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The Process of Farm Adjustment: A Critical Review

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Farm adjustment is a complex process involving decisions by farmers about a wide range of economic and non-economic factors which influence the farm business and farm family. The economics literature emphasises the importance of economic factors in the adjustment behaviour of farmers. However, the observed adjustment behaviour of farmers does not correspond very closely to that predicted by that literature. Insights from the rural sociology and psychology literature offer new perspectives on farmer behaviour which are of relevance and use to both economic researchers and policy makers concerned with farm adjustment.

1. Introduction

The process of farm adjustment is an incompletely understood succession of actions which farmers undertake. These actions encompass decisions about a myriad of economic and non-economic factors which influence the farm enterprise and farm family. The most preferred result of undertaking adjustment actions for nearly all Australian farmers is to remain farming. In popular usage, the term 'farm adjustment' is most often understood as a euphemism for farmers leaving agriculture, or for some alternative action aimed at avoiding that imminent possibility. We will adopt the following broader definition (IAC 1984, p.1)

....the numerous ways in which farmers respond to change in the economic, technical and institutional environment. It includes the way in which farmers change their use of land, labour and capital in response to such things as changes in the prices of agricultural commodities and farm inputs; opportunities for investment in agriculture and deployment of farm resources elsewhere in the economy; the availability of new farm inputs, plant and machinery and new techniques of production; alterations to marketing arrangements and access to markets; variations in climatic conditions; and changes to legal restraints on the use of farm inputs and resources.

The focus implied in the above definition is clearly on the actions taken at the individual farm level. The distinction is also made between (farm-level) adjustment and 'structural change', where the latter refers to 'longer-term and more permanent changes in the pattern of production and use of resources by industries or sectors' (IAC 1984, p.2).

From the IAC definition, it is clear that adjustment is an inevitable consequence of the continuous changes that occur in a market economy, and that adjustment is not an unusual or intermittent event but a continuous process. From a national economic efficiency viewpoint, it is important that farming becomes and remains adept at adjusting to the many sources of volatility in its environment. It is not appropriate to see farm adjustment as merely a response to unusual or aberrant events.

In fact, Australian agriculture faces continuous adjustment pressure. As the number of farm units declines, and the total economy expands, the relative importance of agriculture in the economy declines. In 1951-52, the farm sector contributed about 16 per cent of gross domestic product (GDP) and about 74 per cent of total exports, but in 1992-93 it contributed only 2.8 per cent of GDP and 20.8 per cent of total exports.

The maintenance of an efficient farm sector depends on its ability to adjust to external pressure. The physical environment facing agriculture is harsh and the economic pressure over the past 40 years has been almost unremittingly of a negative nature through declining terms of trade. Farmers must adjust to both environments in a positive way.

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Review coordinated by Deborah Peterson.

In the farm sector, this adjustment process usually involves changes in the internal structure of family farms. The heterogeneity of economic performance and adjustment behaviour of farms facing a similar external environment suggests the importance of such internal factors. The close association between the farm business and the farm household fundamentally colours the way adjustment decisions are made and the consequences of those decisions. Examples are management succession within the farm family, changes in the family structure, previous poor management decisions, and other changes in family needs or goals.

Structural adjustment in any industry imposes costs on the participants which are sometimes overlooked. Adjustment in agriculture takes place within a social context, and is accompanied by social stresses and disruptions. Recognising the social context is important to an understanding of the adjustment behaviour of farmers, and to fulfilling government objectives of an equitable sharing of the adjustment burden.

Finally, understanding farm adjustment is important because governments intervene in the adjustment process in order to facilitate change in the national interest. The divergence in adjustment outcomes between those observed and that predicted by micro-economic theory suggests that factors other than those traditionally considered by governments may have some influence on farmer adjustment behaviour. In this paper the literature on farm adjustment is reviewed and synthesised from this wider point of view. The main hypothesis is that non-economic factors impact significantly on the process of farm adjustment.

2. The Need for Adjustment

2.1 Economic Factors

Secular Movements in the Terms of Trade

There has been a long term decline in the terms of trade for agriculture (the ratio of prices received to prices paid by farmers). This index has fallen from 252 in 1951–52 to 82 in 1992–93. Over the long-term technological change has generated great increases in farm output, which coupled with the declining income elasticity of demand for most farm products result in a reduction in the real unit prices of farm products. National economic growth, which results in increases in real wages, pushes up the cost of labour relative to

other inputs, and farmers face an incentive to substitute capital for labour. The efficient exploitation of technologically-based inputs usually requires an increase in the scale of operations, which produces a further incentive to increase output, which requires the control of more resources; usually more land. These trend movements in terms of trade are never smooth and are therefore not easy to distinguish from intermittent events which may prove to be cyclical (Campbell, pp. 81–86, Kingma and Samuel).

Cyclical Movements in Commodity Prices and Input Costs

The commodity price environment faced by Australian farmers is highly volatile. Except for wool, Australia is a residual supplier in world markets, and therefore can have little influence on market price. Commodity prices are affected by a wide range of factors, including weather events in major producing countries, changes in price support and other farm policies in those countries, and changes in productivity of agriculture and related industry in those same countries. Changes in energy costs have both cyclical and trend components, and are affected by a wide range of world political and economic events. Long-term and short-term changes in commodity prices and input costs are both important for farmers. A reduction in maintenance expenditures on capital items and pasture improvement necessitated by a cyclical fall in commodity prices will result in reduced productivity and reduced income. Increases in debt necessitated by large capital expenditures or short-term 'carry-over' borrowing can lead over time to financial stress. It is important for the understanding and analysis of the adjustment process that the proximate cause (high debt servicing requirements) is distinguished from the ultimate cause of the stress (Lloyd, pp. 3–20).

Changes in Government Policy

Changes in tariff policy, deregulation of markets for farm inputs and outputs (e.g. rail freight, road transport), changes in the operation of statutory marketing authorities (e.g. the former floor price for wool); a wide range of regulations relating to aspects of farm management (e.g. use of farm chemicals); and changes in taxation policy, all affect the farm sector. The protectionist farm and trade policies of the United States (US), Japan and the European Community (EC) also have profound effects on Australian farmers (Fisher, Hughes *et al.*).

2.2 Non-economic Factors

Natural Events

Natural events such as seasonal weather variations, droughts, floods, fires, insect pests and disease, and feral animal pressures can all contribute to adjustment pressures. The impacts of natural events are often exacerbated by past or current farm management practices.

Technological Change

Technological change provides both the opportunity and the necessity to innovate in order to lower costs, improve the quality or quantity of output, or both. Much of the positive adjustment of Australian agriculture has been associated with the adoption of various technological advances (Davidson).

Changes in Family Needs and Goals

These may be related to the stages of the family life cycle and business life cycle (Weston and Cary, Barr *et al.*, Boehlje); changes in health status; changes in family structure such as marriage breakdown, which themselves may be a result of financial stress; and other factors.

Changes in Resource Characteristics

Changes in characteristics of farm resources specific to individual farms, such as land and water degradation, insect pests; re-zoning of land due to expansion of urban areas and the like have to be accommodated.

Previous Decisions

Previous management decisions may take several years to exert their influence. Typical is the purchase of land or machinery accompanied by an increase in debt. While such decisions might not lead immediately to financial stress they are more accurately identified as the ultimate source of stress than, say, a subsequent commodity price fall or drought.

Recognition of Positive Opportunities

Adjustment can also involve the recognition of positive opportunities. These include: the opportunity to expand by the purchase of land; the opportunity to alter enterprise mix in response to favourable commodity price movements; favourable weather events,

or favourable input price movements; the opportunity to sell some land as a result of re-zoning or the increased demand from hobby farmers or urban expansion; and other personal factors, such as inheritance of capital.

Stress and Adjustment

Farm families routinely cope with high levels of stress caused by the overlap and close proximity of work and family life (Rosenblatt *et al.*). Such stress is associated with, *inter alia*, the multiple and competing objectives being pursued in each sphere. Elsewhere it was found that there was little direct relationship between measures of financial position and level of stress (Cary, Cary and Weston). This illustrates the crucial point that a stressful situation is not determined simply by the evidence of external events but by one's subjective interpretation of these events. Stress is experienced when individuals perceive that their resources for dealing with the demands placed upon them are taxed or exceeded (Lazarus). Therefore, some farmers respond relatively quickly to a given set of objective financial indicators while others respond slowly. This relationship is mediated by a number of personal and attitudinal variables (Salmon).

The detection and measurement of such stress has attracted considerable attention. There are numerous objective approaches to the measurement of farm financial stress, such as equity ratios and level of net cash flow (Jolly *et al.*). Hall and Backhouse discuss two measures used by the Bureau of Agricultural Economics (BAE), 'cash margin', and 'farms at risk'. However, the accuracy of the label 'at risk' is in doubt, since BAE analysis indicated that the proportion of farms which leave agriculture in any one year was 'relatively small', and about half of those defined as 'at risk' in one year were not 'at risk' in the next. Subsequently, ABARE has recognised the necessity to take into account a wider range of financial measures and farm family characteristics in assessing financial stress (Backhouse *et al.*). In particular they noted the relevance of the farm business life cycle to the incidence of financial stress (Boehlje). Other authors have suggested a range of other financial measures such as changes in net worth, and have drawn attention to the need to measure financial stress over a period of time rather than in a given year (Lins). One of the few Australian studies on stress as experienced by farmers found high levels in response to adverse economic conditions (Foley *et al.*). Unfortunately the study did not try to associate perceived levels of stress with subsequent adjustment responses.

There is also an inevitable divergence between farmers' identification of sources of adjustment pressure and the sources which might be nominated by other observers. Farmers commonly project the responsibility for their current financial stress on to sources outside their control (Leistritz *et al.*, 1986). Thus farmers would attribute greater importance to, say, a fall in commodity price or a rise in interest rates, than to an earlier decision to increase debt in order to finance the purchase of more land or machinery.

Summary

At any one time a myriad of factors impinge on the present and expected future performance of the farm business and farm family well-being. The farm sector consists of a heterogeneous set of firms and their associated households, in varying stages of incomplete adjustment from previous decisions, simultaneously affected by a wide range of more or less volatile external events and changing internal needs and objectives. It is difficult to establish simple 'causes' of adjustment stress and action, or a clear linear model of stimulus-response in such an environment.

3. Adjustment Responses

The theoretical basis for the sequence of adjustments that financially stressed firms undertake is not well developed (Brake and Boehlje). There is a wide range of actions which can be taken in response to adjustment pressure including both on-farm and off-farm strategies. Responses can be conveniently grouped under two headings; farm related and family or household related adjustment.

An initial reaction to financial pressure is to reduce discretionary spending on farm-related and household items ('belt-tightening'). The former includes the postponement of intermittent expenditure, such as purchase of capital items and farm improvements (farm machinery, buildings, fencing). Some relatively regular expenditures might also be deferred, such as pasture improvement and maintenance of capital items. This has been called 'living off depreciation'. From a research point of view the practice is difficult to observe or verify empirically.

Farm related responses include postponement, restructuring, expansion, diversification, exit and other factors (Figure 1). The response of Australian farmers to the secular decline in their terms of trade has typically been to increase their farms' productivity, most commonly by increasing the amount of land

farmed, in conjunction with the application of land-extensive technology (Campbell). However, the acquisition of more farm land is rarely a feasible option for a farmer under immediate financial stress. Land prices are usually depressed during downturns, and farmers are generally unwilling to sell in such times. In subsequently favourable economic times, the expectations of previously stressed farmers may rise to such an extent that they have less incentive to sell land, despite the improved asset prices which follow the upturn, and eager purchasers often bid up the price of land to high levels on the basis of unrealistic expectations. Ironically, this can sow the seeds of future adjustment stress, particularly if money has been borrowed to purchase land and/or improve and equip the farm (Rathge *et al.*).

Figure 1: Summary of Farm-related Adjustment Responses

1. Postpone capital purchases.
2. Debt restructuring.
3. Cost reduction, including labour shedding.
4. Output expansion through increasing productivity of existing inputs.
5. Intensify production on existing land.
6. Change enterprise mix.
7. Diversification (i.e. into products not previously produced).
8. Intra-family change of management (usually inter-generational).
9. Buy or sell land:
 - some land
 - all land
 - including change of location, sale and lease-back, exit from farming.
10. Augmentation of human capital, including re-training for occupational change.
11. Change in off-farm employment
 - farm related,
 - non-farm related.
12. Change in other off-farm investment (e.g. invest proceeds from sale of some or all farm assets).
13. Share major capital expenditure or other productive capacity with other farmers.
14. Obtain government assistance
 - income only,
 - in conjunction with one or more of the above measures.

Sources: Brake and Boehlje, Barr *et al.*, Ekstrom *et al.* and Weston and Cary.

Figure 2 summarises farm household responses to financial stress made by a large sample of farm families in the north-central region of the US (Lasley and Fellows). The postponement of major household purchases and the use of savings to meet living expenses were the most frequently nominated adjustments. The responses of families to favourable financial circumstances will include the reverse of those shown in Figure 2.

Figure 2: Household Related Responses to Financial Stress

1. Postpone major household purchases, e.g. consumer durables, home improvements or maintenance.
2. Use savings to meet living expenses.
3. Reduce or cease contributions to savings plans.
4. Reduce expenditure on food and clothing, increase home-grown or home-made component.
5. Change transportation patterns, e.g. shop closer to home.
6. Off-farm employment of owner, spouse, or family members.
7. Decrease/postpone medical or dental care or insurance.
8. Sell private or household possessions e.g. 'trade down' private vehicle.
9. Increased use of credit.
10. Late or non-payment of bills.
11. Reduction of education expenses.
12. Borrow money from friends or relatives.
13. Liquidate off-farm assets, such as property, shares, or other financial assets.
14. Reduce other private expenditure, e.g. utilities, vacations, entertainment, charitable contributions.
15. Obtain government or non-government assistance (income, counselling, etc).

Source: Lasley and Fellows.

Reduction in the employment of non-family labour is also likely to be an early response to financial stress. The substitution of family labour for employed labour is not always possible or cost-effective, however, as there could be an opportunity cost in the form of off-farm income foregone. Working longer or harder is, however, a familiar adjustment response in most farm families and can result in increased levels of work related injury, stress related illness, and intra-family conflict. Little evidence is available on the impact of farm financial stress on the use of farm labour (Powell, Lewis).

In a longitudinal study of farmers in North Dakota, various farm adjustment strategies were identified (Ekstrom *et al.*). About 28 per cent of respondents took some action to reduce their debt over the period surveyed, by (in descending order of importance) re-negotiation of loans, sale of breeding livestock, or sale of machinery. Other strategies included postponement of capital purchases (62 per cent of respondents), reduction of tillage operations (49 per cent), reduction of family living expenses (47 per cent) and reduction of expenditure on yield-increasing inputs such as chemicals and fertilizer (27 per cent).

In a study of dairy farmers in northern Victoria it was found that very few farmers were prepared to sell their farms despite the then parlous financial situation in the industry (Salmon *et al.*). Less than two per cent of respondents planned to leave the industry. The adjustment alternatives were exclusively on-farm adjustments. Thirty-nine per cent intended to 'do nothing' (presumably, apart from various business and household 'belt-tightening' responses), while other popular alternatives were to obtain carry-on finance, and to commence or continue off-farm work. Very few thought that diversification into other enterprises or expansion of their operations was an option. The risks associated with diversification involving radical changes to the organisation of farming resources and work make it an unattractive option at a time of severe financial stress.

The wool industry in the early 1970s was facing severe economic pressures with some estimates suggesting that 80 per cent of graziers in the Pastoral Zone would be forced to quit their properties. Despite this apocalyptic scenario developed at the time of the crisis only one of the 75 wool growers interviewed subsequently moved out of agriculture (Gregory).

Adjustment strategies are increasingly including some participation in the non-farm economy. This tendency is common and long-standing in the US. Participation could include: one or more family members taking part-time or full-time work off-farm; investment in non-farm assets of various degrees of liquidity; involvement in further education or re-training; and other actions. While some of these actions are likely to be taken in response to severe short-term financial stress, others are better seen as long-term strategies aimed at adjustment over an extended period. Participation in the off-farm sector may also be seen in some instances as a series of steps leading to full exit from farming.

Off-farm income has become an important source of income for US family farmers (Leistritz *et al.*, 1987), and now accounts for about 60 per cent of their total income. Off-farm income includes both income from employment and income from off-farm investments, and may also include significant income from government programs. Part-time farming has become a permanent, institutionalised feature of US agriculture (Rogers *et al.*).

In the Australian context off-farm income has received attention from a number of authors, (Tubman; Nankivell; Robinson and McMahon; Males, Poulter and Murtough; Paul; Peterson, Dunne, Morris and Knopke; and Peterson and Moon). In a survey of dairy farmers in three regions of Australia it was found that off-farm employment was the major adjustment action taken to offset low or declining income (Nankivell). Between 40 and 67 per cent of dairy farm operators in that study engaged in either full-time or part-time off-farm employment. It was also found that the dependence on off-farm employment as a major income source was part of a series of integrated long-term adjustment plans by farm families. This included increasing the educational level of the next generation and discouraging them from becoming farmers.

In the three years to 1989–90 it was estimated that off-farm income added an average of 23 per cent to gross cash surplus per farm in broadacre agriculture, compared with 10 per cent in the three years to 1980–81 (Peterson *et al.*). Over a later period (1988–93) it was found that there was an increasing incidence of off-farm income being earned by farm families (Peterson and Moon). For family owned broadacre farms the proportion earning income off-farm increased from 26 to 34 per cent. In 1992–93 those 34 per cent earned around \$15,000 or 37 per cent of total income off-farm. Financial hardship was a major motivation for their seeking off-farm work.

4. Factors Affecting the Choice of Adjustment Action

The primary focus of much adjustment research is predicated upon the notion that adjustment actions are the responses to single identifiable events or stimuli which occur at intermittent intervals. This view is no doubt fostered by the periodic crises which beset one agricultural industry or another, accompanied by widespread publicity and community concern. In reality, the adjustment process is more complex, linked

to long-term processes of change on individual farms, and heavily influenced by a wide range of factors relating to the farm household. In Figure 3 we summarise the factors which appear to influence adjustment behaviour and the adjustment process.

Figure 3: Summary of Factors Affecting the Choice of Adjustment Action

1. The nature of the adjustment pressure and its expected duration and severity.
2. The state of the market for farm inputs (especially land) and outputs.
3. The physical and financial characteristics of the farm.
4. Demographic characteristics of the farm family.
5. The attitudes, values, and goals of the farm operator(s) and other family members.
6. The local social and economic environment.
7. The institutional environment.

Type of Adjustment Pressure

The nature of the adjustment pressure fundamentally colours the view of the farm family about the appropriate level of response. For example, a cyclical downturn or upturn in commodity prices might not induce as fundamental a change in management as would changes in commodity prices which are expected to be sustained, or as would changes in family composition or circumstances.

Markets for Farm Inputs

The market for land sometimes operates in ways which inhibit desirable adjustment. During downturns in agriculture when pressures for exit from the industry are greatest, buyers are few, because they lack sufficient funds and form pessimistic expectations, while potential sellers are disinclined to sell their only productive asset on a depressed market. In some locations no buyers exist at anything but giveaway prices. Given this scenario those farmers who may wish to leave are 'locked in' as the price of their main asset (the family farm) is severely reduced in value. The performance of finance markets is also central to the effectiveness of farm adjustment. Significant imperfections or failures in these markets could impeded appropriate responses. Indeed such alleged imperfections have been used as a justification

for government assistance to farmers under financial stress. Since the deregulation of finance markets in the mid-1980s this justification is less convincing, but deregulation has itself added to the volatility of interest rates and exchange rates, which can contribute to financial stress.

The Physical and Financial Characteristics of the Farm

These also have an influence on the choice of adjustment action. These include: its size; technological characteristics such as the age and productivity of improvements; human resources available to the farm; income, debt, and equity positions; the form of land tenure; and the existing enterprise mix.

The role of the economic characteristics of both farms and their external environments is paramount in the explanations of adjustment behaviour found in the mainstream agricultural economics literature. For example, Bowen and Poulter explained the responses of Australia's wheat growers to price falls in terms of conventional economic variables. By contrast, these variables apparently do not offer adequate explanations for the rate of exit of farmers from farming, which is a decision likely to be influenced by a range of family, social, and cultural factors.

Demographic Characteristics

The demographic characteristics of the farm family have a fundamental influence on their adjustment behaviour. These include the composition of the family in terms of the number of people and their relationship to each other, their age, sex, health, education and work experience. At different stages of the family life-cycle, there are different demands on the farm business in terms of income generation and security of assets, as well as different levels of availability of family labour resources and potential for off-farm income.

In view of its importance as perhaps the most common form of farm adjustment in Australia, there is remarkably little literature on inter-generational transfer in an adjustment context. The transfer of ownership to the next generation can be an opportunity to effect management improvements, based on a higher quality of human capital, which would improve adjustment performance. Some farmers see the education of their children, who, it is often assumed, will eventually enter the farm business, as more important in this

regard than their own education. Estate planning and asset transfer by farmers are however, often undertaken with minimal communication between the generations, and with inadequate input from relevant professionals (Blunden *et al.*)

The literature on the nature of the stress involved in the process of transferring the farm business from one generation to the next is extensive (Russell *et al.*). The complex inter-relationships between family, household, and business which characterise farming are now recognised (Gasson *et al.*, pp.21-25).

This thorough review of the family dimension of farm business behaviour drew on the literature in disciplines such as industrial economics, social anthropology, history, and rural sociology, as well as agricultural economics (Gasson *et al.*). British writers have attempted to develop relevant socio-economic frameworks for understanding the roles of such factors as the family development cycle, processes of inheritance and succession, roles of women in farm families, and multiple-job farming families. These issues are relevant to the farm adjustment process in Australia as well, although the emphasis and empirical findings reflect the specific characteristics of British agriculture.

Attitudes, Values and Goals

The attitudes, values and goals of farmers are important influences on the kinds of adjustment decisions farmers make, their management of the adjustment process, and their beliefs about the outcomes of that process. Farmers have both business and personal goals, and the close relationship between the farm household and the farm business ensures that they affect each other in many ways.

The economic theory which is implicit in much of the literature on farm adjustment, and which underpins most adjustment policy and programs, treats motivation (goals) as a given, and explains variation in behaviour in terms of availability of resources and market conditions. Specifically, behaviour is assumed to be driven by rather narrowly defined economic goals. However this theory leaves much of farmers' behaviour unexplained. A theoretical framework for the discussion of the role of goals and values in farmer behaviour, classifies values (which precede and regulate goals) as either instrumental (farming as a means of obtaining income and security), expressive (farming as a means of self-expression and personal

fulfilment), intrinsic (farming as an activity in its own right), or social (farming for the sake of interpersonal relationships in work) (Gasson). The relative ordering of these values is hypothesized to influence farmers' decisions in situations of choice. Pilot studies suggested that the British farmers surveyed had a predominantly intrinsic orientation to work, valuing the way of life, independence, and performance of work tasks above the other aspects of their occupations. The value orientations of larger and smaller farmers were compared. One of the study's implications was that (Gasson, p.535):

...farm adjustment schemes which offer (farmers) modest financial incentives to give up their present, highly valued way of life cannot be expected to arouse much response if many of those eligible are less concerned with maximising income than with making a satisfactory living in order to pursue pleasurable activities and be their own master.

The divergence of farmer's behaviour away from profit maximisation has been discussed in a farm management context (Boehlje and Eidman, pp. 6-9). They discussed nine possible goals and the relationship between them. While conventional maximisation of profit or return on assets is one of these, and may well be the dominant objective under certain circumstances, the observed adjustment behaviour of many farmers indicates that other objectives come into play at crucial times, perhaps most evidently when the farm business is under severe stress. Farmers' attachments to the land they own, and their attitudes towards the intrinsic rewards of farming as a way of life appear to be important in explaining a lower than expected rate of off-farm migration in times of severe financial stress. Just as importantly, the desire to own more land in order to give their children the opportunity to pursue these intrinsic goals appears to influence decisions to expand in more favourable times. Ironically, this very action can threaten the long-term viability of the enlarged business, just as it can in the non-farm sector.

In an Australian context, Kingma and Samuel (p. 206) suggest that '...the benefits that users derive from farm resources may not only be monetary and that non-monetary benefits may accrue to farmers by way of lifestyle considerations.' On this point, Musgrave (p.250) states:

...non-cash benefits gain particular significance in the case of those farmers who stay on in farming despite every (financial) indication that they would be better off out of the industry. For many such people the higher cash benefits outside agriculture are no compensation for the loss of lifestyle that is involved.

Differences between the adjustment behaviours of farms facing a similar external environment are indicative of the importance of internal factors in the explanation of adjustment.

In a survey of wheat-sheep farmers in Western Australia, Gasson's classification of value orientations was used to investigate the relationships of these orientations to farm performance variables and the personal characteristics of the farmers (Kerridge). It was found (as it was by Gasson) that farmers on larger farms tended to express instrumental values, while those on smaller farms tended to express intrinsic values. Other factors investigated were debt levels, age, education, and farm income. The study also found that older farmers tended to hold intrinsic values, while younger farmers expressed instrumental values. This has policy implications given that a significant proportion of Australian farmers are old and are thus less likely to be attracted by the financial incentives of adjustment programs aimed at exiting agriculture.

Attitudes and therefore goals are, however, at least partly learned. In a study of Queensland graziers, it was found that those with experience of successful past expansion had different goals and preferred responses than those without such experience (Cary and Holmes).

Some of the attitudinal, social and cultural factors which appear to influence the reluctance of Australian farmers to quit farming, in the face of strong economic pressures include the independence of self-employment; the family farming tradition; the identity, prestige, self-esteem and pride that farming affords; the strength of local community networks; age; and educational qualifications (Bell and Pandey). A survey of wool-growers in Queensland tended 'to confirm the influence of non-monetary factors in the occupational and life-style decisions' of farmers (Riethmuller).

The Local Economic and Social Environment

The local social and economic environment includes the nature of relationships between farming and the local community; the community response to adjustment stress; employment opportunities in the local community; and support services.

The spatial distribution of farms relative to the location of alternative employment is likely to help explain the incidence of off-farm work as an adjustment response. In this context it is noted that a relatively high proportion of US farmers live close enough to non-farm employment sources to make such employment feasible. For many Australian farmers, off-farm work means working on other farms, for example as contract machinery operators or shearers, and in other tasks (Males *et al.*). This factor is likely to affect farmers' perceptions of the relative attractiveness of different adjustment options.

Several studies have examined the role of information in the adjustment behaviour of farmers. It has been suggested that providing farmers with more information on their individual circumstances and options is a crucial contributing factor to the adjustment decision and process by individuals (Salmon). In a study of the re-settlement process of displaced farm families in South Australia considerable importance was attached to the sources of information and advice used at various stages in the process in determining adjustment behaviour (Bryant).

The Institutional Environment

The institutional environment is broadly defined to include the legal framework; Local, State and Commonwealth Government programs of assistance or other intervention in the adjustment process, including information and extension services; and the political environment.

The literature on the role of government in the farm adjustment process addresses the justification for government intervention, its efficiency and effectiveness, and various administrative aspects (Coopers and Lybrand; IAC 1976, 1984; Kingma, Easter and Hall; Kingma and Samuel; Lloyd; Musgrave, and Synapse). We are interested in the extent to which the existence and management of government programs affects adjustment decisions, processes and outcomes, with our primary focus being at the farm level.

There are a large number of government activities which have some influence on adjustment behaviour at the farm level. Some of these are explicitly directed towards the adjustment process, while the others are primarily directed at other issues but have an incidental impact on adjustment. For example, while the application of an assets test on eligibility for certain social security benefits is primarily aimed at achieving equitable access to such benefits across the whole community, it may have incidental impacts on the attractiveness of adjustment options for farmers. Regional development policies can alter the capacity for rural towns to offer off-farm employment opportunities.

The most obvious vehicle for government influence on the farm adjustment process is the Rural Adjustment Scheme (RAS). Over the years this package of measures has included a variety of specific schemes, but broadly it has had both 'assistance' components and 'adjustment' components.

The 'assistance' components have had the purpose of assisting farmers who were judged to be 'viable' in the long-term to withstand short-term financial stresses which might otherwise have led to their exit from the industry. Since 1993, this assistance has been redirected somewhat away from farmers at this margin of viability and towards those who are attempting to effect and are deemed capable of effecting substantial improvements in productivity. The justification for assistance has rested largely on alleged imperfections in the markets for farm finance, which might have the effect of forcing the premature exit of otherwise productive farmers. While the rationale and effectiveness of successive versions of the Scheme have been the subject of continuing debate (Davenport *et al.*), it is clear that in the past decade at least these parts of the Scheme have been used largely as 'carry-on' assistance for farmers who were deemed to be marginal by the banking sector.

The 'adjustment' components include income assistance for farmers considering exit from the industry and cash re-establishment grants for those who do actually exit. It has also included measures aimed at augmenting the land market by facilitating the build-up of properties to a viable size, but these have been relatively little used.

Since the deregulation of financial markets in the mid-1980s, it has become more difficult to sustain a justification for continuing government intervention of the 'assistance' type, but alternative rationales from

time to time have gained sufficient political support to be transformed into policies to deal with acute pressures, for example those resulting from drought and the collapse of wool prices.

The enunciation of Commonwealth Government policy on farm adjustment has recently claimed an 'integrated approach' incorporating not only the RAS, but National Drought Policy, financial instruments for income smoothing such as Income Equalisation Deposits and Farm Management Bonds, Landcare, and broader economic and regional development strategies. While this implies a welcome broadening of the perspective of policy makers on the sources of adjustment stress and the process of adjustment, the extent to which the policies are truly integrated, and the appropriateness of the policy directions implied, have been questioned (Davenport *et al.*).

This review has described farm adjustment as a process which is influenced by a wide range of factors that go well beyond any problems of short-term access to finance markets. It may well be that the overall efficiency and equity of farm adjustment as a long-term process are more dependent on a range of decisions that are made over the course of the farm family life-cycle, which is closely entwined with the farm business life-cycle (Stayner). Farm families and businesses interact with various institutional environments at critical points in these life-cycles.

For example, decisions regarding career choice for the younger generation of farm families intersect with the education system. If that generation sees a wider range of occupational choice then this may reduce the perceived pressure on them and their families to seek and provide a career within farming, which can result in imprudent means and timing of expansion decisions. The process of entry into an existing family farm business, the transfer of ownership and management, the provision for retirement of the senior generation, and the distribution of estates, intersect with a number of institutional arrangements concerning stamp duty, asset and income tests for aged pensioners, and continuing fears about a possible reintroduction of inheritance taxes, among others.

A more comprehensive assessment of the ways in which the adjustment process is affected by the wider range of factors identified in this review, would seem to be desirable. An important part of such an assessment would be a consideration of the potential role of government in facilitating this broadly defined adjustment process, consistent with its stated policy objectives.

5. Conclusion

Farm adjustment is not an occasional response to intermittent acute pressure, but encompasses continual responses to both long-term and acute pressures which are both external and internal to the farm family and business. In this paper the focus has been on the farm family as crucial participants in the farm adjustment process. This contrasts with the simplistic behavioural assumptions which dominate the economic analysis of the adjustment process, which in turn appears to shape adjustment policy and programs. It seems to us that the extraordinary heterogeneity of human situations in farming, such as family composition, goals, values, capacities, histories, life-cycle characteristics, linkages with community, and so on, have an important influence on the adjustment process.

The predominant micro-economic model for understanding and predicting farmer behaviour is based on behavioural assumptions relating to economic rationality which are clearly inadequate in the case of family farm businesses. Furthermore, while aggregate statistics are available which describe the net outcomes of a myriad of adjustment actions on the nation's farms, very little is known about what happens on the individual farms on which adjustment takes place; that is, about how the adjustment process unfolds over time on individual farms.

The difficulty of drawing boundaries in time around adjustment phenomena suggests that, ideally, adjustment research should allow for the influence of events and actions which might have occurred a considerable time prior to a period of acute adjustment stress. These prior events can have a significant influence on the type and effectiveness of current adjustment behaviour. It can also take a long time for adjustment pressure to generate responses at the farm level.

It would seem that farm adjustment research ought to be paying more explicit attention to the modelling of the integration of on-farm and off-farm economic activities. It is difficult to see how the conventional approach to modelling the farm business which incorporates only on-farm enterprises and options could adequately explain the responses of farm families to adjustment pressures.

In view of the interpenetration of business and family goals on Australian farms, adjustment research also needs to pay more explicit attention to the influence of the family and business life-cycles on adjustment behaviour. These factors can influence business

goals, attitudes to risk, and the range of options which are contemplated, and can therefore help to explain the choice of certain actions. Of particular importance would appear to be the kind of adjustment behaviour which is undertaken in relation to inter-generational succession of management and ownership of the farm business. Research needs to pay more explicit attention to the characteristics of farms as *family businesses*, since such businesses present a particular set of issues that are not considered in the mainstream economic literature (Robbins and Wallace). Practitioners are beginning to recognise these issues more explicitly.

In summary, then, this review points towards the need for a more 'holistic' modelling of the farm adjustment process, in which the obvious economic imperatives of the farm as a business are integrated with the reality of the farm family as a social unit.

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