

RELEVANT COSTING: CAN THE METHOD COINCIDE WITH DIFFERENT INDUSTRIES?

Nabila Nisha*

Abstract *In management accounting, relevant costing is a well-known method used to assess the feasibility of production decisions in the short-run. It can be applied to a number of specific decisions in various types of industries namely manufacturing, service, and not-for-profit organisations. However, this concept has not been widely used in agriculture. This paper reviews a case for using relevant costing approaches in agriculture and how this accounting concept can be applied to other organisational contexts. Relevant costing has been proposed to be more useful in agriculture as opposed to the traditional methods of cost analysis commonly used by the farms. Applications of relevant costing techniques in agriculture have been critically analysed arguing that the nature of agricultural business and the assumptions of relevant costing do not really coincide. This makes the concept inappropriate for use in agriculture to a large extent. The paper further tries to assess cases with appropriate examples for different organisations where relevant costing techniques can be applied.*

Keyword: *Relevant Costing, Agriculture, Decision-Making, Break-Even Analysis, Management Accounting*

BACKGROUND

Jack and Jones (2007) argue that there have been significant changes in agriculture like the removal of production-related subsidies and other subsequent changes in the structures of cost and payments of the farm businesses. This signifies a major reason why agriculture and farm businesses should opt for alternative accounting practices like relevant costing rather than the traditional gross margin system.

Since 1950s, the conventional method of costing used in agriculture is the gross margin system. Here, direct costs are apportioned to produce gross margin for farms while all other costs are classified as fixed costs (Jack & Jones, 2007). The key method here is to average out fixed costs by increasing the scale of production in order to achieve profit maximisation by the farms (Defra, 2010). This practice received support in agriculture due to the profound pressure of agricultural policies, wherein direct payments for production activities and artificial support for market prices play a substantial role (Jack & Jones, 2007).

After a futile attempt in the 1970s of introducing net margins, a significant change occurred in agriculture when the UK Farm Business Survey decided to use the net margin system by allocating costs on an enterprise basis (Dugdale, Jones, & Green, 2006). This method was undertaken due to the need for an improved accounting practice in agriculture as a result of the changing times. Although this approach allows a further consideration of costs, it does not specify the short-run and long-run marginal costs or how much fixed the costs are. Jack and Jones (2007) thus argue that

alternative practices exhibiting more 'enterprise viability' should be used in agriculture.

The decoupling of production-related subsidies following the reform of the Common Agricultural Policy (CAP) in 2005 has left many farm enterprises with net margins that show a substantial loss (Jones, 2007). The decoupling was reinstated in the form of a single payment to associate subsidies to environmental protection requirements rather than agricultural production activities. Subsequent to these changes in the farm business, the objective in recent times is to make sure that any production that takes place is profitable.

Accordingly, Jack and Jones (2007) argue that neither gross margin nor net margin system is appropriate to accomplish this objective. Besides the decoupling issue, Jack and Jones (2007) have also identified six key changes of recent times that impact the cost structure of the farm business. For instance, costs have increasingly become less fixed owing to the resourcing of production activities and practices like casual labour, contractors, machinery rings, machinery leasing, etc. Although such practices are gradual but nevertheless are quite significant in agriculture. The removal of direct payments has also resulted in a less economically feasible production for the farmers and so, a more profound method of determining costs is required for the farms which will reflect cost savings if production is ceased (Jack, 2003). The recent growth of agri-environment schemes has reduced the intensity of agricultural production for environmental purposes as well (Defra, 2010). Additionally, the rise in inflation due to rising oil prices has raised fuel and repair

* Senior Lecturer, Department of Accounting & Finance, School of Business and Economics, North South University, Bangladesh. Email: nabila.nisha@northsouth.edu

costs of farms. Hence, costs which had been treated as fixed costs started varying with output. These costs cannot be controlled by increasing the production scale and thus the need for an improved approach for cost assessment and control is greater than ever.

Earlier, agriculture had the benefit of protection from the market and exemption from government regulations. Jack and Jones (2007) observed that the 1992 CAP reform have exposed farmers to health and social trends of the market, in addition to increasing demands from the government regarding standard, accountability, compliance, etc. With changing conditions, farmers need to focus more on costs and production constraints – thus necessitating the need for a suitable accounting method (Defra, 2010). The authors Jack and Jones (2007) argue that the concept of relevant costing can be applied in agriculture to combat these changing conditions. Jack and Jones (2007), in fact, presented their argument based on a review of the current academic literature, practitioner publications and interviews carried out with farmers and their advisors in around the year 2005.

Relevant costs and revenues have been defined as those future costs and revenues that will be changed by a decision, whereas irrelevant costs and revenues are those that will not be affected by a decision (Drury, 2004). Relevant costs are deemed to include opportunity costs, cash and incremental cashflows, whereas irrelevant costs include sunk or past costs, non-cash items, committed costs and group wide fixed overheads (Edmonds, Edmonds, Tsay, & Olds, 2008). The difference between the relevant costs and revenues of a decision alternative is the contribution and if the analysis results in a positive contribution, keeping qualitative factors constant, the decision should be favoured.

Relevant costing is usually used for short-term marginal decisions, like outsourcing a product or service, or whether to add or drop a product or service, etc (Defra, 2010). Therefore, it can be used in agriculture to determine whether it is worthwhile to continue production in the short-run. It uses nearly the same principles as those applied to existing approaches in agriculture like partial budgeting and other notable intuitive methods. Jack and Jones (2007) further state that under relevant costing, contribution analysis can be utilised for contract farming, whereas break-even analysis can be used to provide a visual picture of the decision-making process in terms of costs, revenues and even cost-price squeezes of the farm (Weetman, 2003).

However, the presence of cost discontinuities and stepped costs, along with its long-term nature of business makes it difficult to employ these practices of relevant costing as a strategic tool in agriculture. Nevertheless, the authors Jack and Jones (2007) consider relevant costing to be an intuitive accounting methodology for agriculture. The current accounting practices used in agriculture typically do not

respond very well to the particularities of farming (Argiles & Slof, 2000). Thus, Jack and Jones (2007) argue that relevant costing can be useful in agriculture for making tactical production decisions and strategic plans for the future. It provides the farm business with a visual break-even point, which the farmer can centralise when making decisions and review it against various price movements. To sum up, it is strongly a belief that practical demonstrations of this accounting concept and further exploration of costs can pave the acceptance of relevant costing in agriculture.

FEASIBILITY OF RELEVANT COSTING IN AGRICULTURE

Theoretical arguments in accounting may support the notion that relevant costing can be useful for short-term marginal decisions in agriculture, but the long-term nature of the business, the presence of discontinuities and stepped costs makes it difficult to apply the concept in reality.

Many excerpts from textbooks and Internet sources have specified that relevant costing can only be applied to some particular non-routine business decisions in the short-term like outsourcing a product or service, add/drop a product or service, special order decisions, etc. (Morse, Davis, & Hartgraves, 2003). Accordingly, the concepts of break-even and contribution analysis tend to measure short-term goals in a business decision (Weetman, 2003). Therefore, it can be said that relevant costing techniques can be applied to farm business decisions but only in the short-run. Examples can include outsourcing production, hiring more labour, making efficient use of scarce resources, raising prices or lowering them or even deciding on which particular grains to grow for the short-run profit maximisation of the farm business (Jack, 2003).

To prove the use of relevant costing in agriculture, three dummy crops common to agricultural companies worldwide has been selected and data gathered through secondary sources. Table 1 provides a comparative analysis of the three dummy crops in terms of accounting figures.

Table 1: Comparative Analysis

Criteria	Crop 1	Crop 2	Crop 3
Gross yield (kg):			
C1	1350	3150	1900
C2	500	700	600
C3	-	-	1200
Net yield (kg):			
C1	1350	2835	1710
C2	500	630	540

C3	-	-	1080
Gross income (\$):			
C1	243.00	510.30	307.80
C2	210.00	264.70	226.80
C3	-	-	64.80
Total	453.00	775.00	674.40
Variable costs: (\$)			
Labour	324.00	436.00	492.00
Other inputs	44.00	261.33	32.00
Fixed costs: (\$)			
Land	30.00	30.00	30.00
Depreciation of tools	10.00	25.00	15.00
Total costs: (\$)	408.00	752.33	645.00
Profitability Indicators (\$)			
Net income/kg	45.00	22.67	29.40
Net returns/labour day	4.56	4.21	4.24
Net returns/\$ cash input	1.02	0.09	0.92
Gross returns/\$ cash input	10.30	2.97	21.07

The analysis was conducted following Avila (1978, 1989). In this analysis, an economic comparison of the three dummy crops was done, wherein the performance criteria for the economic evaluation of outputs are calculated as follows:

Output

- **Gross yield:** This is the actual yield obtained in the field.
- **Net yield:** Gross yields are adjusted by reducing them by 10% to account for the usual losses.
- **Gross income:** Gross income is derived by multiplying net yield of each component with their respective field prices.

Input

- **Variable costs** (labour and other inputs): These are calculated from the quantity used and the respective field prices.
- **Fixed costs:** Land is included because it has an opportunity cost.
- **Depreciation:** reflects a cost due to the use of structures or equipment which has to be replaced after their productive cycle, in this case the tools. The linear model is used to calculate annual depreciation.

Next, profitability indicators for this short-term analysis are calculated as net or gross returns per unit of the scarce resource, again following Avila (1978, 1989). These indicators are calculated as below:

- Net Income (NI)/kg = Total gross income – Total costs

- Net Return/Labour Day = (NI/kg + Variable Labour Cost)/Total Labour Days
- Net Returns/\$ Cash Input = (NI/kg)/Variable Input Cost
- Gross Returns/\$ Cash Input = Gross Income/Variable Input Cost

However, one of the potential problems of relevant costing that came to the forefront from this analysis is that it generally assumes all variable costs to be relevant and all fixed costs to be irrelevant. This assumption is only correct within a very short-term horizon (Bhimani, Horngren, Datar, & Foster, 2008). With increasing level of business activity, variable costs are assumed to increase at a steady rate. But what if the farm takes advantage of bulk purchase discounts? In that case, variable costs tend to fall with rising business activity. Very few costs are thus truly variable in agriculture and so not always relevant in decision-making (Jack, 2003). Similarly, fixed costs tend to remain fixed up to a particular level of business activity. Beyond that, fixed costs change for a farm business. The level and extent of this change may not be easy to estimate in the volatile business environment of agriculture (Gowthorpe, 2008).

Jack and Jones (2007) also identified the presence of discontinuities and stepped costs in agriculture. In addition, this concept misleads decision-makers by using the same unit cost at different output levels and by including irrelevant costs of a particular decision in the unit costs (Bhimani *et al.*, 2008). Since the established definition of fixed and variable costs does not truly apply in agriculture and as unit costs cannot be the same for all farm output levels, the application of relevant costing is quite tricky here.

All decisions in the short-run are based on certain assumptions like definite knowledge about the demand, cost behaviour pattern, fixed and variable costs and the availability of complete and reliable information about the farm (Edmonds *et al.*, 2008). Relevant costing thus assumes that farm business decisions have no long-term implications upon them. Given the long-term nature of farming, the ultimate goal is to maximise long-run net cash inflow and so it is impractical to assume no long-run implications on farm business decisions and profitability. Relevant costing can lead to erroneous decision-making in agriculture if only short-run implications are considered (Jack, 2003). Moreover, the agricultural industry is volatile and factors like weather, disease and accidents can eliminate a crop or herd in the long-term. Also, global commodity prices along with political decisions relating to subsidisation and tariffs can have an impact on agricultural decision-making (Orshoven, Terres, & Eliasson, 2008).

Agriculture is thus an unpredictable business segment and the assumptions considered by relevant costing in the short-run are somewhat irrational. Business decisions in

agriculture cannot always be taken based on a quantitative analysis only. Qualitative factors must also be considered in relation to production, customers, and employees alike. For example, if the farm decides to outsource production owing to cheap labour costs in the other area, the relevant qualitative factors would be cost savings, unemployment for the farm's hired labour, issues of timeliness and quality of products, and such others (Orshoven *et al.*, 2008). These factors cannot be ignored since business decisions often change their direction due to the impact of qualitative factors (Edmonds *et al.*, 2008). However, the concept of relevant costing ignores qualitative factors in the decision-making process and thus can be deemed inappropriate for agriculture. The above arguments state that relevant costing techniques might be a useful decision-making tool for businesses in the short-run, but its application in agriculture is tricky and still unconvincing.

RELEVANT COSTING IN OTHER ORGANISATIONAL CONTEXTS

On a different note, what if relevant costing techniques are applied to some of the unconventional sectors of the economy like healthcare, tourism and educational institutions? How much practical will the relevant costing techniques be in the decision-making process of these sectors?

In today's changing environment, managers are required to make more frequent decisions that go beyond the everyday routine of running a healthcare organisation (Finkler, Ward, & Baker, 2007). Healthcare organisations often have to change their offerings with changing conditions and needs of the community. For instance, outpatient clinic might have been a popular service at one time. Upon calculation of its current revenues and costs, the organisation finds out that the clinic is incurring losses. The organisation might consider closing down the clinic. Hence, revenues will be lost but all variable costs relating to the clinic can be saved. Even some fixed costs like replacement of obsolete equipment can also be avoided upon this closure. However, maintenance expenses relating to the hospital building is irrelevant here, because whether the clinic closes or not the organisation has to bear this cost anyway. The clinic should only be closed if the amount of cost reduction is greater than the loss of revenue from the clinic. The consideration of a shut-down alternative of the outpatient clinic can thus be evaluated by the relevant cost analysis.

Healthcare organisations might also have to decide whether to expand or decline the volume of services being offered by the rehabilitation centre of the organisation (Berger, 2008). Suppose the organisation actively promotes their rehabilitation centre and the quality of its services to expand the volume. The incremental revenues in this case would

be the income from the additional number of patients who will come to the rehabilitation centre; but the incremental costs would be the publicity costs, the additional variable costs per patient, etc. In such decisions, the fixed cost is not much relevant unless the volume change is substantial. If the additional revenues offset the additional costs and increase the organisation's profit, then only the organisation can decide to expand the services.

Another common problem in healthcare organisations is whether laboratory tests should be performed in-house or contracted with an outside laboratory (Berger, 2008). In-house tests will incur incremental variable costs like salaries of lab technicians, chemicals, etc. for the healthcare organisation (Finkler *et al.*, 2007). If the contractor offers cheaper prices than the short-term incremental costs of conducting tests in-house, the organisation might opt for outsourcing.

In case of the tourism industry, the decision whether to hire cooks or contract catering services on a river cruise can be taken through relevant costing. Contracting catering services might be favourable if incremental costs are less than the costs of hiring a cook, because in-house food means purchase costs of utensils, salaries of cook, cleaners and assistants, grocery expenditures and so on. Again, arranging a special sightseeing programme for senior citizens will incur additional costs like salaries, fuel for a bus company but if the additional revenue from this one-off service offsets the costs, they might decide to arrange this sightseeing tour.

In contrast, educational institutions like schools and universities can also apply relevant costing to some of their decision-making processes. For example - if the administration considers introducing a coach service for students, they will have to consider the incremental revenues from this decision against the additional costs of starting this service. Therefore, if this additional revenue exceeds the incremental costs, the administration might opt to introduce transportation for students. Having made this decision, the administration will then have to decide whether to contract coach services from outside or undertake the whole operation in-house. In-house transportation will incur coach purchase costs, maintenance and fuel costs, driver's salary, etc. for the institution. If these costs are greater than the incremental costs of outside contract, the administration might decide to outsource transportation services.

Similarly, if the university administration decides not to offer a particular master's programme, they will be losing out the revenues from the students of this programme. However, they will be able to save the additional costs incurred for this programme, like salaries of staff and faculties. Fixed costs here are irrelevant, as maintenance and rent for the university building will still have to be incurred.

At a glance it might seem that in the short-run, relevant costing techniques are appropriate for decision-making in healthcare, tourism and educational institutions. However, the arguments of overlooking the qualitative factors and the long-run implications of business decisions on profit can eliminate relevant costing techniques as a comprehensive decision-making tool in these sectors (Morse *et al.*, 2003). For example, healthcare is often treated as not-for-profit organisation and in some instances it might decide to offer services, whether at a profit or loss. The organisation might then decide against the shut-down decision of the outpatient clinic and absorb losses in the long-run for the good of the community and other philanthropic reasons (Finkler *et al.*, 2007). In case of outsourcing decisions, the river cruise company might consider health issues and regard certain qualitative factors like quality of food, timely supply of food, hygiene issues, etc. and hence think otherwise. Similarly, if contracting transportation services is not considered to be safe, the university administration might change their decision for the safety and convenience of the students.

Thus, qualitative issues and long-term implications can actually change the decisions that had been implied by the relevant costing techniques. Moreover, certain assumptions of relevant costing like complete and reliable information and definite knowledge about costs, prices and demand trends and fluctuations are completely unreasonable in real life decision-making. Ultimately, it is not about any particular sector of the economy; rather, it is the assumptions on which the concept of relevant costing is applicable that are not suitable for business decision-making.

CONCLUSION

Despite its relative importance to the economy, agriculture has not received much attention from accounting researchers and practitioners and for this reason it lacks appropriate decision-making tools (Jack, 2005). However, too strong a focus on the concept of relevant costing can lead to erroneous decision-making in not only agriculture but also other sectors of the economy. Theoretical evidence shows that assumptions of the relevant costing concept are not practical and it disregards the impact of qualitative factors and long-run implications on profit. Therefore, it can be concluded that relevant costing is not really suitable for realistic business decision-making and alternative approaches should be explored to devise a proper decision-making tool that can be applied to all sectors of the economy.

REFERENCES

Argiles, J. M., & Slof, E. J. (2000). New opportunities for farm accounting. *European Accounting Review*, 10(2), 361.

- Avila, M. (1978). *An economic evaluation of annual cropping systems in two regions of cost a rica*. Ph.D Dissertation, University of Missouri, USA.
- Avila, M. (1989). Socio economic Issues in Alley Farming. Paper presented at the AFNETA Inaugural Meeting, IITA, Ibadan, Nigeria.
- Berger, S. (2008). *Fundamentals of health care financial management: A practical guide to fiscal issues and activities* (3rd ed.). San Francisco: Jossey-Bass A Wiley Imprint.
- Bhimani, A., Horngren, C.T., Datar, S. M., & Foster, G. (2008). Relevant information for decision making. *Management and Cost Accounting* (4th ed.). Harlow, Essex: Prentice Hall, Europe.
- Defra. (2010). *Definitions of terms used in farm business management* (3rd ed.). Retrieved from <http://www.defra.gov.uk/foodfarm/farmmanage/advice/documents/def-of-terms.pdf>
- Drury, C. (2004). Measuring relevant costs and revenues for decision-making. *Management and Cost Accounting* (6th ed.). London: Thomson Learning.
- Dugdale, D., Jones, T. C., & Green, S. (2006). *Contemporary Management Accounting Practices in UK Manufacturing* (1st ed.). Great Britain: CIMA Publishing.
- Edmonds, T. P., Edmonds, C., Tsay, B., & Olds, P.R. (2008). *Fundamental managerial accounting concepts* (5th ed.). McGraw-Hill Irwin.
- Finkler, S. A., Ward, D. M., & Baker, J. J. (2007). Costing for non-routine decisions. *Essentials of cost accounting for health care organizations*. Retrieved from Google Book Results:
- Gowthorpe, C. (2008). Marginal costing and decision-making. *Management Accounting*. Singapore: Seng Lee Press.
- Jack, L. (2003). Stocks of knowledge, simplification, unintended consequences: Their links to professionalization and accounting education in agricultural performance measurement. Retrieved from http://www.essex.ac.uk/ebs/research/working_papers/WP03-09.pdf
- Jack, L. (2005). Stocks of knowledge, simplification and unintended consequences: the persistence of post-war accounting practices in UK agriculture. *Management Accounting Research*, 16(1), 59-60.
- Jack, L., & Jones, J. (2007). Facing up to the new realities: The case for relevant costing and target costing in agriculture. *Journal of Applied Accounting Research*, 8(3), 116-132, 138-140.
- Jones, J. (2007). The use of relevant cost analysis to assess production viability following the decoupling of support payments in England. *Farm Management*, 412.
- Morse, W. J., Davis, J. R., & Hartgraves, A. L. (2003). *Management accounting: A strategic approach* (3rd ed.). London: Thomson Learning.

Orshoven, J. V., Terres, J., & Eliasson, A. (Eds.). (2008). *Common bio-physical criteria to define natural constraints for Agriculture in Europe*. Retrieved from <http://agrienv.jrc.ec.europa.eu/Common%20Criteria%20Fact%20sheets.pdf>

Weetman, P. (2003). Break-even analysis and short-term decision-making. *Management accounting: An introduction* (3rd ed.). Harlow, Essex: Prentice Hall, Europe.