THE USE OF RELEVANT COST ANALYSIS TO ASSESS PRODUCTION VIABILITY FOLLOWING THE DECOUPLING OF SUPPORT PAYMENTS IN ENGLAND[1]

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Abstract

Relevant cost analysis is a well recognised technique in management accounting used to decide whether production is viable in the short run. The removal of production-related subsidies following the reform of the CAP has left many farm enterprises with net margins that show a substantial loss. Relevant cost analysis is used to determine whether nevertheless it remains worthwhile continuing to produce in the short run. Relevant margins were calculated from industry costings for combinable crop, beef and sheep enterprises for 2004/5. These show that costed on this basis it is only the beef enterprises that look financially unviable. The paper argues that relevant cost analysis not only provides a very useful aid to farm level decision-making but also represents a very useful tool for guiding policy makers and industry analysts on the vulnerability of production and the potential for resultant structural changes.

Keywords: relevant cost; viability; decoupling; subsidies; production

What is Relevant Cost Analysis?

Relevant cost analysis is a well established method in management accounting used to assess the viability of production decisions. Although it has not been widely used in agriculture as such, it uses virtually the same principles as those applied in partial budgeting. It is therefore a concept that will be both easy to appreciate and to apply for farm management economists. Partial budgeting isolates costs and revenues that are relevant to a change which is taking place. This generally involves a factor or product substitution. Relevant cost analysis typically looks at the decision to produce for a particular enterprise in isolation. Both techniques seek to isolate costs and revenues that are relevant to the production decision being examined ignoring those that are deemed to be irrelevant.

Drury (2004, p.37) defines relevant costs and revenues as 'those future costs and revenues that will be changed by a decision, whereas irrelevant costs and revenues are those that will be not be affected by a decision'. This generally restricts consideration to cash costs because these are the ones that alter. Drury concludes that 'future cash flows' tend to be 'the relevant financial inputs for decision-making purposes'. However it is worth pointing out that if there is an opportunity cost this could put a cash value on the release of a resource priced on a non-cash notional basis.

Irrelevant costs according to Jay (2004) include:
Fixed overheads – because these will be incurred regardless of the decision.
Notional costs - as these costs are only a book exercise and do not represent a real cash flow.
Past or sunk costs – because these have already been incurred and they cannot be affected by a future decision.
Book values – i.e. the price paid for stock in the past.

[1] Some of the analysis in this paper has already been presented, with the permission of the 16th International Farm Management Congress organisers as an unrefereed paper (Jones, 2007) to the RICS Rural Research ROOTS 2007 Conference, 17th April 2007.

The Case for Considering the use of Relevant Margins as Opposed to Gross or Net Margins

In a sense it may sound as though the definition of relevant costs is very similar to the definition of variable costs which are the basis of gross margins. However the identification of variable costs tends to be exclusive to those that can be easily allocated to enterprises. Costs which do vary, in the sense that they are affected by whether production takes place or not, which are nevertheless hard to allocate, tend to be treated as 'fixed'. A good example of this is machinery costs. The elements that are directly affected by machinery use i.e. fuel and repairs, tend to be treated as part of fixed cost along with other elements, such as depreciation, insurance and road fund licences, which can to an extent be regarded as a fixed regardless of the use of the machine. In a relevant cost analysis all items that vary must be identified separately. This may involve a certain amount of estimation or apportionment. But no attempt needs to be made to allocate costs that are irrelevant to the decision to produce.

There has been a long-running debate amongst farm management economists about whether net margins should not be more widely used as an alternative to gross margins in order to recognise the importance of the 'fixed cost' implications of enterprise choice (Warren, 1998). The case for this was put by Giles (1986 and 1987) and to an extent refuted by Kerr (1988). Nevertheless the net margin approach is now being more widely adopted and the arguments for doing so are set out in case for using net margins in the Farm Business Survey (FBS) as put by Wilson and Seabrook (2005).

One of the objections to net margins as a measure of enterprise profitability is that there is no defined limit on which costs can and should be allocated. As a result the size of a net margin may be as much a reflection of the ability to allocate costs as to the amount of them. It is also a moot point as to whether the costs really can be allocated fairly to the enterprise. Relevant costs analysis provides a clear definition as to what costs should be allocated and why. This of course means that some of the costs that are deemed irrelevant are nevertheless real costs that have to paid somehow or other. But taking irrelevant costs out of the picture is helpful in identifying what could be a perfectly sound rationale for continuing to produce even when the net margin may indicate a substantial loss.

A good illustration of why a distinction between relevant and irrelevant costs is a useful one is the cost of land and buildings. In the short run these costs will have to be met whether production takes place or not because of contracts with landlords, mortgage providers etc. Opportunities to buy or rent land are scarce and farmers will not give land up just because prices are unfavourable for production for the time being. To these practical considerations is added the need to retain land in order to claim the Single Farm Payment (SFP), which is area based. If the SFP is more than the costs of rent or finance associated with the land then getting rid of the land would be counter-productive. Yet net margins generally allocate the costs of land as though they were attributable to the enterprise and nothing else. Relevant cost analysis ignores these costs as fixed and would include consideration of any revenues that were lost as a result of getting rid of the land as 'relevant'.

It is quite likely that relevant costs will be different in the long run from the short run. This is because in the long run the farmer can change costs that it would be inadvisable or impractical to change in the short run i.e. staff can be made redundant, machinery sold, land can be sold or let etc. However long run relevant margins are likely to be much more difficult or tenuous to determine than short run.

Why is it Particularly Pertinent to Consider the use of Relevant Margins at the Present Time?

The importance of assessing the short run relevant margin is that if this not positive then the farmer has no financial justification for continuing to produce other than challenging the assumptions on which the calculations are based or taking into consideration potential tax advantages. There are of course plenty of non-financial criteria that could be applied to continuing to produce with a negative relevant margin but

they may not be sustainable in the long run. The relevant margin indicates the degree safety with which it can be assumed that production should continue.

It has been argued by Jones (2005) that the reform of the Common Agricultural Policy (CAP) and sharp increases in some factor costs (notably those related to the price of crude oil) has now made it quite pertinent to assess whether production should continue whereas previously this might have been rather academic. The new context for production decision-making and the case for using relevant cost accounting have been explored more fully by Jack and Jones (2006). They argue that there are other factors which have created a case of need including, with the rapid increase in agri-environment funding, situations in which production decisions have to factor in the possibility of payments for cutting down production in order to benefit the environment and wildlife.

There is real concern currently that some sectors of agriculture cannot produce adequate returns to support their continued existence in the longer term. The latest set of figures for beef and sheep costings from the English Beef and Lamb Executive (EBLEX, 2006) are the first to show performance without the benefit of subsidy. They show losses at the net margin level (particularly after adding in notional rent and unpaid labour) across all enterprises at all levels of performance. These losses are particularly large for beef enterprises. Gross margins however at average levels of performance were all positive.

This situation is not unique to the beef and sheep sectors. Recent special studies of FBS cereal and oilseed rape net margins (Newcastle University, 2006 and Lang and Allin, 2006) also indicate that net margins would be negative without the Arable Area Payment (AAP) although gross margins would be positive. This creates a confusing picture with gross margins indicating that all these enterprises could be profitable and net margins indicating that none of them are. Relevant margins provide the opportunity to determine whether, between these two extremes, there is a good rationale to continue with production under these conditions and how generous the margin is.

Combinable Crops

The FBS studies provided a break down of the full net margin costs of oilseed rape (Newcastle University, 2006) and cereals (Lang and Allin, 2006) for the harvest year 2004. This was the last year before the Arable Area Payment (AAP) was replaced by the decoupled Single Farm Payment (SFP). It is therefore possible to see what the margins looked like with and without the subsidy.

In order to establish an estimate of the relevant margin under these conditions certain assumptions had to be made about which costs were to be treated as relevant costs. These costs are identified in Table 2 under the cost headings used in the special studies (Newcastle University, 2006 and Lang and Allin, 2006). The variable costs are all obviously relevant costs because they are totally linked to production. The ‘overheads’ were not identified in any detail. They were thus treated as common costs and therefore most likely to be fixed and unaffected by a marginal change in production. The ‘fixed costs’ were largely treated as fixed and therefore irrelevant to any short run marginal change in the cropping unless it was felt from their description that they might have elements that would vary directly with production.

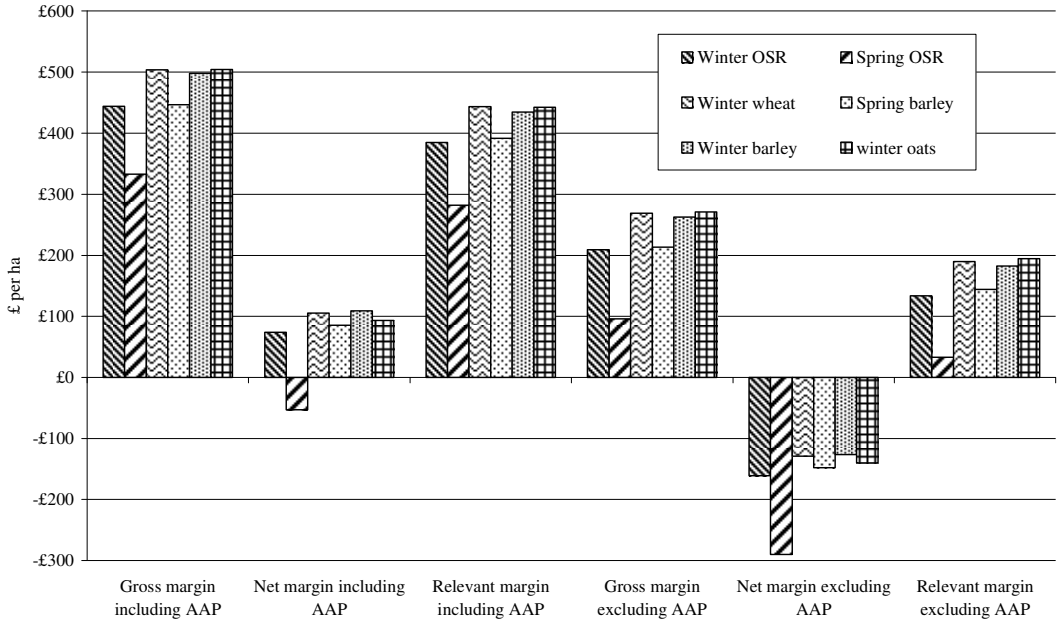
Table 2: The identification of relevant costs for growing combinable crops

Relevant costs	Costs treated as 'irrelevant'
Variable costs	**Fixed costs**
Seed	Farmer's own labour
Fertiliser	Unpaid labour
Sprays	Paid labour - ordinary hours
Casual labour	Machinery costs - depreciation, insurance & licences
Contract	Grain storage plant - depreciation
Fuel for drying	Grain storage buildings repairs and depreciation
Marketing costs	Rent
Miscellaneous	Drainage charges
Fixed costs	**Overheads**
Paid labour - overtime	Labour
Machinery costs - fuel and repairs	Machinery
Grain storage plant - repairs	Buildings
	General

The overtime element of paid labour was considered to be a relevant cost. This was estimated at 27.6% of the total on the basis of typical annual labour cost assumptions in Nix (2006, p.133). Machinery repairs, fuel and oil were estimated at 50% of total machinery costs as an approximation based on actual proportion that these costs represented on FBS cereal farms in 2004/5 (DEFRA, 2006, Table 1). The relevant costs also included a cost of interest on working capital (not mentioned in Table 2). The annual average working capital was estimated at 66.7% of total relevant costs for autumn sown crops and 50% for spring sown. The interest rate used was 7.5%.

The crop gross margins and net margins from the FBS special studies and the relevant margins derived from them are shown in Figure 1. These are shown both with and without the AAP. It can be seen that with the AAP the crops all make a positive net margin, with the exception of spring oilseed rape which makes a small loss. There is therefore little need to look at the relevant margin to determine whether production is viable. However without the AAP the situation is much less clear. The crops all still make a positive gross margin but the net margins all show a loss of in excess of £100/hectare. Under these circumstances it is important to assess whether the relevant margin is sufficient to make it worthwhile continuing in production. The results show that it is viable, albeit with a very small margin for spring oilseed rape.

Figure 1: Gross margins, net margins and relevant margins of combinable crops in 2004/5 with and without the Arable Area Payment



Source: Based on data contained in Newcastle University (2006) Table 3.1 and Lang and Allin (2006) Tables 4.1 and

Beef and Sheep

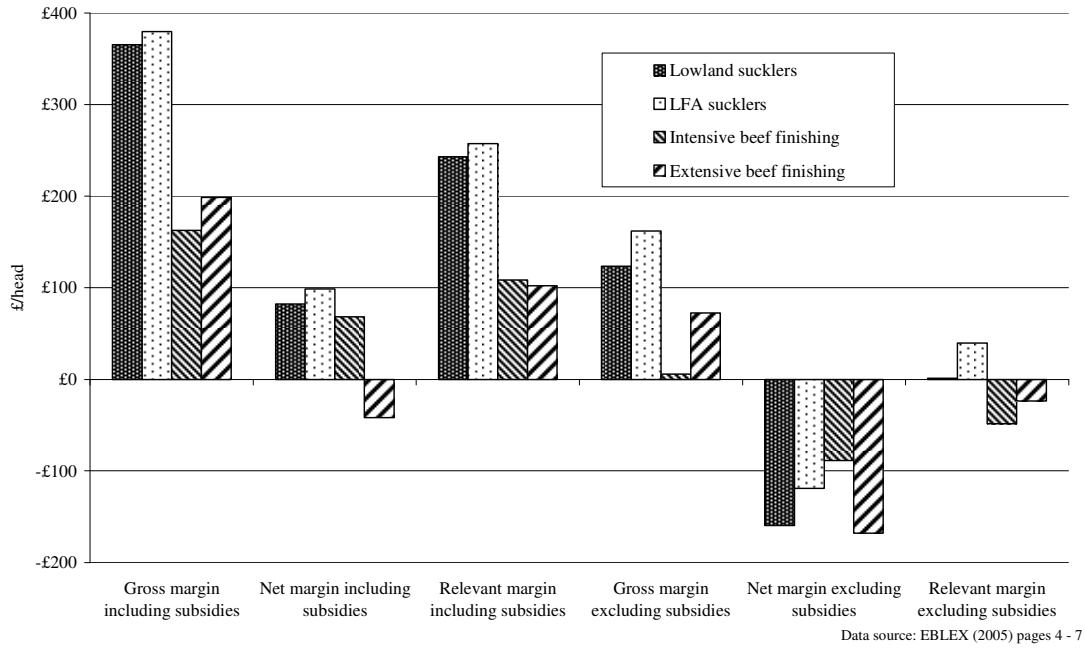
The data used to analyse production viability of beef and sheep enterprises was sourced from the EBLEX costings for 2004/5 (EBLEX, 2005). Although more recent costings are available (EBLEX, 2006) this was the last year before beef and sheep headage payments were abandoned in favour of the decoupled SFP. It therefore makes it possible to show what the returns were both with and without the subsidy.

The EBLEX definition of net margin includes different costs from those allowed for in the FBS combinable crop special studies. They do not include any imputed rent or family labour costs, whereas Newcastle University (2006) and Lang and Allin (2006) do. However the arable studies do not include finance costs whereas EBLEX (2005) have included them. This illustrates the problems caused by a lack of a common basis for net margins referred to earlier.

Relevant costs had to be extracted from the EBLEX figures by estimation. 'Labour costs' included regular wages, contract labour and casual labour. It was decided to take just the estimate of overtime cost on the whole at 27.6% (based on Nix, 2005, p.133) on the assumption that regular labour was likely to be the largest component of these costs. 'Power and machinery' consisted of machinery repairs, fuel, electricity, general contract, machinery hire, tax and insurance. It was assumed that 92.3% were relevant costs based on average tractor running cost assumptions in Nix (2005, p.165). 'Administration costs' comprised insurance, office costs and miscellaneous sundries. An estimate of 25% was placed on the likely proportion of relevant costs. 'Property charges' included water, council tax and farm and property repairs. The most important relevant cost within this would be metered water and it was assumed that this would comprise 20%. 'Land resource costs' were made up of actual rents and this is not a relevant cost so they were not included. 'Machinery and fixtures' comprised machinery depreciation, fixtures depreciation, machinery and equipment leasing. None of these are relevant costs. Finally the 'finance costs' were removed and replaced with a figure based on the relevant cost of interest (at 7.5%) on average working capital. The latter was calculated by taking costs incurred throughout the production cycle and adding half the costs incurred during the cycle adjusting the figures to an annualised basis.

The gross margins, net margins and relevant margins for various beef enterprises are shown in Figure 2. It can be seen that extensive beef finishing was not making a positive net margin even with the subsidy payments. However the other beef systems were making a positive net margin and costed on a relevant cost basis all the enterprises make a margin of over £100/head. However without the subsidies the picture is very different. Intensive beef finishing makes a tiny gross margin and all the systems show a loss on a net margin basis. It should be noted that the costs make no allowance for unpaid family labour (unlike the FBS special studies). If this was included the results would be even more dramatic. The relevant margins show a positive return, albeit a small one, for suckler cows and a negative return for both extensive and intensive beef finishing. This indicates a position which is not financially sustainable in the long term.

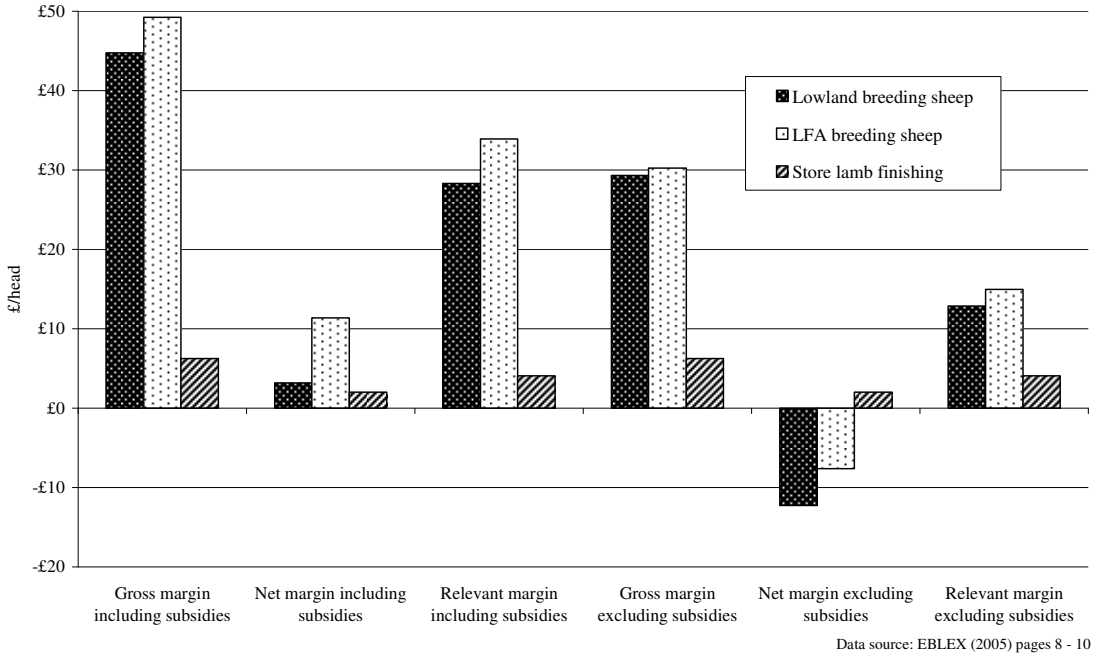
Figure 2: Gross margins, net margins and relevant margins for beef enterprises in 2004/5 with and without subsidies



Data source: EBLEX (2005) pages 4 - 7

The gross margins, net margins and relevant margins for breeding sheep and store lamb finishing are shown in Figure 3. This shows that positive net margins were being made with the benefit of the Sheep Annual Premium (SAP). Removal of that subsidy has no effect on the store lamb finishing (ceteris paribus). However breeding sheep net margins become negative. This raises the question as to whether breeding sheep are financially sustainable without the subsidy? The answer however, as contained in the relevant margins, is positive with margins on average performance of over £10/ewe. This indicates that at least in the short run the producer should remain in production and contrasts with the beef relevant margins which did not provide this comfort.

Figure 3: Gross margins, net margins and relevant margins for sheep enterprises in 2004/5 with and without subsidy



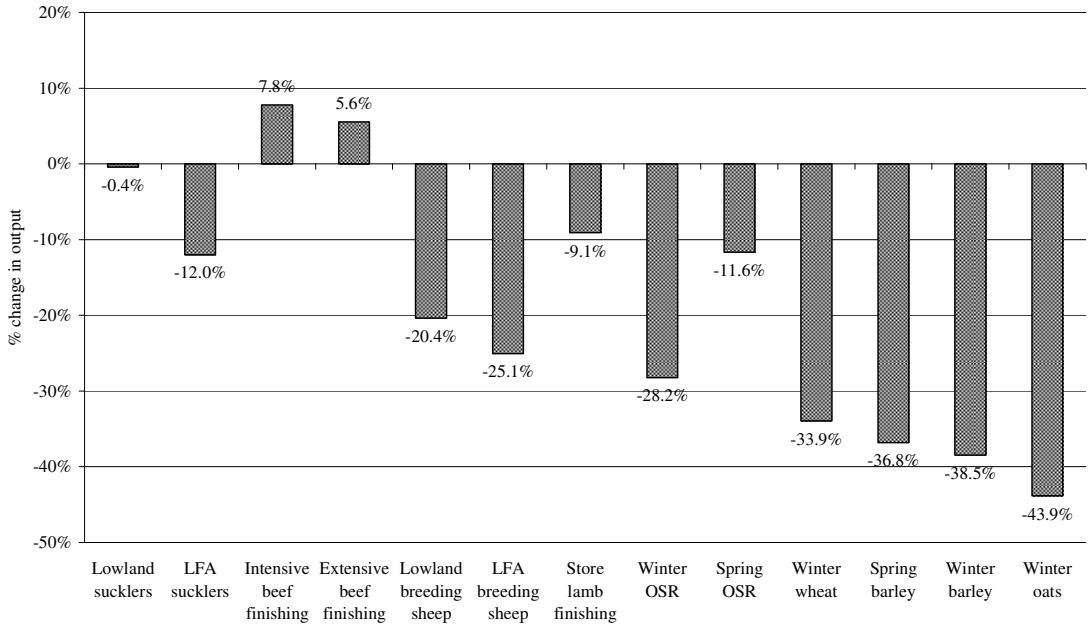
Data source: EBLEX (2005) pages 8 - 10

Sensitivity of the Relevant Margin to Changes in Output

It is useful to test the sensitivity of the relevant margins to changes in assumptions on price or physical performance. This is to show the degree of vulnerability or comfort enjoyed by the high and low performers and what an alteration in prices might do. This is particularly important as studies predict some price increases in response to subsidy decoupling (Moss et. al., 2002). It is the sensitivity to the change in the primary product that is felt to be the most significant and interesting. Therefore income from secondary products (wool with the sheep and straw with the cereal enterprises) have been assumed to be fixed.

The percentage change required in the output of the primary product for the relevant margin (without subsidies) to break-even point is shown Figure 4.. This shows that most of the arable crops would require a substantial reduction in yield and/or price for the relevant margin to be at the break-even level. The sheep enterprises are closer to the break-even but the change required in lamb output (i.e. due to price, lamb numbers or weight) would still be quite substantial. But the beef suckers are close to beak-even and very exposed to any reduction in output (particularly in the lowlands) and the fattening systems require an increase in output (from the price or weight of the fat animal or a reduction in the store price) just to reach the break-even point.

Figure 4: Percentage change in primary output required for the relevant margin to break-even



Source: Based on data contained in EBLEX (2005), Newcastle University (2006) Table 3.1 and Lang and Allin (2006) Tables 4.1 and 4

Beef results for 2005/6 (EBLEX, 2006) show that intensive finishers have increased their margins as a result of a drop in the price they pay for stores. But in general terms the picture does not look any more favourable than in 2004/5. Output has dropped for suckler cows although there has been a small improvement in the gross margin for lowland sucklers. EBLEX (2006, p.7 – 8) now show a net margin for lowland sucklers after having deducted notional costs for unpaid family labour and land at a loss of £351/cow and a loss of £425/cow in the Less Favoured Area (LFA).

Conclusions

Relevant margins provide a very useful way of assessing whether enterprises that show a loss at the net margin level are nevertheless viable in the short term. The use of actual figures and assumptions on what are likely to be the relevant cost elements illustrate the use and the value of the technique. It shows that without production subsidies on average all combinable crop, beef and sheep enterprises in 2004/5 looked unprofitable at the net margin level. But by removing irrelevant costs it showed that only the beef enterprises looked to be financially unviable in the short run. This kind of analysis is clearly very valuable to farmers trying to make tactical production decisions and strategic plans for the future. It also could be a valuable tool in informing policy makers and industry analysts about the vulnerability of individual enterprises and production systems.

The relevant margin will vary on each farm according to circumstances. Those that have the most flexible and responsive cost structures will have the lowest margins and those whose costs are mostly fixed and/or notional will have the highest for a given level of output. This does not indicate that their businesses are more profitable overall; in fact they may well be less profitable. However it does show that in terms of production decision-making they are likely to continue in production at lower prices and output levels than those whose costs are less fixed. This helps to explain the resilience of the self-sufficient family farmer remaining in production when on a total cost basis the enterprise looks to be financially unviable.

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