DEPRESSED AGRICULTURAL AREAS AND LOCATION ECONOMICS*

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1. *The Problem and its Setting*

This paper aims to investigate the effects of a decline in the agricultural income of a predominantly agricultural region. For the purposes of the investigation all industries will be classified as either " export " or " local " industries with respect to the region. Export industries (in this case agriculture) produce goods or services, some of which are exported from the region, whereas local industries produce entirely for the local market. The decline in the profitability of agriculture may result from a decline in soil fertility, from the opening up of new lands for producing the products which the region produces, from restrictive trade policies followed in other countries or from the region being unsuitable for cost reducing innovations which are introduced in other regions, e.g., the topography may make mechanization impossible. In any of these cases farmers and farm workers find that their incomes have fallen relative to the national average.

Regions which face, or have faced, these conditions can be found in many parts of the world. Our region could be in Scotland or Wales, in the Appalachian hill country of the United States or in some dairying area of Queensland or the N.S.W. North Coast. A common characteristic of the regions is that agriculture in its traditional form can no longer provide an adequate standard of living. At the same time there is general agreement that the areas can be farmed profitably, in some cases if the traditional product is produced on larger holdings than at present exist, and in other cases if sufficient amalgamations take place to permit a different and more extensive form of agriculture to be adopted. Amalgamation of holdings may be sufficient in low income Australian dairy farms while it probably requires that Scottish crofters and Welsh hill sheep farmers give way to an altogether different, ranching type agriculture.

One effect of falling incomes which would be expected is that migration from the region would occur. However Schultz and Bellerby have pointed out a number of reasons why this migration may be quite slow even in the presence of a considerable variation between income levels in our region and elsewhere. Broadly the existence of important inertias, due to costs of transfer of residence and the lack of transferability of agricultural skills, results often in the maintenance of considerable differences in income between declining and other regions.

The economist's prescription for these areas has commonly been that resources must be moved out. But in general he has conceded that for humanitarian and social reasons the harsh winds of the free price system should be tempered in the short run to allow adjustment without too much hardship.[1] An example of such a prescription is to be found in the

*I am indebted to Mr. F. H. Gruen for comments on an earlier draft.

1. T. W. Schultz has given a sophisticated and closely reasoned statement of the humanitarian case for assistance to resource owners in declining regions and suggests that assistance may in fact aid adjustment. " A Policy to Redistribute Losses from Economic Progress ", *Journal of Farm Economics*, Vol. 43, pp. 554-565 (1961).

Dairy Industry Committee of Enquiry, Report. Most recommendations to this Committee differed only in the type and extent of short run cushioning.

The analysis presented in my paper differs from this type of prescription in one respect. The long run objective—reduction in the resources employed—is the same, but I would suggest that there are important economic (as distinct from social and humanitarian) reasons why the price mechanism should not be allowed to operate unfettered in the short run. Indeed it seems to me that the long run objective can be achieved more rapidly, certainly more easily, and with greater economic efficiency if the government adopts an appropriate form of subsidy policy in the short run.

There are two main parts to the analysis. Firstly it is argued that the adjustment process under the unfettered price mechanism is inefficient and secondly an appropriate form of government policy is outlined—one that will help rather than hinder adjustment.

2. *Expected Adjustment*

There are two ways in which the fall in relative income in the region would be expected to be arrested so that a new equilibrium relationship between the level of income in our region and in the remainder of the country would be established.

(a) Lower incomes in the region will mean lower labour costs and the decline in economic activity will mean that surplus capacity (and hence lower costs) will occur in capital as well as labour. The decline in labour costs may be lessened in the presence of uniform wage legislation but can still be expected to be present in the form of differences in over-award payments, in labour turnover rates and other labour cost variations. Export industries other than agriculture would be expected to be attracted by the lower costs, and regional incomes will only fall until the level of costs, relative to the remainder of the country, is low enough to attract alternative export industries. (Local industries cannot expand to take advantage of lower local costs because their level of output is dependent on the level of demand in the local market.)

(b) Declining population will lead to an increasingly favourable ratio of resources to people. Hence we would expect consolidation of holdings and regional income will only fall until the remaining differential is just sufficient to prevent further migration out.

Both of these processes would be expected to occur together and in fact both can be seen as resulting from excess capacity and hence cheapness of factors of production. Under (b) the new export activity which is taking advantage of such conditions (mainly cheaper land) is more extensive agriculture.

3. *The Efficiency of the Adjustment Process*

Unfortunately we cannot be sure that either of the above equilibrating processes will work without very considerable wastage of resources, and in some cases they may not work at all. The essential difference between the necessary adjustment process here and the type of adjustment which is common is that we are here dealing with a region as well as with an industry. When an industry which employs a small proportion of the labour force in a city declines, withdrawal of resources is relatively painless. Workers change their jobs, but not their homes; and entrepreneurs change their investment in plant and possibly in buildings. When a whole region is heavily dependent on an industry which declines then, in the absence of an alternative "export" industry some resources must physically migrate and immobile resources must be scrapped.

We can examine some of the reasons under the two headings under which the adjustment process has been examined above.

(a) New non-agricultural export industries. Much of the following analysis would apply to relatively isolated areas where non-agricultural export industries (e.g. cotton manufacture) had declined. But there is one important difference. In such cases some of the buildings and even the machinery of the declining industry may be of value to a potential new export industry. Agriculture shares with mining the feature that its capital installations are of little value to other industries. Excess farm buildings and fences will not attract manufacturing industries.[2]

Labour, on the other hand, will tend to be relatively cheap and will be of some value to other industries despite its lack of industrial skills. There are a number of industries, principally in the textile, clothing and jewellery groups in which labour costs are sufficiently important for them to be attracted to cheap labour sources. However there are a number of reasons why agricultural regions cannot hope for much from this direction. In addition the literature on the failure of decentralization in Australia gives plenty of evidence of the difficulties which country towns encounter when they attempt to attract manufacturing industries.

Among the most important reasons for this, and for the attraction of a metropolitan location, is the lack of industrial services such as advertising, insurance, accounting, machinery servicing and parts manufacturers in country towns. Also it is much more difficult to sell in the metropolitan market from a country town. This is not simply a reflection of the cost of transporting the products but is more a reflection of the infrequency of transport services. If the manufacturer serves a state wide or national market he will find that non-metropolitan locations lack direct communications and transport services with most parts of the State, because of the way communication routes tend to radiate from the metropolitan centres. Reeves pointed out that for country industries in Victoria to compete with those in Melbourne, " it would require, not merely concessional rates to other regions to make allowance for Melbourne's advantage, but zero rates to Melbourne itself with concessional rates with respect to those regions ".[3]

A further important disadvantage of location in a small town is a lack of a reserve of skilled labour which can be called upon to fill any sudden need to either replace workers or expand production. In addition labour of the particular type required may limit the possible future expansion of the firm. Manufacturers moving to small towns find it difficult to attract skilled technicians and managers because of the attractions of city life. They may be subject to strong local political pressures if, at any time, they decide to reduce their labour force. Partly as a result of these factors we find that even textile and standardized clothing manufacturers seldom locate in towns in Australia with populations less than about 3,000 to 4,000. Depressed agricultural areas can hope for little relief from decentralization of manufacturing partly because only larger country centres are likely to be successful in attracting country industries and partly because there is strong competition among country towns for that (limited) part of manufacturing which is susceptible to decentralization.

2. The decline in the " salvage value " of the factors employed in farming as a result of decline in agricultural prosperity is seen by Glenn L. Johnson as an important reason for lags in adjustment of resource use. e.g. " The Labour Utilization Problem in European & American Agriculture ", *Journal of Agricultural Economics*, Vol. 14, pp. 73-87 (1960).

3. Reeves, J. H., " Transport Costs and the Location of Industry ", *Economic Record*, Vol. 27, pp. 231-236 (1951).

(b) Consolidation of Holdings. In those areas where the change to the more extensive type of farming which would be viable under prevailing economic conditions involves more than simple consolidation of pairs of existing holdings, adjustment by amalgamation is a very uncertain procedure. Migration from agricultural regions due to a fall in relative income is generally slow and piecemeal. Rather than a whole group of say Scottish crofters leaving the area to permit the 20 acre crofts to be amalgamated into a 2,000 acre viable extensive farm, amalgamations are likely to take the form of doubling the size of properties. Although in some areas that would be sufficient to raise farm incomes to a satisfactory level in others this would not be so. The former areas (which probably include many of Australia's low income dairying areas) face a rather easier adjustment process than the latter.

(c) Other Barriers to Adjustment.

(i) Land Values. The decline in productivity in the region will lead to a decline in land values. This will delay migration because the farmer who contemplates selling out faces a capital loss and may be unable to meet his debts. Most farmers in the region will have suffered such a capital loss and, to the extent that the market for land is a local one, this lack of capital will cause market values of land to decline more rapidly than productive values. It is not certain that the decline in land values will be reinforced in this way if local farmers hope to regain some of their lost capital in the future. There will almost certainly be capital losses which will tend to retard migration but whether the decline will be more or less rapid than the decline in productive values depends on the relative strength of these two influences. In any case the capital losses in the area are likely to retard the buying up of adjacent properties by local land holders. Land values may have to decline sufficiently to attract buyers from outside the region. Thus again the process of adjustment is hampered.

(ii) Selective Migration. It can easily be argued that the migration of agricultural population under these kind of conditions is likely to be selective. Those who have the most energy and initiative find out the opportunities which exist elsewhere and are able to adapt their skills and way of life to different circumstances. J. M. Ritchie examines many of the features of isolated agricultural areas and expresses the probability of selective migration as " . . . What appears more certain is the addiction of the lower intelligence quotients towards the place of their birth and breeding. This is also a matter of observation between those that stay and those that leave specific places ".[4] Greenhalg has argued that the same phenomenon occurs in Australia during the general drift of population from rural areas and presents some evidence of it in the New England area.[5] Selective migration will impede the adjustment process in that those who remain in the area will be less able to adjust to the new way of farming which is necessary.

(iii) Cost of Local Industries. The total effect of the decline on regional income considerably exceeds the initial effect in the agricultural industry. This can be expressed as a regional multiplier, very similar in effect to the international trade multiplier. The decline in incomes of farmers is reflected in a decline in their spending on the products of local industries. This in turn is passed on. The value of the regional multiplier is the reciprocal of one minus the marginal propensity to spend on products

4. Ritchie, J. M., " Some Observations on the Problems of Hill and Marginal Land ", *Economic Journal*, Vol. 60, p. 749 (1950).
5. Greenhalg, A. J., " Talent Erosion ", *Australian Quarterly*, Vol. 20, March 1948, pp. 79-86.

produced in the region. We can make the assumption that employment is proportional to income and then the value of the employment multiplier is the same as that of the income multiplier (as described above). However if income levels have to decline in order to encourage migration from the region the regional employment multiplier will be smaller.[6]

The effects of a decline in income and employment in the region on the cost of local goods and services, assuming that no new export industry appears, can be traced in terms of the conditions faced by the industries producing goods and services for the local market. For this purpose it is convenient to separate industries in which goods and (mainly) services are produced by local authorities from those where production is by private enterprise.

(1) Publicly provided services. Here we are concerned with authorities which are financed by local rates or charges. We have already decided that the rateable value of land will have declined, so that, to the extent that the authority depends on rates on agricultural land, its sources of finances will be depleted. We shall see in the next section (though it is intuitively fairly obvious) that the profitability of private industries serving the local market, and hence the rateable value of their property, will also be lowered. Under those circumstances the local authority can either lower the level of services provided in line with its lowered income, or it can increase the level of rates and attempt to keep the level of service provision approximately constant.

At first sight it might appear that a local authority can avoid either of these unpleasant alternatives by reducing its expenditure in line with the population decrease and maintaining the level of service provision for those that remain without increasing its rate charges. However it is only in a minority of publicly provided services that declining population will permit a significant decline in expenditure on services, if the level of services to the remainder are to be maintained. Decreases in population do not take the convenient form of complete depopulation of rural areas at the ends of roads or of city areas at the end of sewerage mains, water mains, city streets or electricity supply mains. Similarly once a certain level of provision of parks and sports fields has been established very few economies are available simply as a result of declining population. In short, whether or not there are economies of scale in the long run in the provision of these services, increasing costs are particularly evident when a decline in scale is required because of the very long life of much of the capital involved.

The length of life of individual capital installations is often reinforced by the complementarity which exists between different parts of the equipment. Thus a particular road or part of a road is so little used that if it were to wear out its replacement, considered by itself, would not be justified. Nevertheless it will frequently be replaced because of the fact that non-replacement would involve abandonment of other parts of the road network, or of the road itself, which have not worn out. Similar considerations come into force when some parts of recreational or other facilities require replacement. As a result the long run, in which an authority could move along the long run cost curve in its service provisions, may be very long indeed.

There is another reason why a decline in population is particularly

6. Two attempts have been made to measure the value of the regional multiplier as described here. Borge Barfod (*Local Economic Effects of a Large Scale Industrial Undertaking*, O.U.P. 1938) measured the *ex ante* income multiplier assuming that a large oil refinery in Aarhus ceased operation. M. C. Daly (" An Approximation to a Geographic Multiplier ", *Economic Journal*, Vol. 50, pp, 248-258, 1940) attempted to measure the *ex post* employment multiplier for regions in Great Britain for 1921 to 1931.

important in its effects on local authority costs. If a private firm built a toll road to a small isolated settlement and then the settlement was abandoned the firm would write off the capital involved and only the shareholders in the firm would be worse off. However if a local authority borrows money to build such a road, when the settlement is abandoned the authority still has to pay off the loan and the cost is a charge on the whole ratepaying community. Because local authorities cannot write off debts in the same way as a private firm its charging policy is distorted.

In summary we can say that the level of rate charges must be increased in a declining region if the level of service provision is maintained. Probably there will be a combination of increased rate charges and a decline in the level of service provision. Both of these changes will reduce the real income of the population of the region. Also, to the extent that government provided services are necessary to permit the operation of private services (such as roads to permit private bus services and local freight carriage) the cost of private services will also be increased. Again, to the extent that private service industries can pass on such cost increases the real income in the region will be further decreased. To the extent that they cannot pass on these costs the rateable value of their properties will suffer a further decline.

(2) Privately provided services. Private service industries will be affected by the indivisibility of capital equipment in the same way as public service industries. However we need to distinguish carefully the conditions under which this will apply. If there are five groceries in a town and there is a 20% decline in the demand for the services of groceries, we would expect the least efficient (unfortunately it is more likely to be the one with the lowest reserves) to go out of business. The only losers will be the owners of the capital involved and the remaining groceries will provide the same level of service at the same avarage cost.

However if there is only one grocery which suffers a 20% decline in turnover it may well find that the average cost of provision of the same level of service as before has increased. For example the costs of maintenance and depreciation of the building, the capital costs of holding stocks and, especially if it is a one man store in a small centre, the labour costs, per unit of turnover will have increased. It is fairly obvious that most public service industries come into the "one establishment" category. There are many other private service industries where these effects are very noticeable, e.g. butchering, where minimal slaughtering conditions must be maintained, general medical practice and catering. We have not included interest charges on fixed capital among the costs which will rise as business falls because a portion of the capital value of the building should be written off so that it should not affect the businessman's pricing policy. In actual fact many firms in such circumstances will be local monopolists (almost by definition) so that it is by no means clear that they will not recover such costs through their pricing policy.

In summary we can say that the changes which will result in a region from decline in the agricultural industry can create both hardship and considerable inefficiency in utilization of resources. Hardship results directly from the decline in real income in the region before the adjustment process comes fully into effect. Resource utilization is non-optimal as long as the resources in the area are being used in a type of farming which is not profitable. The economic pattern which will be viable will involve not only more extensive agriculture but also the disappearance of some local service centres and severe restriction in the functions performed by others. The process of getting to this new equilibrium, depending on the free market, can be condemned both because of waste of resources and the hardship involved.

4. *The Welfare Economics of Regional Decline*

If the above arguments which emphasize the importance of the induced effects of the original decline in the region are accepted, we can ask ourselves in what way the price mechanism has failed in promoting the orderly transition to the new equilibrium. When we have answered this question we will be in a position to prescribe remedies for the malaise.

(a) External effects of location decisions. One of the classic ways in which the price mechanism fails to lead to welfare maximizing production decisions is because the production decisions of one entrepreneur influence the productivity of other firms. Nowhere is this more obvious than in the particular production decision which concerns the location of production. Thus we can see that the original farmers who decide to migrate from the region do not take into account the effects of their decision on the costs of services of different kinds to other farmers and residents. The external effect is on the productivity of local industries.

Similarly the decisions of entrepreneurs in local industries to leave the region do not take into account the effect of their decisions on the size of the market and hence the productivity of other local industries. An example of these external effects would occur if say one farmer, in an area where three farms produce milk for a cheese factory, were to sell his farm for extensive grazing. The collection cost for the other two would be raised.

There would seem to be a justification for a short run subsidy to prevent the onset of this process of decline. In my opinion this is the best justification for agricultural subsidies in many parts of the world. In the short run the opportunity cost of much of the capital involved in local services is very low. But such a short run policy tends to perpetuate itself because it encourages local investment.

It is also true, of course, that manufacturers who consider location in such a region do not take into account the external benefits of such a location decision. These benefits would be the reverse of the detrimental effects discussed above and include the spreading of overhead costs of local industries, resulting in lower costs, not only to themselves, but also to all other firms and residents in the region. Hence there is a justification for subsidizing industries which are prepared to locate in such areas. This is an important justification for a decentralization policy in Australia. There might be room for local action to encourage local industrialization such as occurred in the United States in the 1920's and 1930's. It might be possible to find a *raison d'etre* in the various New State Movements in that they want the power to promote local industrialization. However to a large extent their areas are too large for the kind of purpose suggested above. A much greater degree of political devolution would be required to permit a significant amount of encouragement to industrialization in rural areas.

(b) Capital limitation. Welfare maximization by means of the crude price mechanism assumes that, at a given rate of interest, there is no limit to the amount of capital available to the entrepreneur. However farming does not lend itself to the spread of the risk of capital loss among shareholders, partly because of the disadvantages of raising share capital in small quantities and partly because of the difficulty in control over a small farm by a board of directors. Hence farmers are dependent on lending by banks and other institutions which lend on fixed interest and demand, above all, security. As a result, if a farmer's equity (security) declines in value in a region he is in a particularly poor position to try to raise further credit for the purpose of enlarging his holding. This would suggest that it may help to speed the adjustment process and reduce some of the wastes which occur on the way if special sources of credit (perhaps supervised) were made available to farmers in declining agricultural areas, who want to enlarge their holding to a size that will be profitable in the long run.

5. *Appropriate Policy*

The justification which a welfare examination of regional decline gives for agricultural support is strictly a short run justification. In the long run our policy must be designed to move resources to the more extensive form of agriculture and move resources out of such regions altogether. In the new situation the income per head in the more extensive agriculture must be high enough to permit farmers and farm workers to travel greater distances for their local services and at the same time permit their real incomes to compare reasonably favourably with incomes in the remainder of the community. To get to such a situation there will inevitably be capital losses in agriculture and in other industries. It can be argued on two levels that it would pay the community to bear these capital costs. The first argument would be that it would pay because of the inefficiency of utilization of resources and hardship during the normal rather long adjustment period. The second argument would apply in countries which at present give considerable support to agricultural industries. Given this support as it now exists it may be cheaper for the community to spend a large capital sum in rehabilitating these regions than to subsidize agriculture (in prosperous as well as depressed areas) indefinitely. In the absence of either agricultural support or adjustment aid depressed agricultural areas may decline to the point of abandonment before the more extensive form can be established. This apparently occurred in parts of North Eastern U.S.A. in the inter-war period. The British Small Farm Scheme would appear to be partly aimed at the kind of adjustment aid proposed, though its emphasis on amalgamations is not very noticeable. The Dairy Industry Committee's recommendations also contain elements of an adjustment policy of this type.

What is required is some co-ordination in the processes of amalgamation and movement of resources out of the area. The extensive grazier is not going to obtain the full benefits of the change in the intensity of his farming until local service industries are again on a sound financial basis and able to provide their goods and services at reasonable cost. (Our policy proposals from here on to some extent ignore the criterion of political practicability.)

For agriculture this would probably involve government purchase of all of the farms in an area at the market price, given the present level of subsidy. The farms would then be combined and the larger farms sold as extensive grazing properties, with the proviso that the new owners would not be entitled to any subsidy (should there be a subsidy on their produce). The government would have to bear the capital cost caused by the difference between the two land values. In order for this to work it would be necessary to be able to subsidize agriculture on a farm by farm, or at least an area by area basis.

Local authorities should be reorganized to serve larger areas, debts incurred to provide services which will no longer be required should be taken over by the central government and various services closed or restricted. Local service provision should be re-planned, firms compensated for their loss of property value and the local service firms which are permitted to remain in operation could be resold with the buyers fully aware of the scale of the market likely to remain after the regional reorganization.

The type of compensation suggested is concerned with the non- labour resources owned and employed by farm people. To the extent that farmers and farm workers find that their skills are not easily adapted to other regions or occupations, and that physical movement is costly for them, they should also be compensated. This would take the form of training in alternative occupations and payment of household removal expenses. Such programmes have frequently been suggested in the United States.

Rather than regarding these as concrete policy proposals it is preferable to think of them as in some sense an ideal from which compromise policies can be worked out. If this paper can be considered as having an axe to grind it is to press the view that agricultural problem areas should be seen as areas in which the local authorities and local service industries are as intimately concerned with the future of the area as are the farmers themselves.

6. *Summary*

The laissez faire adjustment path following a decline in the comparative advantage of a region is widely recognized to be too slow. Withdrawal of resources from the region occurs only after a significant lag due to the many inertias which are present. These inertias are particularly important because resources must be moved from the region, rather than simply between industries.

It also seems likely that, when the level of resource employment in the region has fallen to the optimal level for the new conditions, regional income will still be low. Thus a further movement of resources out of the region will be stimulated, causing an excessively low level of resource employment. It may be only after a very considerable time—after adjustment has taken place in the non-agricultural sectors—that real income will rise and call forth a rise in resource employment to the optimal level. The adjustment paths which may occur after a fall in the profitability of agriculture in a region are illustrated in the following diagram.

A is the optimal level of resource employment in the region before the fall in income, B is the optimal level after the fall, CD is the laissez faire adjustment path, CE is the adjustment path with compensation and CF is the adjustment path when a conventional subsidy is used to avert undue hardship. The shaded areas represent two " areas " in which resource employment in the region is further from the optimum under laissez faire than with adjustment aided by compensation.

The compensation policy advocated can be justified on two grounds. Firstly it leads to more efficient resource use than the free action of the price mechanism. Secondly, compared with the politically practicable alternative, subsidies, it causes much more efficient resource use and probably is less costly.