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TRENDS IN AGRICULTURE'S TERMS OF EXCHANGE

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The terms of trade is currently a very fashionable concept both amongst professional economists and in public discussions. Its excessive popularity and uncritical use has had rather unfortunate consequences on analysis and on policy. Not only do support measures for agriculture frequently aim at preserving historical price relationships but movements in the terms of trade are widely accepted as clearly indicating desirable shifts in the pattern of economic development. In the United Kingdom, for example, the thesis has been advanced that further exports of manufactures will depress prices of manufactured goods and that it is therefore in the U.K.'s interest to expand her agricultural output.

The frequency with which economists were guilty of proceeding from such partial equilibrium analysis to general policy conclusions led Smithies to protest that nowadays the terms of trade seem to be regarded as an unambiguous measure of the gains from trade.¹ There has unfortunately been no diminution of the obsession and it would now seem that D. Gale Johnson spoke rather too soon when he pronounced the lessening emphasis on relative prices as one of the major advances in agricultural economics.²

Why then believing so strongly that the terms of trade are such a dangerous starting point for a discussion of agricultural policy did I accept my present assignment? My excuse can only be the universal concern for the terms of trade and the fact that they are the rallying point of agricultural support policies both here and overseas.

It is, of course, natural enough for farmers' attention to be focused upon their terms of exchange, for price uncertainty is one of the major factors with which they have to contend. Similarly it is perhaps natural for countries with recurring balance of payments anxieties to look to their terms of trade. However, too close a pre-occupation with the terms of trade is as Kindleberger observes often symptomatic of a form of hypochondria in which the real trouble is inflexibility in resource-use.³

Let us examine briefly, then, recent movements in agriculture's terms

¹ A. Smithies, "Modern International Trade Theory and International Policy", *American Economic Review*, May 1952, p. 170.

² D. Gale Johnson, "Economics of Agriculture", Ch. 6, *A Survey of Contemporary Economics*, Vol. II, p. 233.

³ Charles P. Kindleberger, *The Terms of Trade. A European Case Study*. M.I.T. 1956.

of trade, the underlying reasons for these movements and their implications for policy, while bearing in mind their incompleteness as indicators of the state of trade or of agricultural prosperity, the difficulties of their measurement, the even greater difficulties of their prediction and the dangers of treating them as independent variables and as a springboard for general policy conclusions.

The accompanying table sets out movements in the terms of exchange for agricultural producers in the United States, the United Kingdom and Australia. The concept of terms of exchange used (net barter terms of exchange) will be familiar. It is well known parity ratio relating movements in prices received from a base period to movements in prices paid by farmers. It is a measure of changes in the purchasing power of a unit of farm output. This need not, of course, coincide or even move in the same direction as the international terms of trade for agriculture.

In Australia despite recent adverse movements farmers' overall terms of exchange are still considerably more favourable than in the immediate pre-war period. This is due principally to better price relationships for wool, the terms of exchange for products other than wool having dropped steadily since 1950-51 to a ratio of 107 per cent. in September 1957.

In the United States the parity ratio, on a pre-war base, has fallen to about 94 per cent. during 1956 and 1957. The trend in the United Kingdom, indicated only roughly by the ratio of agricultural prices to general wholesale prices, has been fairly stable during the last six or seven years. Judging from U.S. and Australian experience, the use of general wholesale price movements instead of an index of prices paid by farmers would tend to depress the figures obtained for the terms of exchange. Moreover, direct subsidies and production grants have increased in importance in the United Kingdom during the period covered. Little or no significance should, therefore, be attached to the fact that the relationship shown for the United Kingdom for 1955 was slightly below the 1938 level. Allowing for probable specification errors in the indicator used and for the effect of subsidised inputs not reflected in the calculations, it is probable that United Kingdom farmers are enjoying more favourable terms of exchange than before the war. Moreover, the system of forward assurances enacted in 1956 gives them a guarantee that these price relationships will not be seriously disturbed during the next four years or so.

It is interesting to note that in all three countries prices paid by farmers are continuing to increase at about 3 to 5 per cent. per year.

The fall in farmers' terms of exchange to levels approximating pre-war relationships does not, of course, mean that farmers now are no better off than pre-war. This is the sort of partial analysis we have to guard against. For farm output has increased greatly in all three countries.

I have not attempted to compile a similar comparison of movements in agriculture's terms of exchange over the long-term. The United States parity index goes back to a 1910-14 base and shows that in 1957 the terms of exchange for American farmers were some 18 per cent. less

favourable than in the so-called Golden Age of Agriculture—the pre-World War I period.

Several people have undertaken analyses of long price movements to determine whether there is a tendency for the terms of exchange to move against agriculture. E. M. Ojala,⁴ for example, examined “the proposition that under conditions of economic progress it might be expected, purely from demand considerations that the purchasing power of agricultural products will fall gradually”. This expectation rests largely on Engel’s law to the effect that as incomes rise a declining proportion of income is spent on food and other basic necessities. Under conditions of progressively rising levels of living, the argument runs, agricultural prices will tend to decline relatively as a result of the low income elasticity of demand for foodstuffs. Ojala finds that this proposition is not supported by the evidence, which suggested rather a secular upward trend in agriculture’s terms of exchange in the countries studied (U.S.A., United Kingdom and Sweden) between the 1870’s and 1930’s. The explanation offered by Ojala is in terms of a slower rate of productivity increase in agriculture than in industry.

Kindleberger also examined the long term trend and found that “it may be fair to conclude that there is no long run tendency for the terms of trade to move against primary products in favour of manufacturers”.⁵ Both Ojala and Kindleberger use unit value indexes which reflect changes in quality as well as price movements. Kindleberger observes that “if allowance is made for the unprovable but generally accepted fact that improvement in the quality of manufactures over the past eighty years has been greater than that of primary products, the terms of trade may have turned against manufactures and in favour of raw materials of equal quality, however that may be defined”.

The conclusions which emerge from these comparisons are therefore that we are currently experiencing one of the periodic swings in the terms of trade against agricultural products but that there is no basis for expecting that the long run trend must necessarily be in this direction. Actual trends to be experienced will depend on a complex of factors including *inter alia*—

- (a) *the operation of Engel’s law under conditions of economic development.* Income elasticities of demand, it is necessary to remember, are still quite high in the under-developed regions.
- (b) *rates of productivity increase in agriculture relative to industry.*
- (c) *increases in demand for foodstuffs.* This will in turn depend partly on (a) but partly on the extent to which the growth of income is due to rising levels of income per head or to increasing population. A given increase in income will usually have more effect on the demand for foodstuffs if in the form of an increase in population than in the form of rising levels of per capita income.
- (d) *the extent to which increases in productivity in agriculture and industry are passed on to consumers.* An important part of this

⁴E. M. Ojala, *Agriculture and Economic Progress*, Oxford 1952.

⁵*Op. cit.*, p. 263.

question is the extent to which group or government measures to support agricultural prices succeed in their objective. The terms of exchange for agricultural producers in one country will be profoundly influenced by such action in other countries. Moreover, even in aggregate agriculture's terms of exchange may in the long run be worsened by attempts to hold up farm prices, which result in inflexible production patterns. I suspect that this factor may well be one of the major causes underlying the present deterioration in the international terms of trade for agriculture.

SOME SPECULATIONS ON THE FUTURE

The terms of trade which will emerge from this complex are anybody's guess. Each of us will have his own vision of the likely importance of the above and other factors.

The Australian situation contains several favourable features including:

- (i) the composition of our rural output which has enabled us to expand considerably the volume of our primary exports at a rate considerably in excess of the growth of world trade in agricultural products as a whole;
- (ii) our very high rate of population growth which puts a rather different complexion on expansion of output for many of our agricultural products;
- (iii) the fact that resource mobility in our agriculture is by no means as bad as in many overseas countries, e.g. some areas of the United States.

However, the future terms of exchange for Australian agriculture will be shaped to a very considerable extent by events overseas. They will be influenced for example by the impact on our export returns of measures for the international disposal of American surpluses, by the domestic agricultural policies of the United Kingdom and by the extent to which world trade is splintered by national policies and by programmes of regional integration such as the European Economic Community.

Even for the United States there are very wide differences of opinion on the question of likely future relative factor and commodity prices for agriculture. Earl Heady in a recent article⁶ sees the problem as one of divergence between agricultural incomes and incomes in the rest of the economy, with productivity continually outstripping the growth of demand, and claims that agricultural extension should be directed to cost-reducing rather than output-increasing innovations to the promotion of resource mobility generally and particularly to facilitating the movement of resources from agriculture to non-farm activities.

⁶ Earl O. Heady, "Adaptation of Extension Education and Auxiliary Aids to the Basic Economic Problem of Agriculture", *Journal of Farm Economics*, Vol. XXXIX, No. 1 (Feb. 1957).

Bressler⁷ on the other hand suggested that entirely aside from the fact that most cost-reducing adjustments release resources for other farm employments, and so in the aggregate must be output-expanding, this proposal appears to be overly influenced by the immediate surplus situation. He argues that in order to cope with an assumed increase of 35 per cent. in the United States population during the next twenty years, American agricultural output will have to be expanded at a rate not simply equivalent to the remarkable increases achieved during the past twenty years but 40 per cent. higher than these record rates even allowing for the fact that present real surpluses and the production suppressed by acreage restrictions and control programmes represent a substantial proportion of net output.

Bressler believes that the increase in the 1935-55 period was due largely to a number of non-recurring factors including the substitution of tractors and gasoline for workstock and farm produced feed (releasing 40 million acres of cropland), the long run of favourable seasons and the change from the depressed conditions of the early 'thirties.

Most American agricultural economists would not entirely agree with Bressler and would point to the existence of a substantial pile of unapplied technology capable of major contributions to increased output. Certainly when we consider the potential of the under-developed South and the possible impact of a few simple adjustments in farm practice, the scope for increased output seems enormous. For example, very greatly increased production throughout the corn-belt could follow the introduction of the corn-corn-soyabeans rotation in replacement of the present typical corn-corn-oats-meadow-meadow.

Adjustment of American agriculture currently appears to be proceeding much more rapidly than during the last two or three decades. The U.S. farm population dropped from 27.1 to 21.9 million between 1947 and 1954, a greater decline than occurred during the previous 37 years. Moreover, 684,000 farm units vanished between 1950 and 1956, twice the decline in the twenty years 1920-40. When it is recognised, however, that 63 per cent. of American cotton growers planted less than 15 acres in 1954 it can be seen that the readjustments still have a fair way to go. It would be quite misleading to imply that the accelerated rate of adjustment signified such a rapid elimination of maladjustments that the United States agricultural situation will soon no longer be a major depressing influence on the terms of exchange for farmers in other countries.

Nor outside the United States are the factors likely to influence the terms of trade of Australia's agricultural products wholly reassuring. Policies of agricultural protection are deeply entrenched in Europe and are becoming so in the under-developed countries. The added rigidity of the new United Kingdom system of forward assurances means that we may expect to continue to encounter heavily subsidised competition in this market from domestic producers. Moreover, a bifocal view of export subsidies seems well established in G.A.T.T.

The question of future terms of exchange for agriculture is therefore a very speculative one probably best left to those hardy souls who practise as applied economists in the highest sense of the term—the

⁷ R. G. Bressler, Jr., "Farm Technology and the Race with Population", *Journal of Farm Economics*, Vol. XXXIX, No. 4 (Nov. 1957).

economic outlook specialists of the B.A.E. for example—to whom abstraction is available as a tool but not as a refuge. My own assessment, for what it is worth, would be that while there are perhaps no strong grounds for expecting any further serious adverse movement in the terms of trade for Australian agriculture neither can we look with any optimism to any major early improvement. I feel we cannot be very hopeful about:

- (a) reversal or declining importance of American policies of international disposal of surpluses.
- (b) the prospects of securing observance of any code of behaviour in international trade to avoid beggar-my-neighbour policies.
- (c) the willingness of the Australian community to accept the consequences of our own attempts to enlarge trading opportunities.

THE TERMS OF TRADE AND AGRICULTURAL POLICY

Sweeping policy conclusions based on analysis of the terms of trade are fraught with danger. A setback in agriculture's terms of exchange should not necessarily be interpreted as a go-slow signal for agricultural development. Nor should improvement in relative prices of agricultural products be taken as the green light for all-out expansion of farm production.

The terms of trade for agriculture is an overall relationship. Within it very wide divergences may exist between movement in the terms of exchange for particular commodities or commodity groups. Moreover, movements in the unit purchasing power of commodities do not in themselves signify much for policy purposes. The relevant consideration is the marginal productivity of resources in particular alternative uses and changes in the terms of exchange are but one of a large number of factors affecting this.

As I believe that too close a concern in agricultural policy with the terms of exchange (in the form of parity ratios and costs of production movements) has been one of the main factors contributing to the inflexibility of production aggravating the current world agricultural situation, I found it somewhat alarming at the F.A.O. Working Party on Agricultural Support Measures to encounter a marked tendency to press for the wider adoption of price supports and to discount the scope for alternative programmes directly aimed at the correction of the underlying maladjustments in agriculture. In support of this attitude it was argued that price supports could not be replaced by direct measures to promote adjustments towards greater productivity since under conditions of inelastic demand for agricultural products greater productivity would not accrue to farmers through higher incomes but would result in a more than proportionate decline in prices received.

This argument represents, in my view, the same type of partial analysis as in the propositions put forward on the need for the United Kingdom to expand agriculture to avoid adverse terms of trade movements. The terms of trade for agriculture are not determined solely by movements along the demand curve. Income effects are as important

in the relationships between agriculture and the rest of the economy as they are in the international payments mechanism.

In any case an important point overlooked is that direct measures to correct maladjustments need not apply over the whole range of farms engaged in production. If action is taken to correct maladjustments on low income farms the expansion in output for the industry as a whole will be proportionately much less than for the particular farms concerned.

Trends in the terms of trade have also been of some importance for post-war wage policy in Australia, some emphasis having been placed on this concept by the Arbitration Court as an indicator of capacity to pay. That this is not without danger to external equilibrium is demonstrated by a recent article by Meade and Russell⁸ which argues that because of certain features in the Australian economy, an improvement in our overseas terms of trade may give rise to a worsening of the international balance of payments. Some aspects of the model used in this article may be questioned. However, we can certainly agree that a redistributive policy raising money wages whenever a favourable swing in the terms of trade permits, will likely have the kind of result Meade and Russell suggest. A unilateral policy which regards every temporary favourable fluctuation in the terms of trade as an opportunity to redistribute income at agriculture's expense (with adverse movements too often also the occasion for loading farm costs by means of import restrictions) is hardly favourable to the long run balance of payments situation.

*Movements in Prices Received and Paid by Farmers
and Parity Ratio*

| AUSTRALIA Average 3 years ended 1938/39 = 100 | | | | | | | |
|---|-----------------|--------------------------|--------------|-------------|--------------|--------------------------|--------------|
| Year | Prices Received | | | Prices Paid | Parity Ratio | | |
| | Wool | Products other than wool | All products | | Wool | Products other than wool | All products |
| | (a) | (a) | (b) | (b) | | | |
| 1945/46 | 118 | 169 | 159 | 135 | 88 | 125 | 118 |
| 1946/47 | 187 | 185 | 187 | 139 | 135 | 133 | 135 |
| 1947/48 | 301 | 230 | 243 | 150 | 201 | 153 | 162 |
| 1948/49 | 366 | 225 | 271 | 169 | 217 | 133 | 160 |
| 1949/50 | 483 | 261 | 313 | 187 | 258 | 140 | 167 |
| 1950/51 | 1098 | 308 | 486 | 223 | 492 | 138 | 218 |
| 1951/52 | 552 | 363 | 425 | 285 | 194 | 127 | 149 |
| 1952/53 | 623 | 379 | 439 | 306 | 204 | 124 | 143 |
| 1953/54 | 621 | 364 | 441 | 313 | 198 | 116 | 141 |
| 1954/55 | 540 | 362 | 411 | 315 | 171 | 115 | 130 |
| 1955/56 | 468 | 373 | 411 | 325 | 144 | 115 | 127 |
| 1956/57 | 607 | 372 | 441 | 341 | 178 | 109 | 129 |
| Sept. '57 | (566) | (370) | 432 | 346 | (164) | (107) | 125 |
| Dec. '57 | | | 414 | 350 | | | 118 |

⁸ J. E. Meade and E. A. Russell, "Wage Rates, the Cost of Living and the Balance of Payments", *The Economic Record*, Vol. XXXII, No. 64 (April 1957).

| UNITED STATES (1935-39 = 100) | | | | UNITED KINGDOM (1938 = 100) | | |
|-------------------------------|-----------------|-------------|--------------|-----------------------------|-----------------|--------------|
| Year | Prices Received | Prices Paid | Parity Ratio | Prices Received | Prices Paid (c) | Parity Ratio |
| 1945 | 192 | 151 | 127 | 193 | 167 | 116 |
| 1946 | 218 | 165 | 132 | 203 | 173 | 118 |
| 1947 | 257 | 192 | 134 | 236 | 189 | 125 |
| 1948 | 267 | 208 | 128 | 244 | 216 | 113 |
| 1949 | 233 | 200 | 116 | 255 | 227 | 112 |
| 1950 | 240 | 204 | 118 | 265 | 259 | 102 |
| 1951 | 281 | 225 | 125 | 290 | 315 | 92 |
| 1952 | 268 | 229 | 117 | 300 | 323 | 93 |
| 1953 | 240 | 223 | 108 | 306 | 323 | 95 |
| 1954 | 222 | 223 | 100 | 304 | 325 | 93 |
| 1955 | 220 | 222 | 99 | 322 | 336 | 96 |
| 1956 | 218 | 228 | 96 | | | |
| Oct. '57 | 223 | 236 | 94 | | | |

- (a) Commonwealth Bureau of Census and Statistics Index of Agricultural Prices.
 (b) B.A.E. Index of Prices Received and Paid (converted to pre-war base by use of factors 2.34 for prices received and 1.59 for prices paid).
 (c) General wholesale price index, Board of Trade (old series).

DISCUSSION

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I agree with the three major points made in Professor Lewis's paper.

- (1) Too much should not be made of the terms of trade.
- (2) Long term prospects depend very heavily on United States developments and policies.
- (3) Altogether the outlook is very uncertain.

As regards (1) Professor Lewis recognises that the concept is an overall relationship. He points out that wide divergencies may exist between the movements of the terms of exchange for particular commodities, that the relevant consideration is the marginal productivity of resources in particular alternative uses, and that changes in the terms of trade are only one of the factors affecting this.

This term however is used to cover at least half a dozen different measures and Professor Lewis might well have drawn a distinction between the commodity terms of trade, income terms of trade, factorial and double factorial terms of trade, between the average terms of trade and the marginal. Different concepts are important in relation to different problems.

Professor Lewis could have developed his subject more satisfactorily if he had allowed for the basic distinction between food and raw materials, for which movements in the terms of trade are liable to differ considerably. Another useful refinement would have been the distinction between energy foods and protective foods, which are often found to show markedly different responses to income changes.

On the longer term issue, Professor Lewis has brought out two important generalisations. One is that very much depends on what happens in the United States, and the other one is that there are good reasons for expecting marked instability in the prices of some important primary commodities over the longer term.

The key to the American situation seems to be provided by what McDougall has called the "explosiveness" of U.S. import demand. Imports supply only a very small proportion of total demand in the U.S. market. A very small rise in domestic demand due say to income or population increase, or a very small decline in domestic supply perhaps due to bad weather, can lead to a big increase in imports. To take a hypothetical example, if at one time 99 per cent. of U.S. demand for dairy products is supplied domestically and 1 per cent. by imports, then if demand rises by 2 per cent. as a result of population increase and if only half that increase can be met from domestic resources it will mean that almost 2 per cent. of total demand will now have to be met by imported supplies and that consequently import demand will double. Minute changes in U.S. total domestic demand and supply can result in huge changes in import demand; to some extent similar considerations apply to other large potential or actual food importers (e.g. India) who customarily pro-

duce, or try to produce domestically, the bulk of their food requirements. European countries and especially the U.K. have also in recent years become less dependent on imported supplies. And there are strong indications that the proportion of food needs supplied from domestic resources is still rising in many continental countries. To that extent their import demand, too, is becoming more explosive.

Sharp swings will therefore continue to occur in the demand for food products as well as with materials in the world market and in their terms of exchange against manufactured products. These fluctuations will be independent of and in addition to other fluctuations which may result from the uneven pace of economic expansion in industrial countries.

The outlook for primary products has not always been viewed in these terms. Quite recently there was a time when leading crystal gazers took the view that the terms of trade for primary products would be stable if not indeed rising quite markedly over the longer term. Today a straw vote among economists would reveal a less optimistic climate than prevailed six or eight years ago. The uncertainty that surrounds future developments is by no means entirely due to our ignorance of the factors which shape future developments. We know pretty well just what determines the position of the pendulum at any time, but the trouble is that a very small impulse may reverse its direction and very small impulses are bound to be beyond the range of prediction.

If what I have said about the explosiveness of the demand for primary products is right, it must follow that whatever the longer term trend in agriculture's term of trade is going to be, sharp fluctuations around that trend will be a prominent (possibly an increasingly prominent) feature of the situation. To that extent production of primary products for exports is likely to become if anything a more risky proposition in the future than it has been in the past, and therefore, other things being equal, a less profitable one than production for the domestic market. And if heroically neglecting a large host of factors on the supply side and possible variations in the riskiness of other enterprises, we were to try to press this argument to its bitter conclusion we would, I think, be bound to find that the case for channelling economic resources into industries serving the domestic market rather than the export market has in recent years become stronger.