capital. However, the modern capital market represents a bewildering variety of assets each with its own combination of those qualities (illiquidity in the narrow sense, capital uncertainty, lender's risk and income uncertainty), which put them at a disadvantage in relation to money (1); it is not therefore a simple task to decide which particular rate of return is appropriate in respect of a farmer's equity in his farm.

The farmer's position is that he is most concerned about income uncertainty, that is to say, he is interested in securing an assured reasonable income from his enterprise; he is much less concerned about capital uncertainty - the risk of changes in the value of his equity due to changes in interest rates - since as a general rule he will not be planning to sell his equity. In this respect, the farmer is in the category of an income-cautious investor, typically the holder of long term bonds; both are seeking income certainty.

What about risk? Farming enterprise is normally regarded as a high risk proposition, because of price uncertainty on the one hand and production uncertainty on the other. The risk of lower than expected returns from the sale of farm commodities is undoubtedly the major risk facing farmers today. However, under a cost-based pricing policy, this risk is entirely eliminated. On the supply side, the main risk is adverse climatic conditions. Again however the risk is eliminated by cost-based prices because of the manner, indicated

(1) Joan Robinson: The Rate of Interest and Other Essays pp5-7.
earlier, in which the yield divisor (based on expected yields) is handled in the cost formula. In any event adverse climatic conditions are certain to "balance out" in the long run.

For farmers as individuals there will still be some enterprise risks. The chief of these is probably disease, but in the overall picture it is not very significant.

Fire is a definite risk of course but this is covered in a large measure by insurance, the cost of which is incorporated in the cost formula. It is apparent then that the main risks associated with farming enterprise are eliminated by a cost-based price. It is only reasonable therefore that the return allowed on farmer's equity should reflect this fact.

We have argued above that the farmer is income cautious like the bond holder and that under a cost-based price policy he avoids nearly all the risk associated with farm enterprise. To what class of bond holder, we need to consider, does this situation apply?

In Australia, a bond holder who desires to minimize the income risks of bond holding would hold Commonwealth Government securities. The yield on these securities may therefore be regarded as the appropriate rate of return to allow in respect of farmers' equity.

In the first wheat stabilization scheme, the rate selected for return on equity was the rate of interest on long term Commonwealth loans, viz., 3.25%. This rate was slightly (3%) above the bond yield of 3.15% which we have suggested as an appropriate rate, and once a security has been selected for indicating the rate of return to be allowed on farmer's equity, there should be no question whether the earning rate on the face value of the bond or the current yield is appropriate: the only rate which is meaningful is
the current yield.

In the second and third wheat stabilization schemes, the Government decided to allow return on farmers' equity at the Trading Bank overdraft rate throughout the life of these schemes. Except for one period in 1956, this rate was in excess of the yield on long term Commonwealth bonds.

A comparison of the rate of return allowed on farmers' equity and the yield on long term Government securities is given in the following table:-
<table>
<thead>
<tr>
<th>(1) Year</th>
<th>(2) Rate Allowed in Wheat Cost Formula. %</th>
<th>(3) Yield on long term Commonwealth Bonds (a) (b) %</th>
<th>(4) Relative ((2) + (3)) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1947/48</td>
<td>3.25</td>
<td>3.15</td>
<td>103.2</td>
</tr>
<tr>
<td>48/49</td>
<td>3.25</td>
<td>3.15</td>
<td>103.2</td>
</tr>
<tr>
<td>49/50</td>
<td>3.25</td>
<td>3.15</td>
<td>103.2</td>
</tr>
<tr>
<td>50/51</td>
<td>3.25</td>
<td>3.13</td>
<td>103.2</td>
</tr>
<tr>
<td>51/52</td>
<td>3.75</td>
<td>3.51</td>
<td>106.8</td>
</tr>
<tr>
<td>52/53</td>
<td>3.75</td>
<td>4.62</td>
<td>81.2</td>
</tr>
<tr>
<td>53/54</td>
<td>5.0</td>
<td>4.48</td>
<td>116.6</td>
</tr>
<tr>
<td>54/55</td>
<td>5.0</td>
<td>4.44</td>
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<td>115.9</td>
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<td>5.25</td>
<td>4.95</td>
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<td>59/60</td>
<td>5.25</td>
<td>4.89</td>
<td>107.4</td>
</tr>
<tr>
<td>60/61</td>
<td>5.375</td>
<td>4.94</td>
<td>108.8</td>
</tr>
<tr>
<td>61/62</td>
<td>5.625</td>
<td>5.36</td>
<td>104.9</td>
</tr>
<tr>
<td>62/63</td>
<td>5.625</td>
<td>4.93</td>
<td>114.1</td>
</tr>
</tbody>
</table>

(a) for month of June preceding announcement of new season's guaranteed price.

(b) Source: Reserve Bank of Australia: Statistical Bulletins.

It will be seen from this Table that on only two occasions during the three stabilizations did the bond yield exceed the rate of return allowed in the wheat costs formulae. On average the bond yield exceeded the latter rate by 5.6%. Applying the average figure to the cost of "interest" in the 1962-63 assessment we find it represents a difference of 2d. to net costs per bushel.
Interest on Working Capital

In the previous Section, it was indicated that it was necessary to identify interest payments made in respect of working capital because this item presents special difficulties which required it to be separately computed.

For this computation it is necessary to:

1. Define what we mean by working capital
2. Assess the level of working capital requirements
3. Assess the working capital outlay period
4. Select an appropriate rate of interest to measure the cost of working capital

and

5. Decide on an appropriate method of assessing movements in the cost of working capital between survey periods.

(1), (2) and (3) have already been discussed under the Section dealing with the evaluation of the farm asset structure. (4) and (5) will be discussed later in this section after an examination of developments in the method of handling interest on working capital in official assessments has been made.

In the First stabilization scheme, the item was comprised in the two items, interest on borrowed capital and interest on bank advance (a cost incurred by the Wheat Board in borrowing funds to pay growers a first advance on their deliveries before their crop is sold). In effect the one item related to interest on outlays (1) made up to the time of delivery of the crop and the other to the continuing interest charge on the outlay up to the (average) date at which the crop was sold. As interest on borrowed capital

(1) which were not of a capital nature.
related only to farmers' records of actual charges incurred no account was taken of the cost of working capital provided by the farmer himself.

In the second and third stabilization schemes, the item, interest on borrowed capital, was as indicated above eliminated from cost calculations and introduced in another form into the item, interest on (or return to) capital. In this substitute calculation no allowance for interest on working capital was made presumably because the item, interest on bank advance, was taken to be an adequate allowance in this respect. If this were the case, then the presumption was unjustified as interest on bank advance bears reference to a time period subsequent to, not preceding, the first advance.

In 1955/56 interest on bank advance was omitted from the cost calculations as the Solicitor-General had given as his opinion that the item was not a valid cost under the terms of the Commonwealth and State Wheat Stabilisation Acts. The Wheat Cost Index Committee, however, recognised that interest on working capital was a legitimate production cost and accordingly incorporated an allowance in the cost formula for this item on the basis of 10/- per bushel for 12 months (estimated average outlay period), at 5% (the then current overdraft rate.)

However, as the item, interest on working capital, refers to the outlay period preceding the marketing year (commencing December 1st) and interest on bank advance refers to the period following the commencement of the marketing year, the items are quite obviously not substitutes for each other: in fact, in that they each measure separate parts of the one item, viz., interest on working capital, they are
complementary to each other. This does not imply that the two items combined are an accurate measure of interest on working capital; indeed while it is clear enough that either one as an overall measure is inadequate in itself, it is possible that the two measures combined are excessive (1) or would be if this net wheat cost item were associated with gross costs in an acceptable way.

In the third stabilization scheme, interest on working capital, was incorporated into the base gross cost structure on the basis of 10/- per bushel at 5½% for 6 months. This average outlay period of 6 months was chosen because calculations indicated that the average period between the incurring of the various expenses and receipt of the first advance was approximately 6 months.

Movements in the cost of this item were subsequently measured by the overall movement in "cash" costs.

The chief objections to the above procedures are:

(a) that the level of working capital requirements are based on an arbitrarily chosen figure of 10/- per bushel;

(b) that the cost was calculated on a net wheat cost basis viz. 10/- per bushel then incorporated into the gross cost structure in such a way that this original net cost was reduced by more than one half; and

(c) that the calculations fail to take the full outlay period into account.

As regards (a) we have indicated a preference for the assessment of the level of working capital balances required by a wheat producer by a separate calculation in

(1) This is suggested by the size of the items depreciation and return to capital.
respect of each item and for this purpose, cognisance should be taken of all items excepting depreciation and return on equity.

As regards (b) considerable care needs to be taken to ensure that gross and net costs are properly handled when they are brought together into a single calculation.

As regards (c), no allowance for interest on working capital is now made in respect of that part of the outlay period occurring after the first advance is made. (1)

Though it may seem to appear that interest on bank advance is not a valid cost of production in terms of the relevant Stabilization Acts, it does not follow that the item is not a valid cost of production in the economic sense. Economically speaking production costs may be identified with supply cost and may be defined as all costs associated with a commodity up to (a) the time; and (b) the geographic point of its sale. (b) is clear enough. As regards (a) consider, for example, the charges incurred by a retailer in holding stocks for sale: these are rightly regarded as costs, (the costs of producing a service) and in respect of any particular units of a commodity held in stock, the cost of stocking will only end when the particular units are sold. Likewise, the costs of supply (production) of wheat can only end when the commodity is sold.

When the Wheat Board acquires wheat from growers, it becomes the legal owner of the wheat. However, it does not, at the same time, assume responsibility for the cost including risk of holding stocks. These are debited to suppliers' accounts. Thus, in the economic sense, the producer's supply or production costs do not cease to be incurred at that point of time at which he delivers his wheat to the Board - rather

(1) A method of calculating this part of the outlay period was outlined in an earlier Section dealing with the evaluation of the level of working capital requirements.
they cease only when the wheat is sold. In view of this, it would appear that the item, interest on bank advances, is, in the economic sense, a cost of production.

The implications of such an interpretation depend on the intentions of the parties to the Wheat Stabilization Agreement. If, as it seems, the intention were to cover all costs of production, then producers might justly claim that interest on bank advances should be incorporated in the cost formula.

If the Minister for Primary Industry who is finally responsible for determining the cost of production of a season accepted this interpretation, it would seem that we should only require to ensure that it was not specifically invalid under the relevant Act for the Minister to authorize its incorporation in the cost formula.

Section (5) of the Commonwealth Wheat Industry Stabilization Act is directly relevant and provides as follows:

"(1). For the purposes of this Act, the cost of production of wheat of the season commencing on the first day of October, One thousand nine hundred and fifty-eight, is Fourteen shillings and sixpence per bushel.

(2). For the purposes of this Act, the Minister shall, before the first day of December in each season in relation to which this Act applies, other than the season referred to in the last preceding sub-section, after consultation with the appropriate Minister for each State, determine an amount to be the cost of production of wheat of the season, and shall, before that day or as soon as practicable after that day, notify in the Gazette the amount so determined."
(3). The Minister shall determine the cost of production on the basis of fair average quality bulk wheat free on rails at the ports of export.

(4). In determining the cost of production of wheat of a season, the Minister shall:

(a) take as a basis the sum fixed by sub-section (1) of this section as the cost of production of wheat of the season commencing on the first day of October, One thousand nine hundred and fifty-eight; and

(b) make such increase or decrease in that sum as he considers appropriate by reason of increases or decreases in cost. "

It will be seen from this section of the Act, that costs are not rigidly defined, that no cost is specifically invalidated and that the Minister has discretionery power as to their interpretation. Accordingly, the Minister would seem to be free to incorporate the item in the cost formula if he felt this justified.

However, if the view prevailed that interest on bank advances could not validly be allowed as a cost under the Act, provision could be made in any further relevant legislation for an all-embracing economic definition of cost of production.

Also it might be noted, in this context, that if interest on bank advances cannot be justified as a valid cost of production in terms of the relevant Acts, neither it seems can other Wheat Board charges, excepting rail freight from sidings to ports, be so justified.

We return now to discuss items (4) and (5) mentioned above in connection with the assessment of the cost of working capital.
In the official wheat cost formula, the cost of working capital is calculated on the basis of the Trading Bank overdraft rate. As Trading Banks are the main source of farm borrowings, this is an appropriate rate to use. It could be argued of course that since farmers use their own resources to an important extent to finance their activities this component of working capital should be costed at a rate which compares with the prospective earning rate of this finance if invested elsewhere. An appropriate rate would, for reasons given elsewhere, be the bond rate. However, such a rate would not be appropriate if it exceeded the overdraft rate, unless at the same time it could be unequivocally established that working capital could not be obtained from Trading Banks. Of course, if the bond rate were less than the overdraft rate, the farmer would unnecessarily increase his costs if he borrowed working capital from the Bank and invested his own funds in bonds.

The remaining matter to discuss is the method of measuring movements in the cost of working capital in the wheat cost index. Present practice is to adjust the base cost of working capital by the overall movement in cash costs. However, the cost of working capital, cet. par., varies with changes in the price of outlay items and changes in the rate of interest on borrowed funds. It appears then that present practice should be modified if changes in the cost of working capital are to be assessed as accurately as possible.
Owner-Operator's Allowance

Most farmers exercise the functions of labour, management, risk bearing and ownership. Therefore, as Bellerby(1) points out, their total revenue is compounded of wages or salaries, profit, interest and often rent and unless, as indicated earlier, each of these components of income represents a reasonable return in respect of its related productive factor, a cost-based price policy could not achieve its objective of reasonable returns and hence reasonable incomes for farmers. In other words, the allowance for a farmer's labour and management in a cost-based price should be determined independently of income accruing to him arising out of his equity in his farm.

The assessment of the owner operator's allowance will depend on the method of assessing wheat costs: if each farm cost item were dissected to obtain the proportion attributable to wheat production, it could be appropriate to assess the allowance in respect of wheat production only but if on the other hand the sideline deduction method were to be employed to allocate total farm costs as between wheat production and other farm enterprise, it would be necessary to assess the owner-operator's allowance in respect of the entire farm enterprise. Since the latter method accords with practice in the official assessment of wheat costs, we may usefully consider the question of the size of the owner operator's allowance on this basis. This does not of course imply endorsement of the sideline deduction method.

The typical farmer in Australia is the owner-operator who performs the functions of entrepreneur, manager and skilled labourer. According to Bellerby(2) the supply price of entrepreneurship - the readiness to work on own account and to assume the consequent risks - is negative because, he says, it is clear from common observation "that the typical risk bearer is not deterred from entering a field by the knowledge that there are less than even chances of gain, if the gain to those who triumph is appreciable; and the supply of such risk bearers exceeds

(1) op. cit. p. 16.  
(2) op. cit. p. 334.
the demand in most spheres".

Should an allowance be made in a cost-based price in respect of this function? This question must be answered in the negative because the significant risks in farming are eliminated under a cost-based pricing policy.

Our assessment of the owner-operator's allowance is now restricted to the functions of manager and skilled labourer. If we take the basic wage as the starting point for this assessment our task is to assess the value of the farmer's skills as a manager and as a farm worker.

Skill margins have been defined by the Commonwealth Arbitration and Conciliation Commission as "minimum amounts awarded above the basic wage to particular classifications of employees for the features attaching to their work which justifies payment above the basic wage, whether those features are the skills or experience required for the performance of that work, its particular laborious nature, or the disabilities attached to its performance." (1)

It is beyond the scope of this paper to attempt an assessment of the work value of an owner-operator for this is a subject which would require a special study in itself. What follows cannot therefore be regarded as more than fairly general indications of the standard of skill of farmers.

It is a well known fact that environment plays an enormous part in the education process. In farming, the effects of environment on education are unique in that, inter alia, children are exposed to and absorb farming practices from their infancy. The overall effect of this is so considerable that unlike other skilled occupations it is possible for the children of farmers, not having had any formal education in agriculture, to take over and efficiently conduct their father's or some other farm when they reach adulthood. This does not imply that formal agricultural education is unnecessary; in fact,

(1) Year Book of the Commonwealth of Australia, No. 46, 1960, p. 4461.
it is most desirable as an adjunct to practical education particularly because of its potentially valuable productivity effects.

The next thing to note is that in modern farming communities, agricultural extension services are widespread. These services by specially trained personnel pass on technical know-how to farmers and represent clear evidence of the greatly increased complexity of highly productive farming practices. This is not to say that all our farmers are adequately trained for their profession - clearly they are not; nevertheless, in the wheat industry where the advanced techniques of production are well known and very widely practised, a level of efficiency has been reached which compares favourably with the standard of efficiency of wheat producers in any other part of the world.

The 1957 survey of the wheat industry indicated that the average value of wheat growers' farms was over £28,000 (excluding house and private vehicles) and that gross income per farm averaged £6,700. The magnitude of these figures indicates a need for wheatgrowers to have financial skills as well as technical expertise.

Bellerby looked at farm labour skills from the point of view of their relationship to non-farm labour skills. He concluded on the basis of the results of two methods of measurement that, on average, farm and non-farm labour are about equal in skill requirement. Questionnaire results used by Bellerby in his examination of this question indicated that from a specified list of skills, agriculture ranks almost last with regard to (a) need for accuracy in measurement, design and control; (b) need to work from written instructions of plans and (c) responsibility for human life; and it is thought to be among the least subject to risk of disease and accident. It is near the middle of the list in (a) skill with tools and (b) team work, while being above the halfway line in respect of (a) length of training, (b) skill
with machinery, (c) judgement and self-reliance and (d) various forms of endurance. Agriculture leads the list in (a) responsibility for the care of materials or livestock, (b) responsibility for planning ahead and with shipbuilding, (c) need to do a wide variety of jobs.

With regard to the skill margin in respect of the managerial function of a farmer, Bellerby says that the scarce qualities which are essential to a manager, but not in a comparable degree to a farm wage earner, may be summarized as the capacity to conceive the enterprise as a whole, to combine its various branches, to picture its potential development, to budget, to buy and sell with judgement, and to organize the movement of material and the use of manpower. He added that a typical farm manager's margin is 20 to 30% of the average farm wage (a judgment based on European and North American experience) and that in his view the margin could scarcely be less than 20%\(^\text{(1)}\).

Let us see how these figures work out in Australia. In the absence of reliable data on average farm wages, I have calculated from the aware rate in New South Wales for a general farm hand. As at January, 1963, this comprised a basic wage of £15/1/- and a margin of £1/4/- for a total of £16/5/- weekly. Working from this figure a typical manager's salary would on Bellerby's figures, fall within the range of £19/10/- to £21/2/6 per week, (which compares with the current official allowance of £21/7/- weekly). One apparent weakness of this calculation is the margin for skill allowed in respect of a general farm hand. We are dealing with farmer's labour which requires much more skill, e.g. as indicated above, Bellerby's view is that farm and non-farm labour are about equal in skill requirement. If, as seems reasonable, we regard the skill required of a fitter as being equivalent to the average skills required in non-farm labour occupations, we get considerably higher figures for the owner-operator's allowance, viz. £24/8/- to £26/9/-\(^\text{(2)}\).

\(^\text{(1)}\) op. cit. p.334
\(^\text{(2)}\) i.e. based on a fitter's skill margin of £5/6/0 weekly.
Which of the two sets of figures is the more acceptable? In terms of work value, the latter set would appear to be. However, we have got to consider this in relation to the objective of policy viz., reasonable income. This we may define as the minimum level at which a farmer would willingly stay in the industry - for higher amounts new entrants would be attracted; for a range of lower amounts farmers would continue unwillingly in the industry (for reasons of occupational and social immobility, etc.) and at still lower amounts they would leave the industry.

How might an appropriate figure be assessed? There are few guidelines. The upper limit of the figure could be regarded as the level of the allowance determined on a work value basis (using non-farm values). The actual figure would be less than this amount by the value placed on farming as a way of life. It is not possible here to attempt an assessment of this value, but for the sake of illustrating its effect the purely hypothetical amount of £5 per week is taken. This would give, in relation to the second set of figures mentioned above, an actual wage in the range £19.8.0 to £21.9.0.

Of course, if the object of policy were to succour an ailing industry because of its importance as an earner of export receipts, one should enquire whether the value placed on farming as a way of life might be such as would lower the actual monetary income of the farmer below the minimum level considered essential on economic grounds for satisfactory export performance. If, on the other hand, the object of policy were industry stability and reasonable incomes, as in our wheat industry stabilization schemes, it would seem appropriate to take the value placed on farming as a way of life into account in the assessment of the owner-operator's allowance.

We shall turn now to consider how the allowance has been determined under the Wheat Stabilization Schemes. In the first Scheme, the Wheat Cost of Production Committee was able to side step the question of a fair remuneration to the farmer, it being outside its terms of reference, and settle for a more
or less undefined figure that reflected the going wage rate for farm labourers, incorporated an allowance for the function of management and took into account (subjectively) the real income advantages and disadvantages of farm dwellers. The Committee considered that the average farm wage was about £5 per week plus keep which was valued at 25/- per week; in all £6/5/- per week. By setting the owner-operator's allowance at £6/10/- per week the Committee was in effect allowing 5/- per week for the managerial function, a skill margin of only 4½%. This margin apparently was not affected by the net balance of advantages and disadvantages of farm dwellers subjectively determined by the Committee; in fact, one would expect that the net balance (if any) would for the greater part at least also apply to farm labourers and be reflected in their wages and thus that if the Committee had had some net balance figure in mind for farmers it should have been automatically taken up in the unskilled component of the assessed allowance. This being so, we may regard the 4½% skill margin as grossly inadequate.

In assessing the owner-operator's allowance, the Committee indicated inter alia that it had not overlooked that a farmer seldom pays rent on his house, that local government rates are defrayed by the business of the farm and that farmers benefit from self provision of commodities produced on the farm.

Assuming that the value of the farm residence was excluded from the value of farm land or structures (as is implied and as was the case in other surveys), the cost of accommodation under a cost-based pricing policy would fall on the personal earnings of the producer. We have seen that in this situation the personal earnings of the producer should be based on the earning rate for comparable labour and management in industry. Moreover, if farmers do not generally pay a rent on their farm house, this means that they must have committed financial resources for the full payment of the house and in consequence they now forgo the income these resources might
otherwise have earned. It follows that nobody would want to pay off a housing loan if reduced income were to be the consequence.

The farm residence component of local government rates and taxes which the Committee indicated were included in farm costs could hardly be expected to be of much significance because of the isolation of these residence from local government services.

As regards self-provision on farms, the "unearned" component of this may be taken to be equal to the at-farm value of the produce less the value of the farmer's labour.

On the one hand this recognises that farm costs are loaded with the costs of producing produce consumed on the farm and on the other hand that farmers work longer hours than the standard hours worked by urban workers whose earnings provide the bases for assessing an equitable allowance for owner-operators in respect of cost-based prices for farm products. These extra hours worked may justifiably be regarded in the same light as the backyard activities in fruit, vegetables, poultry and eggs of urban workers.

In the second Wheat Stabilization Scheme, the owner-operator's allowance was brought into line with the allowance used in assessing dairy costs. The basic wage component of this was adjusted each year in accordance with movements in the basic wage.

In respect of the first year of the third Stabilization Scheme, the Government accepted an industry figure of £1,040 as the owner-operator's allowance. This amount is the annual equivalent of £20 per week which corresponded to average weekly earnings per employed male unit in non-rural occupations in 1958 when the third scheme commenced. (1)

The allowance is adjusted by the precise amount of any changes in the basic wage.

This basis for assessing the owner-operator's allowance has behind it the principle of income parity as between the farm and non-farm groups and, in effect it means that the Government regards income parity, as being synonymous with its reasonable income criterion. It therefore appears that it is intended that income parity should be defined as equal pay in respect of occupations demanding equivalent levels of skill. However, so defined, income parity does not imply identity between average weekly earnings in manufacturing industry and average work value of wheat growers for clearly average weekly earnings may reflect higher or lower average levels of skill than wheat growers possess. Average weekly earnings also reflect overtime payments and thus overstate basic earning rates in industry. On the other hand to the extent that they do not contain an adequate managerial component, average weekly earnings understate income parity for farmers. Average weekly earnings are therefore a balance of various considerations not all relevant to the issue in hand.

If we interpret the criterion of reasonable income as work value less the value placed on farming as a way of life it appears that the government is achieving its income objective for wheatgrowers although it might well be said that the yardstick (average weekly earnings in industry) used to reach this objective only happens to provide an appropriate indication by accident.
Farm Labour

The 1957/58 Wheat Industry Survey revealed the overwhelming importance of the owner-operator on the one hand, and family members on the other, as sources of farm labour. 42% of survey farms were conducted by the owner-operator employing for the greater part only casual labour. A further 50% of farms were conducted solely by family labour arrangements (partnership, sharefarmer or simply family labour).(1)

The labour of the owner-operator has been separately considered. The only problem connected with hired labour is to separate wage payments in respect of development work from wage payments directly connected with productive activity.

Family labour and sharefarmers' activities provide additional problems. The direct remuneration of family labour bears little relation to its real value because apart from income in kind (e.g. board and lodging) the reward to this class of labour is, in an important degree, on the basis of profit sharing or future capital deed.(2) The special problem with sharefarmers is the difficulty of identifying their costs.

To ensure that labour costs were accurately assessed, data were collected in four categories, viz., routine farm work, harvest work, development work and off-farm work. In respect of family labour, data were also collected on each type of labour unit (adults being classified by sex and juniors by sex and age) and the time actually worked by each of these units. These labour inputs were then costed at award rates. The same procedure was followed in respect of sharefarmers' labour. Other costs borne by the sharefarmer were of course included in farm production costs.

(2) ibid p.8
As regards the measurement of movements in labour costs over the course of a Stabilization Scheme, the current practice is to vary the survey data by the percentage changes in State Awards where they apply (in N.S.W., Victoria, and W.A.) or otherwise changes in State Basic Wages (in S.A. and Q’ld.) The base cost determined for harvest labour is adjusted from year to year by movements in Harvest Awards where they exist. This practice introduces a formal anomaly into the costing procedures since the base cost of harvest labour includes permanent hired labour and family labour which were costed at award rates for permanent employees.

Harvest labour should be split up to show separately casual labour hired for harvesting work and permanent labour engaged in harvesting work. Assessed movements in the costs of these items should then be based on the movements in their respective award rates. However, for all practical purposes, the present procedure can be accepted as providing sufficiently accurate results.

It might also be noted that harvesting costs are understated because of the omission of the cost of the owner-operator's harvesting work: this of course does not affect aggregate costs because of its inclusion in the owner-operator's allowance.

It may therefore be concluded that farm labour production costs are accurately assessed in the costing procedures.
Depreciation

There are four main classes of farm assets which should be considered in relation to depreciation. These are (i) land and improvements; (ii) structures; (iii) plant and (iv) livestock.

In wheat cost assessments, it is assumed that categories (i) and (iv) are non-depreciable assets. In the sense of their physical capacity to produce a given output, this is reasonable since there is no user cost arising out of the productive use of these assets if they are properly managed and it would be an irresponsible policy that would allow losses due to mismanagement as costs of production.

As regards land, proper crop rotations combined with appropriate applications of fertilizers arising out of basic deficiencies in the soil, will prevent physical deterioration of the soil.

As regards livestock, the position is quite different but the result is the same. Consider for example a flock of sheep. The object of flock management is, inter alia, to maintain an equilibrium flock structure, i.e. defined numbers of each type in each age group. Insofar as this is achieved, there is no change in the flock structure and, cet. par., the value of this asset in the sense of its physical capacity remains unchanged over time. In effect, the average unit value of sheep in the flock, cet. par., remains unchanged. This is akin to the trees in the forest analogy with which Alfred Marshall explained his theory of the growth and decay of firms and the existence of a representative firm.

In arriving at these conclusions that there is no user cost in the proper productive use of land and livestock, it should be made clear that this does not mean that these assets cannot change in value for other reasons. Indeed
they can and do. The value of land is affected by the prices being received for the commodities it is capable of producing whilst the value of sheep is affected by changes in the prices of the products derived from sheep. For example, if land and livestock values decline because of a decline in prices of the commodities produced by these assets, this must be recognized as a decline in (derived) demand for these assets and not as a user cost.

These matters have been discussed elsewhere and are mentioned here merely to sharpen the distinction between changes in value as a result of demand forces and changes (declines) in value as a result of wear and tear through productive use.

We turn now to discuss the assessment of depreciation of structures and plant. As indicated earlier structures are now valued on the basis of replacement cost less depreciation. Depreciation was calculated by the straight line method which means that the annual depreciation charge on an asset was constant throughout its life. The rates of depreciation used were the standard rates\(^{(1)}\) applied by the Taxation Department prior to the introduction early in the 1950's of the special 20% tax rates.

Perhaps the main problem in the costing of depreciation has been the measurement of change over the course of a stabilization scheme. Present practice is to measure change by depreciation indexes. These indexes (one for plant and one for structures) are based on the assumption that equal quantities of these assets are worn out and replaced each year. This being so, price variation is the only way through which the value of depreciation can change. It follows from this that an index of value of depreciation can be derived from an appropriate price index series. The

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\(^{(1)}\) As set out in Income Tax Order 1217 of 1950.
index of value of depreciation of an asset is simply given by the summation of its related price index for the number of years it takes to fully depreciate. It is assumed that on average, items of plant take 10 years to wear out while all structures taken together have an average life of 40 years.

In effect the method assesses movements in the cost of depreciation in terms of the original cost of the assets involved. This would mean that in periods of inflation depreciation in real terms would be understated, and vice versa. This deficiency could be simply overcome by using the price indexes to indicate movements in the current replacement cost of assets on the basis that the replacement cost of an asset purchased X years ago is the same as the replacement cost of a similar asset purchased Y years ago. The change in the cost of depreciation in real terms (which for our purposes means current values) is then given by the ratio of the index in the year "n" to the index in year "n-1" where year "n" is the current year.

This procedure is desirable in respect of both plant and structures, it being irrelevant to the proper measure of the cost of depreciation that plant is valued for other purposes on the basis of original cost.

We may next enquire whether the assumption that equal quantities of plant and structures are worn out and replaced each year is valid when we know that the tendency is for increased investment per farm in real terms in these assets.

An increase in net farm investment would be expected to have its productive response which, cet. par., would leave unchanged or lower unit costs, otherwise the investment would not be undertaken. For this reason it would not be realistic to reflect new investment in costs without also taking into account
the consequential effect on output. It follows that as no adjustment is made in respect of the latter between one survey and the next no adjustment should be made with respect to new investment between surveys.

It would appear then that the assumption does provide as reasonable a basis as possible for assessing movements in costs of depreciation; that is to say, it is an acceptable and essential part of the price index structure which is required to up-date survey data to the current season.
Seed Wheat

In the base cost structure of the third stabilization scheme, the cost of seed wheat was calculated by estimating the quantity used on the basis of the common sowing rate of one bushel per acre. The usage figures so derived were then costed at the previous season's net cost at sidings figure plus an adjustment of 2% to cover freight charges and wheat purchased at premium prices.

This, in principle, is a good procedure as recorded data is unreliable due to the fact that many farmers do not have adequate records of seed wheat usage. However, one is justified in objecting to the costing of seed wheat on the basis of the net cost at sidings figure. This figure is about 7d. above the net "at farm" cost which would be, theoretically, a more acceptable figure. If this figure were used, it would then be valid to make an upwards adjustment in respect of seed wheat purchased off the farm. As the procedure stands now, however, the upward adjustment for freight is not valid although that part of the 2% relating to the added cost of premium seed wheat is.

For the purpose of costing seed wheat in the base cost, the net cost at-sidings figures used were adjusted for yield; whereas they were originally determined on the basis of a 13.5 bushel yield figure they were recalculated on the basis of a 15.0 bushel yield figure (which corresponded more closely with actual trends) in the base cost calculation of seed wheat. This is an objectionable practice in theory since the original net costs at-sidings figures became in effect the guaranteed price at sidings for wheat. The at-farm equivalent of this price was, therefore, the real cost of seed wheat to the farmer - indeed in cases where he sold his own wheat and purchased his seed wheat this is the price he actually paid.

In each year of the stabilization scheme, the cost of seed wheat is adjusted according to the percentage change in net cost of production at-sidings for the previous crop year. This is a logical procedure since "this" year's seed wheat was produced at "last" year's prices.
Other Costs

The remaining cost items are those incurred costs that appear familiarly in farmers' tax records, viz., fertilizer, maintenance, fuel, rates and taxes, insurance, cartage, cornsacks, etc.

The practice is to sift through these items to eliminate any elements of developmental or personal expenditure occurring therein. For example, it is frequently found that large amounts of material included under maintenance items are really replacement capital expenditures. Such expenditures are eliminated from costs. The cost of seed and fertilizer used to lay down a new pasture is also treated as a capital expenditure and eliminated. Though the practice has no significance in terms of wheat costs, it is worth pointing out that on theoretical grounds this procedure might not always be sound. For example if regular and roughly equal applications of fertilizer were to be made to pastures each year, the expenditure involved would then be a valid cost of production.

When incurred costs have been adjusted to exclude developmental expenditure the only remaining problem in dealing with these items is to devise suitable price indexes for estimating movements in their costs over the course of a stabilization scheme.

As each cost group (elsewhere called item), with the exception of "miscellaneous" which represents a heterogeneous group of small items, covers a somewhat homogeneous collection of items, there is a marked tendency for the prices of the items within each group to move in step with each other. The significance of this is that difficulties associated with the precise weighting of these items do not lead to any serious compromise with accuracy in measuring the overall price movements of each group.
The existing bases for estimating these movements are discussed below.

**Fertilizer**

On wheat farms, fertilizer consists almost entirely of superphosphate. For this reason, movements in the price of superphosphate (at sidings basis) have been used to measure movements in the cost of this item. Superphosphate prices are collected on an F.O.R. "at works" basis and are converted to an "at sidings" basis by an addition for rail freight which is based on modal rail distances to wheat regions and rail freight rates for fertilizer. This procedure despite its shortcuts seems justified on the basis that further refinement in the calculations would be most unlikely to significantly change the results.

As the price of superphosphate varies between States and as some States are relatively more important than others as users of superphosphate, it is necessary to weight the State prices to get an acceptable average price. For this purpose, the current season's (estimated) wheat acreages are used as weights\(^1\). The resulting price index is of the form \(\frac{W_1 P_1}{W_1 P_0}\) where \(W_1\) represents current wheat acreages, \(P_1\) the current season's price of superphosphate and \(P_0\) the previous season's price.

The use of current weights in this index calculation could only be regarded as providing a better measure of changes in cost than a base-weighted index if there were good reasons for taking the current year to be the normal year or the only relevant year in terms of cost-based prices: these reasons are not however apparent.

\(^1\) It is not possible to use these data as weights to re-assess the level of the base cost of the item itself because we should then also require to know the relevant production figures and other changes resulting from a change in farm type.
Maintenance of Machinery

Movements in the cost of maintenance of machinery are based on movements in the prices of 89 parts which are most frequently replaced in machines used on wheat farms. These price movements are combined into an overall figure by taking the simple average of the individual price relatives. This is a long way short of a precise calculation: the coverage is small and the use of a simple average is suspect. However as time and cost limit the collection and processing of data this procedure is probably justified on the ground of expediency combined with an adequate order of accuracy.

Maintenance of Structures

A weighted regimen consisting of basic building and fencing materials most used by farmers has been used to assess movements in the cost of this item. Though the weights which are based on a small sample of growers are probably suspect, the index most probably yields a sufficiently reliable figure in terms of the relative importance of the item, as there is some tendency for sympathetic movement in the prices of items in the regimen.

Fuel and Oil

To measure the movement in the cost of this item price data in respect of certain fuels and lubricants in six representative wheat belt towns in each of the four main producing States are collected and combined into an aggregative index by a system of weights.

The weights were built up as follows: the relative weightings of kerosene and distillate were derived from a sample of farmers selected at random from the Wheat Cost of Production Committee's survey schedules. The other weights were estimated on the basis of the relationship of lubricant usage to fuel consumption for a 25 h.p. tractor under average conditions.
The weight for petrol was based on an estimate of its importance in relation to the other fuels. This weight (for petrol) was reviewed and increased in the 1949/50 wheat cost assessment. The weights calculated have applied unchanged since that year.

An obvious criticism of the weighting system is that it was not reviewed in the light of the results of subsequent surveys, notwithstanding that farm mechanization is known to have continued at a fast rate in the period since the weights were first calculated.

In addition the practice of collecting price data from six wheat belt towns in each State without regard to their relative importance would seem to warrant reconsideration in view of the policies of the oil industry of pricing its products on a strictly defined regional basis.

Rates and Taxes

Movements in the cost of rates and taxes, the main component of which is shire rates, are measured in the following way: data are collected from shire clerks on rateable values and average rates payable in wheat growing areas. From these data State totals of rates assessed are calculated and the relative given by the current year's to the previous year's total rates is determined. The relatives for each State are then combined, by weighting them by the estimated areas sown to wheat in the current year in an index of the form $\frac{P_1 W}{P_0 W}$; this gives a Commonwealth relative which is taken as the measure of the overall movement in the cost of rates and taxes.

Insurance

The main types of farm insurance are crop, fire, workers' compensation, and motor vehicle (comprehensive and third party) insurance. Outside of structural changes on farms and apart from decisions to increase or decrease insurance coverage, the cost of insurance varies according to changes in insurable values and/or insurance rates.
Data on changes in insurance rates are obtained from underwriters. These rates are converted into price relatives and weighted by current wheat acreages to yield an average rate for the main wheat producing states.

Changes in insurable values were obtained in the following way: the changes in the maximum insurable value allowed by the insurance companies per bushel of wheat is used to measure the changes in crop values. The change in the value of plant is given by the Index of Capital Values of Plant and the change in the value of structures is given by the Index of Capital Values of Structures.\(^1\) As workers' compensation premiums are affected by changes in wage rates, the average of the price relatives for harvest labour and "other" labour is used to measure the effect of wage rate changes on these premiums.

The change in the cost of insurance is calculated by applying (in turn) to each of the insurance items the weighted relatives of the (five States) average of insurance rates and the relatives of the capital value of insured items. These calculations have an obvious air of thoroughness about them: they cover the main categories of farm insurance and allow for the effects of changes in both insurable values and insurance rates.

\(^1\) Source: Bureau of Agricultural Economics, Canberra.
The mechanics of the tabulation in respect of the year 1962/63 are shown in the following table:

**INSURANCE**

<table>
<thead>
<tr>
<th>Type of Insurance</th>
<th>Sub-Index 1961-62</th>
<th>Weighted Relative for Ins. Rates (5 States)</th>
<th>Relative for Ins. Values</th>
<th>Sub-Index 1962-63</th>
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</thead>
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<tr>
<td>Crop</td>
<td>40.7</td>
<td>108.5</td>
<td>102.6</td>
<td>45.3</td>
</tr>
<tr>
<td>Motor Vehicle -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>109.2</td>
<td>100.0</td>
<td>12.4</td>
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<tr>
<td>(b) Comprehensive</td>
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<td>102.7</td>
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<td>104.1</td>
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<td>102.9</td>
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</table>

**Cornsacks**

Cornsack prices are different in each State. Accordingly, it is necessary to calculate an overall price each season. This is calculated using the formula \( \frac{W_1 \cdot P_1}{W_1 \cdot P_0} \) where \( W_1 \) represents estimated production in the current year, \( P_1 \) the price of sacks in the current year and \( P_0 \) the price in the previous year.

The production weights used in this calculation need not necessarily reflect the relative usage of cornsacks by States because a very considerable proportion of the crop is now delivered in bulk - they also fail to take account of recent trends in this regard. However possible errors on these accounts are probably minimal because the prices in the various states are closely related and tend to move together.
Cartage

As identified in the official gross cost structure of the industry, this item refers only to wheat cartage. More specifically it refers to wheat cartage costs on those survey farms whose records enabled it to be separately identified. As only relatively few wheat producers who get their wheat carted have separate cartage cost figures available, this cost item is considerably understated, i.e. for the greater part the cost of this item is included in other items. And as an indication of the average cartage cost of wheat per bushel the item is even more inaccurate because a high proportion of growers cart wheat in their own vehicles. (1)

Measuring the movement in the cost of the item as it stands is achieved thus: data on cartage rates are obtained from State Road Hauliers' Associations and combined, using estimates of current production as weights, into an overall Commonwealth figure. It could be argued here that the weights do not reflect possible changes in the utilization of commercial carriers. However the item is so small that the effects of any such changes would be insignificant.

Rent on Crown Land Held on Perpetual Lease

Land held on perpetual lease from the Crown was not taken into consideration in the valuation of farm assets for the purpose of assessing return to capital (discussed earlier). This land was costed on the basis of rentals actually paid. The procedure is supported although for presentational purposes it might have been tabulated under the item, return to farm capital.

(1) An unpublished study of cartage costs by A.E. Cox, Bureau of Agricultural Economics, based on the 1957 wheat survey results indicates, inter alia, that in N.S.W. 50% of wheat producers deliver in their own vehicles; of the remainder, many did not have separate wheat cartage records. Also, as indicated elsewhere, Cox assessed the true cost of cartage at about 7d. per bushel; this compares with a figure of approximately 1d. per bushel in the official cost figures.
Movements in the cost of this item were for some years based on the proportion of leases being re-assessed each year and the change in rentals arising out of this re-assessment.

In the third stabilisation scheme this item was held unchanged in respect of each year's assessment. This procedure is apparently dictated by the minor nature of changes in the item and its relative insignificance. Ideally of course adjustments ought to be made.

**Miscellaneous**

This item covers a miscellany of individually small cost items, e.g. postage, telephone charges, bank charges, subscriptions to organisations, accountants' fees, woolpack and shearing costs, taken from the farmer's tax returns. Movements in the cost of this item are based on the overall movement in the other items in the gross cost structure excluding interest on working capital. This exclusion has no justification on theoretical grounds nor does it appear to have any practical significance.

As miscellaneous costs aggregate about 8% of total gross costs, it is always worth while reviewing the basis of measuring cost movements in the item. It might be possible for example to separate out further items, movements in the cost of which could be measured by a closely related price index. Some possible items for consideration for this sort of treatment are woolpacks, shearing costs and pesticides.

It is difficult to assess the appropriateness of using the movement in the main items of the gross cost index as a measure of cost movements of the miscellaneous items; it might be said however, that it does seem somewhat unusual
that movements in this index, which has no components common to the miscellaneous group, should be regarded as the best indicator available.

This brings us to the end of our discussion on the individual cost items contained within the Wheat Cost of Production Index. There is, however, another composite item, which is directly related to the guaranteed price – namely, rail freight from sidings to ports and Wheat Board handling charges. This item is discussed below.

**Rail Freight and Wheat Board Handling Charges**

Wheat cost of production figures based on survey data are calculated on an "at sidings" basis, i.e. no costs wholly external to the farm are accounted for in the cost formula. However, under the Wheat Stabilization Act, prices are guaranteed on an "f.o.r. ports" basis. It is therefore necessary for the cost assessment to be on the same basis.

Present practice in this regard is to add to the assessed "at sidings" cost figure, the Wheat Board's estimates of rail freight (from sidings to ports) and handling charges (excluding interest on bank advances). Handling charges include storage, administration and special road transport or generally every cost incurred by the Wheat Board in receiving, storing and selling wheat of a season.

In effect, the f.o.r. ports figure is determined by adding to the computed at-sidings cost (based on average or expected yields as weights) the actual rail freight per bushel (i.e. based on actual yields as weights).

This procedure raises the question whether it is theoretically possible to get a meaningful result by adding together two figures which were calculated on the basis of different sets of weights.
If there were an increase in the proportion of production coming from regions with higher than average freight costs per bushel, present calculations would indicate a rise in costs; actual costs, however, might rise or fall — they would rise if the national average yield declined and fall if the national average yield increased (i.e. over and above the very small increase required to offset the rise in average freight costs per bushel). These results arise because in general farmers' outlays (except for harvesting, cartage, and rail freight) tend to be the same for all yields so that when yields are below normal, unit costs are above normal and vice versa.

The same "mixed" results obtain if we consider an increase or decrease in the proportion of production coming from regions with lower than average freight costs per bushel; or a decrease in the proportion of production coming from regions with higher than average freight costs per bushel.

In other words there is only a 50% probability that the present procedure would give a better approximation to the true position than would be given if average or expected yields were used in the calculation of the cost of rail freight. (1)

(1) This is the main charge paid by the Wheat Board on behalf of growers; other Board charges, cet. par., tend to rise or fall on a per bushel basis according as the volume of deliveries is lower or higher than normal.
Conceptually, therefore, there does not seem to be any advantage in the present method of using actual yields in respect of rail freight costs, the more so perhaps as they are only estimates. On the other hand, the use of estimates of actual costs in respect of other Wheat Board charges which tend to vary directly, on a unit basis, with the volume of deliveries, would seem to be entirely justified.

As regards rail freight it might be concluded that if our policy objective were to ensure that income over a period of years averaged out at a reasonable level, we could properly base our calculation of the rail freight charge (together with the at-sidings cost index figures) on expected yields.
A Form of Summary

No attempt has been made to quantify the effects of the various suggestions made for improving the cost assessments because although we have found that the calculation of sideline cost in the cost formula is unacceptable, it has not been possible to make any substitute calculations.

However, to provide a form of summary of our findings the various other items have been categorised hereunder in respect of the first three stabilization schemes according as they are considered to have been under-priced or over-priced in the respective cost formulae.

First Stabilization Scheme:-

Items underpriced:

Interest on capital in respect of valuation of land, plant, structures, livestock and working capital.

Owner-operator's allowance.

Depreciation.

Seed.

Family labour.

(Cost of self provision on farms - as an offset to wheat costs - not taken into account).

Items overpriced:

Interest on capital - interest rate slightly high.

Second Stabilization Scheme:-

Items underpriced:

Interest on capital in respect of valuation of land, plant, structures and livestock.
Interest on working capital - no allowance made.

Depreciation.

**Seed.**

(Cost of self provision on farms - as an offset to wheat costs - not taken into account).

Items overpriced:

Interest on capital - interest rate too high.

Third Stabilization Scheme:-

Items underpriced:

Interest on capital in respect of valuation of plant and structures.

Interest on working capital.

Depreciation.

(Cost of self provision on farms - an offset to wheat costs - not taken into account).

Items overpriced:

Seed.

Interest on capital - interest rate too high.

In addition to the foregoing the use of unrealistically low yield divisors to obtain unit costs in respect of each scheme introduced an element of over-pricing in cost items in general.
# APPENDIX I

## Table 1: First Wheat Industry Stabilisation Scheme

### Gross Cost Structure and Net Wheat Cost

<table>
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<tr>
<th>Item</th>
<th>1947-48 d. per bush.</th>
<th>1948-49 d. per bush.</th>
<th>1949-50 d. per bush.</th>
<th>1950-51 d. per bush.</th>
<th>1951-52 d. per bush.</th>
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Table 2: SECOND WHEAT INDUSTRY STABILISATION SCHEME
GROSS COST STRUCTURE AND NET WHEAT COST

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<td>26.62</td>
<td>27.33</td>
<td>26.64</td>
</tr>
<tr>
<td>Total net costs, bulk basis, f.o.r. ports</td>
<td>174.00</td>
<td>177.63</td>
<td>182.18</td>
<td>188.96</td>
<td>190.21</td>
</tr>
</tbody>
</table>
Basic Farm Characteristics

Following an examination of the data from the 1957 wheat survey, it was decided to assess wheat costs for stabilization purposes on the basis of data from wheat farms with 30% or more income from wheat. The basic characteristics of this class in the survey sample were as follows:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of farms</td>
<td>214</td>
</tr>
<tr>
<td>Total area sown to wheat in survey years (1954-55, 1955-56, 1956-57)</td>
<td>227,001 acres</td>
</tr>
<tr>
<td>Total production in survey years</td>
<td>4,212,262 bushels</td>
</tr>
<tr>
<td>Average yield per acre in survey years</td>
<td>18.556 bushels</td>
</tr>
<tr>
<td>Average area sown to wheat per farm</td>
<td>353.58 acres</td>
</tr>
<tr>
<td>Average production per farm</td>
<td>6,561 bushels</td>
</tr>
<tr>
<td>Average farm size</td>
<td>2,081 acres</td>
</tr>
<tr>
<td>Average wheat income</td>
<td>£3,341</td>
</tr>
<tr>
<td>Average sideline income</td>
<td>£3,503</td>
</tr>
<tr>
<td>Average total income</td>
<td>£6,844</td>
</tr>
<tr>
<td>Average % wheat income</td>
<td>48.8%</td>
</tr>
<tr>
<td>Average sheep numbers</td>
<td>818</td>
</tr>
</tbody>
</table>

The main cost components of survey wheat farms with 30% or more income from wheat are given below.
GROSS COST COMPONENTS 1954-55 TO 1956-57

<table>
<thead>
<tr>
<th>Item</th>
<th>Total (£)</th>
<th>Per Bushel (d.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials</td>
<td>1,237,065</td>
<td>70.48</td>
</tr>
<tr>
<td>Less Seed Wheat (actual cost)</td>
<td>13,090</td>
<td>0.75</td>
</tr>
<tr>
<td>Add Seed Wheat (imputed cost)</td>
<td>109,804</td>
<td>6.26</td>
</tr>
<tr>
<td>Total</td>
<td>1,333,779</td>
<td>75.99</td>
</tr>
<tr>
<td>Services</td>
<td>180,931</td>
<td>10.31</td>
</tr>
<tr>
<td>Wheat Cartage</td>
<td>16,724</td>
<td>0.95</td>
</tr>
<tr>
<td>Depreciation</td>
<td>545,770</td>
<td>31.10</td>
</tr>
<tr>
<td>Labour cost</td>
<td>1,009,689</td>
<td>57.53</td>
</tr>
<tr>
<td>Return (Interest) on Farm Capital</td>
<td>876,555</td>
<td>49.94</td>
</tr>
<tr>
<td>Total Gross Cost</td>
<td>3,963,448</td>
<td>225.82</td>
</tr>
</tbody>
</table>

Determination of Net Wheat Cost (1) by Sideline Deduction Method

Sideline income £3503 = $\frac{110}{100}$ of Sideline Cost by assumption (2)

Therefore Sideline cost = $\frac{10}{11}$ of £3503 = £3184.5

\[
\frac{£3184.5}{\frac{6561}{6561}} = £0.485368 = 116.48d. \quad (3)
\]

(1) This net wheat cost is known as the Base Cost which is specified in the Wheat Stabilization Act for the purposes of the third Stabilisation Scheme which commenced in 1958/59.

(2) i.e. implying a 10% profit on sales.

(3) official figure; actually 116.49d.
FARM COSTS IN SURVEY PERIOD INDEXED FORWARD TO 1957-58
(based on Survey Yield of 18.6 bushels per acre)

<table>
<thead>
<tr>
<th></th>
<th>1954/55 to 1956/57 average d/bush.</th>
<th>Price Relative %</th>
<th>1957/58 d/bush</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Farm Costs</td>
<td>225.82</td>
<td>109.5 (a)</td>
<td>247.27</td>
</tr>
<tr>
<td>Sideline Costs</td>
<td>116.48</td>
<td>109.5</td>
<td>127.54</td>
</tr>
<tr>
<td>Net Costs</td>
<td>109.34</td>
<td></td>
<td>119.73</td>
</tr>
</tbody>
</table>

(a) Gross costs increased by 9.5% over the period and on the assumption that there was no (significant) structural change, sideline costs were increased in the same proportion.

These assessed costs were then converted to a 15.5 bushel yield basis as this was the official yield figure decided upon for the third stabilization scheme. Thus:

1957/58 Assessed Costs on Yield Basis of 15.5 Bushels/Acre

<table>
<thead>
<tr>
<th></th>
<th>1957/58 (18.6 bush basis) d/bush.</th>
<th>Conversion factor %</th>
<th>1957/58 (15.5 bush basis) d/bush</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items constant for yield</td>
<td>9.77</td>
<td>100.0 (a)</td>
<td>9.77</td>
</tr>
<tr>
<td>Other gross costs</td>
<td>237.50</td>
<td>120.0 (a)</td>
<td>285.00</td>
</tr>
<tr>
<td>Sideline Costs</td>
<td>127.54</td>
<td>120.0 (a)</td>
<td>153.05</td>
</tr>
<tr>
<td>Rail Freight and Handling Charges</td>
<td></td>
<td></td>
<td>31.05</td>
</tr>
<tr>
<td>Net Costs f.o.r. ports</td>
<td></td>
<td></td>
<td>172.77</td>
</tr>
</tbody>
</table>

(a) \( \frac{18.6}{15.5} \times 100 = 120 \)

The 1958/59 base cost (14/6d.) was obtained directly from the 1957/58 figures (as above determined) by the method of indexing the 1957/58 gross cost structure forward and applying the resulting overall movement to the net cost at sidings figure of 141.72d. and adding on estimated rail freight and handling charges.
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