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RURAL REGIONAL STABILISATION: A PROBLEM AND SOME POLICY OPTIONS

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Abstract

Rural regional economies are subject to a variety of short-run instabilities that arise from dependence on key primary products. The nature of this problem is outlined and some elements of market failure identified. A disaggregated variant of input-output analysis is used to analyse how sector instability relates to region instability and to review the effectiveness of price/income stabilisation policies in stabilising rural regional economies. From that review some principles and suggestions for more effective policies emerge.

Introduction

Because they are typically dependent upon a single industry - and a primary industry at that - rural regions very often exhibit economies that are simpler in structure and organisation than those of urban regions. This structure makes rural regional economies vulnerable to market disturbances that would be buffered by the complex set of industries found in urban regional economies. In addition, rural regions that are dependent upon agriculture may experience economic distress because of adverse weather conditions affecting crops and livestock. Public policies aimed at mitigating economic instability problems in rural regions include direct compensation to agricultural sectors through various types of price support and income payments and countercyclical expenditure programs, such as capital works fund allocations. Long-term policies have been targetted at diversifying that economic structure. Not so much attention has been given to providing incentives to businesses to adopt structures and strategies that are robust with respect to exogenous sources of instability.

The argument advanced in this paper is that some of these public policies to mitigate rural regional instability problems are often misdirected because of a failure to examine the linkages that exist within sectors in even a relatively simple rural economy, and between that rural regional economy and the economies of other regions, both rural and urban. After briefly laying out the basic theory of a regional economy, we will:

- (i) explore the nature of the problem of rural regional stabilisation,
- (ii) examine the implications of instability within a regional economy using a variant of input-output analysis which we shall call "impact component analysis", and
- (iii) critique the main types of public policy assistance typically offered to mitigate rural regional instability,
- (iv) offer some conclusions regarding appropriate types of public policies for addressing rural regional instability problems.

The Problem in a Theoretical Context

The standard theoretical paradigm for understanding the fundamental workings of a regional economy is the export base model (for a discussion see Hewings 1985). While the model has been criticised, it is a useful, if perhaps over-simplified, conceptual framework in regional economics.

The export base model has the premise that the driving force in an open economy is income earned from export sales - i.e., sales to buyers located outside the region of interest. Those export sales may involve sale of goods or services which, in either case, result in a fresh flow of new dollars into the region. Those export earnings are, in turn, spent within the region on local goods and services (some of which may have originated outside the region) or are spent on "imports", purchases of goods and/or services from suppliers outside the region. In general, each dollar of export earnings will result in greater than one dollar of in-regional sales and income because of the multiplier effect. But in simple regions, export earnings may quickly "leak" out of the region to pay for imports; hence multipliers are apt to be low. The bigger the region in terms of its economy, the greater the multiplier. The leakages are a mechanism of spatially spreading the effects of the disturbances. However, it appears inevitable that there will be some strong local linkages that will mean significant flow-on effects to other sectors in the region. In the 'typical' rural region, robustness might be achieved by adding activities that are relatively independent of those sectors subject to external disturbances.

In focusing upon rural regional instability, we confine our attention in this paper to transient disturbances not associated with long term secular or structural changes that involve major shifts in inter-regional comparative advantages. We are concerned with the effects of temporary disturbances in markets of a cyclical, or random nature that affect

only one commodity (if such might legitimately be postulated) or, at most, a relatively few commodities, disturbances in prevailing weather patterns, or other acts of nature, that have impacts on production, or discontinuities in public policies that induce market tremors. The duration of such disturbances are assumed to be too short to allow for long-term adjustments involving reallocation of other than some resources such as working capital and labour inputs.

If capital and labour resources were perfectly mobile, and reallocations of capital and labour could occur at zero costs, there would be no need for public policy to address the problem of rural regional stabilisation. These resources are not perfectly mobile, and because readjustments are not costless, the social costs of reallocation of resources, except at the margin, may be greater than the social costs induced by the disturbances. So the extent that the probabilities of some of the disturbances are knowable and quantifiable, the resulting damages can be mitigated by risk-spreading measures such as crop insurance, forward pricing, etc. Yet not all of the probabilities are knowable and quantifiable, particularly those associated with some market and public policy disturbances and, even in the cases where risk-spreading measures can be accessed, there may be significant transaction costs that exceed the private (if not total social) costs of the disturbances to those who would need to access the risk-spreading measures. In short, the adverse effects of rural regional instability problems are partially embedded in some classic conditions giving rise to market failure - i.e., resource immobility and high transactions and information costs.

In general the effect on a regional economy of a negative disturbance will be a decline in real income in a way analogous to the effect on the Australian economy in the 1980s when the terms of trade for primary products nosedived. At the regional level, this can occur independently of the trend nationally, so that the cushioning and sharing effects that arise through currency devaluation may not be available. Thus, the real income decline will be accommodated by a variety of responses including adjustments to (current, capital and household) expenditure, employment and production plans that will normally fall short of preserving earnings. As a result, there will be equity adjustments associated with either borrowing funds or reducing reserves that mean the region becomes a net borrower. In a national context, this may be assisted by manipulation of other economic variables (e.g. interest rates) that are not usually available to regional economies. The regional economy must attract the capital inflow primarily as loans to businesses and households at a time when there are doubts about future returns. The result is that capital

inflow might be low and/or involve high interest and other costs. Some further compensating net inflows may arise from welfare payments.

The response to "shocks" to rural regional economies will logically depend upon what is the perceived source of the shock (i.e., decline in market price, drought, flood, government policy, etc.), the timing of the event marking the onset of the disturbance (i.e., whether before the onset of a production season or during its midst) and the degree of heterogeneity among affected firms. Disturbances may reduce income flows, but have little or no effect on volumes of output. They may reduce volumes of output while actually increasing incomes in certain sectors of the regional economy and reducing incomes in other sectors. The effects may be confined to a relatively small number of vulnerable firms within a given sector, or may be felt by all the firms in the sector. The important point is that as the causes of regional instability are varied and the firm and industry structure varies, there will be different responses by firms. These different responses will generate differences in flow on effects within that economy. These propositions may be investigated empirically using some type of inter-industry analysis such as input-output analysis. Attention turns to these issues in the next section along with an overview of some empirical findings.

Regional Analysis

The applied analysis task involves two main elements:

- (i) Estimation of the effects of the disturbance; this usually involves identifying the effect of the disturbance on the directly affected sector and then determining the flow-on effects to the rest of the economy; and
- (ii) Indicating the potential for policy action to ameliorate perceived adverse effects.

For sub-state regional analysis a variety of econometric, general equilibrium and inter-industry models can potentially be used. However, in practical terms, input-output models are commonly used because they are available, at least in Australia with the widespread use of the GRIT procedure developed at the University of Queensland (for an early explanation of that procedure see Jensen, Mandeville and Karunaratne (1979). The ORANI model has also been used for sub-state analysis but has not yet been widely used and the performance evaluated (see Johnson 1987). At least for the near future, some

application of input-output models seems likely to be the best method available without large amounts of research funds for model building and development.

In most applications of input-output analysis, a final demand multiplier is applied to an initiating change in final demand to estimate the total (direct plus indirect) impact on an economy of the initiating change. The assumptions employed in making these estimates are generally well known and include those of linearity or proportionality in all changes, a variety of *ceteris paribus* conditions and sufficient time for all effects to have worked their way through the economy. In addition, the model is used to determine real changes in outputs.

In endeavouring to use input-output methods in the analysis of short-run instability issues, a number of these assumptions become critical.

- (i) Many of the initiating changes may be price effects while volumes remain relatively unchanged. In cases of drought effects, reduced production levels may be compensated for by higher prices. Thus, care is needed in handling both the price and volume effects.
- (ii) The short-run responses will almost certainly involve non-proportional changes in expenditures on current inputs and household consumption. That is inherent in the short-run situation where some categories of expenditure may be varied readily while others are relatively fixed.
- (iii) An important element in short-run response is the variation in capital expenditures. These are not normally endogenous in the input-output multiplier analysis but the effects of capital expenditure variations can be calculated as an additional element in the total effects.
- (iv) Multipliers normally incorporate backward linkage effects on the basis that the output from a particular sector is 'final demand'. Thus, the farm sector multiplier takes account of effects only up to the farm gate (for tables constructed using basic values) and, therefore, does not include marketing and processing activities. Changes in the farm sector, particularly volume changes, may have impacts on these 'forward' linked activities and may be taken into account.

- (v) There may also be a number of compensating changes and general equilibrium effects that firms and households may make to offset some of the initiating changes. For example, there may be some change in enterprise mix (say crop to livestock), lower grain prices might stimulate further intensive animal production and lower household incomes may mean some off-farm employment of household members. These may also be taken into account.

In response to requests for analysis of short-run instability in the agricultural sector, a number have been undertaken and an approach named 'impact component analysis' has been developed. The approach draws on the basic and well-known concepts of input-output analysis and makes use of the availability of those tables at the regional level. The approach involves disaggregating and extending the estimated initial impacts to account for the elements discussed above. Thus, the following are identified:

- changes in output levels and values,
- changes in current expenditure (i.e. the sector column),
- changes in household income and consumption,
- changes in capital expenditures, and
- compensating changes in any sectors.

Once these changes are identified, input-output methods are used to estimate the flow-on effects. Thus, this enables many of the limitations of the input-output method to be relaxed, at least for the initial or first-round effects, which represent a large proportion of the total effect and are critical determinants of the size and distribution of the flow-on effects. While it would be possible to extend this analyst intervention beyond the first-round effects, it becomes difficult and cumbersome so that, to date, the conventional input-output approach has been used with the aforementioned limitations applying. Such an approach makes heavy demands on data, some of which are unavailable or unprocurable but, by contact and discussion with key entities in the region, credible estimates have normally been available.

The approach has been applied to studies of price instability, production instability arising from drought and input instability such as where the amount of water available as an input to irrigation farming is variable. Some comments on these three issues follow.

Severe price downturns have occurred in most Australian farming industries over the past decade. Ferris (1987) and Ferris and Powell (1988) investigated the effects of

the downturn in grain prices on a grain producing region while Powell and McGovern (1987) and McGovern, Powell and Tamblyn (1988) have considered the downturn in sugar prices. The results of these studies indicate first, the impacts are smaller and slower than might be predicted from the simple application of input-output methods. This occurs even though the estimates include capital expenditure and some 'forward' or downstream effects.

Second, the effects operate mainly by large changes in relatively few key expenditure variables within each of the current, capital and consumption categories. This is not surprising but should be interpreted carefully because it is often based on analyst estimates of large initial effects. If many expenditure categories are relatively fixed, then it is to be expected that those which are variable, bear a more than proportional adjustment. Examples include repairs and maintenance of properties, fertiliser applications and capital expenditure on farms all of which can be supported by farm survey data (from ABARE for example) and industry supply/performance data (e.g. the sharp fall in machinery sales during the mid-1980s grain 'crisis' and the large number of dealers who closed up during that period). Within the household consumption area, consumer durables, holidays and, in some cases, private schooling, are probable targets.

Third, the approach revealed large differences in the pattern of change/behaviour among firms. While this issue is still to be investigated more thoroughly, factors such as debt/equity ratios, reserve holdings, alternative income sources, family structure and life cycle stage and operating objectives all contribute to the pattern of adaptation to short-run instability. Some research correlating these factors with expenditure patterns would facilitate a more precise determination of expenditure changes and allow better forecasts of likely short-run direct and indirect effects of short-run price changes.

Fourth, there were notable differences between the effects in sugar, which is essentially a specialised monoculture, and in wheat, which is grown in a mixed farming context. Most of that appeared to be associated with a larger array of options within wheat-sheep farming than in sugar, but some additional flexibility appeared to reflect the structure of that region (Gunnedah-Tamworth), particularly the close integration of the grain, intensive livestock and livestock processing activities.

An example of production instability is provided by a case-study of drought effects on the Darling Downs region in Queensland undertaken by Powell and Saeed (1984). The problem is complex, especially in terms of changes in expenditure patterns and other

compensatory changes particularly in livestock related activities. In grain industries, these effects are less prominent but the effects through investment, savings/borrowings and consumption need to be considered. For livestock, there are additional effects through increased expenditures on inputs and there is an early drought phase increase in turnoff that stimulates several activities. Add to the above compensating price effects that will be variable but important for some industries with local markets. Powell and Saeed found that the estimated economic impacts were much less than the conventional estimates based on applying a constant multiplier to the changed value of farm output due to the positive effects related to increased costs, increased turnoff of stock and price increases for some products.

Input instability is not so common but is significant in many irrigation areas where there is low reliability in the supply of water such as in Northern N.S.W. This happens to be an area where cotton is the main crop and the expansion of the industry has made that area one of the significant growth areas in rural Australia. The nature of the instability is that all growers have a specified entitlement of water and they receive, pre-season, an indication of the proportion of that allocation that is available. That can be supplemented by any surplus flows in the river, but they are unpredictable.

In these areas, water availability is an important determinant of the size of the cotton crop. The effect overall, however, will involve consideration of potential compensating adjustments through the use of dryland crops and changing to less intensive water using crops. The industry also provides some indicators of potential strategies employed by firms in the face of that instability. Many have adapted a variety of water harvesting, storage and management strategies to supplement water allocations. There is also variation among farmers in the level of risk they are prepared to take related to growing-season rainfall.

Among policy responses, price and/or income stabilising payments are commonly used as a basis for compensating farmers for what would otherwise have been reduced gross earnings. The effectiveness of that as a regional stabiliser is clearly related to the expenditure propensities out of that income. This will be variable among firms but would be unlikely to be fully compensating in all areas of expenditure, especially that of capital, and perhaps consumption, where some depression of expectations about future earnings is likely. The effectiveness will also be related to the propensities for these expenditures to leak out of the region through imports. This tends to increase with higher incomes and increased purchases of investment goods and discretionary consumer items. In a situation

where compensation is provided for lower incomes due to reduced production volumes, similar comments to above apply in the case of expenditure effects. In respect of those effects (usually downstream) that are related to volumes of output, such compensation would provide no stabilising benefits.

From a stabilising viewpoint, these approaches are usually costly through providing assistance to all producers, whether needed or not, and presumes that the one approach is suitable to all firms. It ignores the value present in allowing individual firm owners to assess for themselves the most effective stabilising strategies. That should provide different responses within different time frames, both of which are conducive to spreading the response over time and other sectors of the economy. Some evidence of that can be seen in the cotton industry. More generally, by allowing (requiring) firms to develop their own strategies for managing instability the regional economy should benefit from:

- increased diversity of production plans, thereby spreading risk;
- a variety of potential compensating adjustments in a downturn, thereby enhancing the range of economic activity; and
- access to a variety of income and capital sources that assists in the maintenance of the region's financial balances.

An issue of particular interest is how these findings in relation to stabilisation policies would change if the support remained but was 'decoupled' from production and/or market performance. This has been discussed especially in the USA and is embodied in their trade negotiation position. That could well be a preferred policy as it might be no worse in terms of the translation of those income payments into regional expenditures, while removing some of the disincentives for farmers to prepare for and implement the kinds of compensating adjustments discussed in this paper. This issue is to be investigated further.

Some Emerging Principles and Policy Directions

On the basis of some empirical findings, some theorising and some observation, it is argued that rural regions may encounter economic instability that may have adverse outcomes in terms of efficient use of resources and the welfare of persons in those regions. Given some elements of market failure, and the reduced range of macroeconomic variables available to manage regional economies, various types of policy

intervention have been used. Because the source of instability has been identified as natural disasters or exogenous market factors for key primary product sectors, much of the stabilisation policy action has been focused on providing some type of price/income support as compensation to the affected sector. Rarely has that support been extended to indirectly affected sectors, presumably on the basis that the flow-on effects from the support programs will be sufficient.

Some evidence summarised here points to inadequacies in those stabilisation policies from a regional perspective for two broad categories of reasons. First, because of specific issues related to inter-industry linkages including:

- the likely lower expenditure elasticities out of support payments because of such factors as lowered expectations and the mix of fixed and variable expenditure commitments;
- the inability of income compensation payments to generate offsets to effects related to unstable volumes of production; and
- the lags in implementing compensating strategies that themselves tend to be stimulatory to the economy.

Second, because of the effects of those policies on the structure and operating strategies of businesses in the region whether directly or indirectly affected. By providing an institutional stabilisation policy, the recipient firms have a reduced incentive to adopt business management strategies that enable them to cope with instability. Those strategies might include diversification of products produced, of the investment portfolio and of income sources, while maintaining a preparedness and flexibility in plans to adapt quickly to exogenous and unforeseen developments. Furthermore, the policy has a tendency toward homogeneity of firm production and management strategy. Thus, a rural region with well-developed stabilisation policies will:

- tend to have less diversity among firms which themselves are more specialised (in the extreme they may be monocultural);
- do not receive the benefits of the economic activity generated by the development of those flexibility and preparedness strategies;

- experience lags in the implementation of strategies to offset the effects of the initiating instability; and
- tend to experience large 'non-marginal' adjustments when they do occur because many firms adopt similar strategies.

While the quantitative significance of all these effects are yet to be determined, reference might be made to some of the differences in farming structure, operating strategies and adjustments made in recent 'crises' among selected regions. These might include specialist grain producing, wheat-sheep and sugar regions in Australia and farming areas in the central-west of the USA. Both farmers and the regions with most flexibility and least 'stabilising' intervention appear to have coped best in recent crises.

This provides a basis for developing some principles or guidelines that might form the basis of a more effective policy for rural regions. That might include:

- (i) making firm operators responsible for determining their own individual instability management strategy;
- (ii) implementing policies that do not presume that all firms are homogeneous; a set of variants might be needed to suit various categories of firms;
- (iii) avoiding policies that effectively 'force' all firms to behave similarly, e.g. land set-asides, the sugar 'peaks' system and proportional water allocation adjustments;
- (iv) if needed, policy initiatives might provide incentives to a variety of management strategies through enhancement of management skills related to finance, investment and risk: this would seem to be preferable to incentives to particular strategies that are often favoured by taxation concessions; and
- (v) if regional expenditure is to be stimulated this might best be done directly allowing it to be carefully targetted and to take account of linkage effects to maximise local impacts; the development of regional infrastructure, broadly defined, might be a suitable target.

From that basis, the importance of heterogeneity among firms, as well as production, is recognised and encouraged. That heterogeneity of firms and management strategies itself would ultimately lead to (i) diversity in production, in investment portfolios and in income sources: in times of adversity, that would mean lessened direct impacts; (ii) a variety of potential compensating adjustments that may offset the direct impacts; and (iii) a potentially larger range of sources of finance for more business and family opportunities making the 'capital inflow' easier to achieve.

While these outcomes might take some time to achieve, they would appear to offer hope for considerable reduction in government outlays, increased effectiveness of public expenditure and improved regional economy stability.

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