



Research note

Pricing decisions and the neoclassical theory of the firm

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Abstract

Many accountants seem to have accepted the existence of a ‘reality gap’ between management accounting’s conventional wisdom, based on the neoclassical economic theory of the firm and actual business practice. Whilst the former recommends the use of a decision relevant cost approach to pricing decisions, the latter is believed to be dominated by a full cost plus approach to pricing. In accepting the existence of a reality gap, accountants do not seem to have addressed the arguments of economists. These arguments seriously undermine the research findings of accountants that have given rise to the belief in such a gap.

On the other hand, the empirical evidence supporting neoclassical price theory is not strong and much of the research that generated it is methodologically flawed. This paper evaluates the research supporting the accountants’ and economists’ respective positions and argues that neither is strongly supported by the conflicting empirical evidence. It then identifies the issues that need to be resolved by future research intended to assess whether empirical evidence supports neoclassical price theory or (full) cost plus pricing.

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1. Introduction

Ryan et al. (2002, pp. 70–71) have observed that, as management accounting emerged in the 1950s and 1960s as an academic discipline, a neoclassical economics framework was widely used by accounting researchers to analyse decision making contexts. This framework, the authors observe, had a significant impact on the emergence of management accounting techniques in the academic literature—including those used for pricing and product mix decisions.

Leading modern management accounting textbooks (e.g. Drury, 2000; Atkinson et al., 1997; Horngren et al., 2002) assert that the provision of cost information for pricing and product mix decisions is an

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important function of management accounting. Within the neoclassical framework, this requires the identification of ‘relevant costs’—that is, incremental cash flows, given the time scale implied by the decision. These same texts, however, also refer to the empirical findings of accounting researchers which suggest that actual business practice does not correspond to neoclassical assumptions.

In the last two decades, accounting researchers (for example, Shim and Sudit, 1994; Emore and Ness, 1991; Cooper, 1990b; Govindarajan and Anthony, 1983; Gordon et al., 1980 in the USA; Drury and Tayles, 2000; Bright et al., 1992 in the UK) appear to have uncovered evidence that full cost (referred to in the economics literature as normal cost) pricing is the dominant form of pricing behaviour. These findings confirm the earlier ones for the UK (Finnie and Sizer, 1983; Scapens et al., 1983).

The ‘full cost’ is the one typically supplied by the firm’s accounting system and which is prepared in accordance with financial reporting requirements based on the ‘matching principle’. To this cost—which cannot be construed as a legitimate estimate of the incremental or avoidable cost of a product—is added a ‘normal’ profit mark up. Full cost/normal cost pricing seems to be commonplace in both manufacturing and service industries—witness, for example, the pricing policies of professional service firms of accountants and solicitors.

The full cost price is not inviolate; respondents may claim to use cost information ‘flexibly’ (Drury and Tayles, 2000). For example, mark ups are varied in accordance with changes in market conditions and the degree of spare capacity may influence the extent to which it is considered essential to recover fixed overheads. Nevertheless, the full cost price remains an important benchmark and exercises a significant influence over the price finally decided upon. It is considered typically as the ‘normal’ or desirable target price from which unusual circumstances may require some deviation. Lee (1998, p. 206) describes three types of cost plus pricing: full cost (normal cost) pricing, mark up pricing (based on direct cost only) and target rate of return pricing (also based on full cost). He also observes, from his survey of research findings, that full cost-based methods are far more common than the direct cost-based method.

Clearly, the practice of full cost pricing is at variance with that recommended by the management accounting textbooks as described by Drury et al. (1993, p. 19).

The management accounting literature advocates a decision relevant approach in which selling prices are determined after undertaking special studies that compare incremental revenues with incremental costs. Estimating incremental revenues requires demand estimates to be prepared for a range of possible selling prices. The optimal selling price is the price that maximises the contribution towards common/unavoidable fixed costs and profit.

This is equivalent to the economists’ postulate that price is set at a level which equates marginal cost and marginal revenue—a central proposition of neoclassical price theory.

This apparent dichotomy between the conventional wisdom of the textbooks and actual practice has given rise to a so-called ‘reality gap’ (see, for example, Scapens, 1991, p. 34). Several commentators have attempted to explain this gap between theory and practice (Scapens, 1991; Ahmed and Scapens, 2000; Drury, 1996). One suggestion is that:

the competitive conditions which underlie management accounting’s conventional wisdom, are not appropriate to the circumstances of management accounting in practice. (Scapens, 1991, p. 34)

In other words, the neoclassical economic theory of the firm on which management accounting textbook theory is based, must be called into question.

Curiously, the accounting literature makes little if any reference to the substantial body of research undertaken previously by economists. This seemed to satisfy the mainstream of the economics profession that, by and large, firms do use relevant costs in pricing and product mix decisions—and thus appeared to vindicate neoclassical theory.

Throughout the 1940s and 1950s economists engaged in what became known as the ‘marginalist controversy’ which culminated in two powerful arguments which suggested that survey results (such as those of later accounting researchers) simply could not be taken at face value in appearing to undermine neoclassical price theory.

The reality gap postulated by accounting researchers cannot be accepted unless the economists’ arguments are addressed. This paper discusses these arguments and their implications for accounting research findings. It also evaluates the evidence cited in support of the neoclassical theory and on the basis of this evaluation, suggests directions for future research.

The paper is structured as follows. The next section describes the marginalist controversy and its apparent resolution, to the satisfaction of most economists, in favour of the neoclassical theory. The third section discusses the substantive and methodological shortcomings of the research whose results are cited in support of the neoclassical model. These shortcomings suggest that the marginalist controversy cannot be considered to be resolved—implying that the existence of the accounting researchers reality gap remains an unsettled question. [Section 4](#) discusses the feasibility of determining incremental/avoidable product costs in a multi-product firm and, by implication, the plausibility of the marginalist, neoclassical model. [Section 5](#) then identifies the issues to be resolved by future research, drawing on the shortcomings of existing empirical evidence, as identified in [Section 3](#) and the technical issues surrounding product costing discussed in [Section 4](#).

2. The marginalist controversy

In 1939, Hall and Hitch uncovered evidence that firms did not, typically, adhere to the marginalist principles of neoclassical economics by setting prices at a level which equated marginal revenue with marginal cost. Rather, Hall and Hitch found that price was set by adding a (fairly constant) mark up to full cost. Not surprisingly, economists fought back vigorously in defence of their marginalist, neoclassical paradigm. [Edwards \(1952, p. 298\)](#), for example, based on his own case study research and direct business experience, contended that:

Those who argue that the automatic basing of prices on conventional cost statements is the rule have not taken adequate account of the informal and unrecorded stages in the price fixing process. Before the preparation of the cost estimate and between its preparation and the actual determination of price, discussion usually takes place about the assumptions underlying the cost figures and about the market situation.

2.1. *Implicit marginalism*

Edwards and other researchers claimed to have uncovered substantial evidence of ‘implicit marginalism’. This phrase describes the situation where, although firms may not consciously think in terms of equating marginal revenue and marginal cost, they nevertheless act as though they were doing so. In the same way, while an expert billiards player may not consciously be aware of the theorems of geometry, he

nevertheless acts in accordance with them (Friedman, 1953, p. 21). In other words, marginalist theory may be vindicated even if firms do not explicitly and consciously act in accordance with its assumptions.

The position has been well articulated by Langholm (1969, p. 10)

The marginal theory of price was never intended to serve as a blueprint for entrepreneurial decision making or indeed to describe or explain in detail what actually takes place in the firm. It is of the nature of an explanatory device on a much higher level of abstraction, permitting only broadly generalised deductions about the aggregate effects of entrepreneurial behaviour. Its merit as such was never a fully settled question. But obviously, it takes more to disprove it than demonstrating that actual price makers do without marginal reasoning. The crucial question is whether the prices reached in a different way, produce aggregate effects which are predictable in the marginal system.

Although there have been a number of case study-based research programmes whose findings directly undermine marginalist theory (notably that of Barback, 1964) it seems, nevertheless, that implicit marginalism has remained the mainstream orthodoxy in economics—Cyert and March's (1992) *A Behavioural Theory of the Firm* notwithstanding. The neoclassical paradigm still dominates undergraduate economics textbooks, while the marginalist controversy is only a footnote/appendix in most intermediate to advanced texts.

2.2. *Friedman's instrumentalist argument: the neoclassical model and research methodology*

Implicit marginalism, conceived of as Edward's informal and unrecorded adjustments to the full cost plus price, was the first argument developed in defence of neoclassical price theory; the second was Friedman's (1953, p. 22) instrumentalist argument.

The neoclassical theory of the firm is concerned with how scarce resources are allocated between competing demands on them via the workings of the price mechanism. This *raison d'être* implies, as Friedman has argued persuasively, that it is the outcomes of decisions that matter—not the decision process itself. (The expert billiard player, cited by Friedman and referred to earlier in this paper, illustrates this proposition well.) The 'acid test' of a theory, therefore, is whether it satisfactorily predicts outcomes, regardless of how those outcomes are reached. It is quite possible that a firm has discovered, through experience, that setting price at full cost plus a mark up of, say, 20% results in the most profitable outcome. That is, it arrives at the same result that would have been reached if the firm consciously tried to equate marginal revenue and marginal cost in establishing selling price.

Friedman's instrumentalist view of theory is grounded in a Humean version of positivism (Lawson, 1994, p. 503). This version asserts that all that is real and can be known, is that which can be observed by the physical senses. Thus, science is concerned with identifying patterns or relationships between objects or events, of the form 'if X, then Y'. Econometrics, specifying quantitative relationships between observable phenomena, epitomises this model of science; case studies, such as those conducted as part of the marginalist debate, clearly violate it—being concerned with the actual decision process rather than testing events or outcomes. Similarly, questionnaire surveys, which analyse the relative frequency of occurrence of different pricing methods, do not test the outcome of relevance: is the resultant price the profit maximising one which would have been reached if the marginal calculus had been applied?

It follows from this argument, that the only valid test of neoclassical price theory is an econometric one which seeks to explain whether the actual selling price is at, or close to, the price which equates marginal

cost and marginal revenue. Thus, the survey evidence cited in the management accounting literature as appearing to undermine neoclassical theory, together with case study evidence appearing to conflict with neoclassical theory, could be ruled out as irrelevant. The implicit marginalism and instrumentalist arguments together preserved neoclassical theory as the dominant paradigm in economics and, by implication, in management accounting.

3. The marginalist controversy revisited

Leading management accounting texts (e.g. Horngren et al., 2002; Atkinson et al., 1997; Drury, 1996) in discussing the importance of using relevant costs for pricing decisions, refer also to the survey results of accounting researchers, as indicating the widespread use of full cost pricing and thus of a gulf between theory and practice. The implicit marginalism and instrumentalist arguments, however, imply that these survey findings cannot, per se, be considered to have refuted or seriously undermined neoclassical price theory. The question remains, however, as to the extent to which the theory is supported by empirical evidence. Friedman's instrumentalist argument implies that the only legitimate test of neoclassical theory is an econometric one. What does the econometric evidence suggest?

3.1. *Econometric studies*

There have been a number of econometric studies undertaken by economists to test the full cost hypothesis. Using industry level data, regression analysis has been carried out to determine whether prices are determined by a fixed mark up \times historical, normal prime cost (=full cost), independent of the conditions of demand. The results of such research have been conflicting. Neild (1963) found that prices were determined by normal cost \times a fixed mark up (equivalent to Hall and Hitch's full cost pricing principle). Rushdy and Lund (1967) found that the full cost principle was not borne out and that demand did appear to exert an influence on price changes. They argued that even Neild's own findings showed this when account was taken of his flawed methodology.

Later studies, however, by Godley and Nordhaus (1972) and Coutts et al. (1978) appeared to vindicate the full cost hypothesis. Smith (1982) on the other hand, found that the mark up is responsive to demand—as proxied by the degree of capacity utilisation. More recent studies by Lee (1994) and Iyoda (1999) add support to the full cost pricing hypothesis. Martin (1997) on the other hand, found that prices are related to marginal rather than average (full) cost. Collectively, these studies suggest that the full cost pricing controversy remains unresolved.¹

3.2. *The validity of non econometric research evidence*

There are, however, powerful counter arguments against Friedman's instrumentalist position. The essence of Friedman's argument is that it is not appropriate to test the assumptions of a theory: the realism (or otherwise) of its assumptions is irrelevant; only its predictive power matters.

¹ The foregoing are representative examples of econometric studies; for a more comprehensive review of econometric studies see Downward (1999).

Samuelson (1966, p. 1774) and Hutchinson (1966, pp. 81–83) among others, believe that it is appropriate to test directly the assumptions of a theory empirically. The realism, or lack of it, of assumptions may be relevant where they:

are believed to be false or highly improbable in the light of directly perceived evidence about economic behaviour—for example, when business firms are observed to commit themselves to a fixed rule of thumb for pricing their products, irrespective of economic circumstances. (Blaug, 1992, pp. 92–93)

Blaug has identified the weakest link in Friedman's argument as his commitment to the methodology of instrumentalism:

“The only relevant test of the validity of a hypothesis”, Friedman tells us “is a comparison of its predictions with experience”.

But such a comparison may show that a particular theory predicts accurately, although the theory as such provides no explanation, in the sense of a causal mechanism, to account for the prediction. Science, it may be argued, ought to do better than merely predict accurately. (Blaug, 1992, p. 98)

If accurate prediction is the only relevant test of the validity of a theory, it would be impossible to distinguish between genuine and spurious correlation. As Blaug (p. 96) observes:

The traditional theory of the firm treats the firm as a ‘black box’ without explicating its internal decision making machinery. An inquiry that seeks to throw light on the nature of the ‘black box’ must, surely, illuminate the attempt to test predictions.

Blaug points out that Friedman himself concedes this point. To quote directly from Friedman, asking businessmen what they do and why they do it is:

almost entirely useless as a means of testing the validity of an economic hypothesis. (quoted in Blaug, 1992, p. 97)

although it may be useful in

suggesting leads to follow in accounting for divergences between predicted and observed results (*ibid.*).

There are thus good grounds for accepting the legitimacy of non econometric research into pricing decisions. Moreover, this may be all that is available for *testing* neoclassical theory, given the inherent limitations of econometrics. As Downward (1999, p. 92) has observed, few if any disputes have been resolved by econometric studies. He cites Frish's (1948, pp. 367–372) argument that it is impossible for regression methods to separate sufficiently accurately the effects of different independent variables so as to derive accurate parameters—as would be necessary in distinguishing between competing theories. Keynes (1939, p. 567) also, was sceptical of econometrics in principle:

the main *prima facie* objection to the application of the method of multiple correlation to complex economic problems, lies in the apparent lack of any adequate degree of uniformity in the environment.

Thus, for Keynes, the openness of economic systems places a fundamental obstacle in the way of regression techniques being applied to economic data. As Downward has observed, neither Frish's nor Keynes's methodological concerns have been adequately addressed. Downward (1999, p. 92) describes how the inherent methodological problems typically result in econometricians re-specifying their model until the

appropriate parameter values are obtained for the variables in the model. Thus, pricing studies by Neild (1963), McCallum (1970) and Rushdy and Lund (1967) all report radically different accounts of pricing (i.e. full cost versus neoclassical) from the *same* data set.

Thus, it may, with some justification, be argued that econometric testing of market data is incapable of distinguishing between different theories of pricing behaviour—leaving non econometric methods as all that are available:

It is seldom indeed, that we have a clear case where the statistical data can actually determine numerically an autonomous structural equation We must (therefore) look for some other means of getting information The only way possible seems to utilise to a much larger extent than we do so far, the interview method, that is we must ask persons or groups, what they would do under such and such circumstances. (Frish, 1948, p. 370)

3.3. Case study evidence

There are thus powerful arguments for admission of non econometric evidence in testing neoclassical theory. One could invoke the arguments put forward by Edwards (1952) and Pearce (1956) in response to the findings of Hall and Hitch (1939) to reject survey (questionnaire) research such as that carried out by the later accounting researchers. Large scale questionnaire surveys are not suitable for uncovering the informal and unrecorded adjustments cited by Edwards. Pearce, for example, showed that in one firm, whose managers firmly believed they worked on full cost plus pricing, prices found by this method became the actual prices in only a minority of sales! This strongly supports the argument of Edwards and Pearce for in depth, case study research.

On the other hand, one could examine the case study evidence which is cited in support of the marginalist position, to see whether it is sufficient to justify the claims of implicit marginalism. An examination of this case study literature seems to suggest it is not! Whatever the terms in which managers think, or the terminology they use,² the practice of implicit marginalism must involve a comparison of potential revenue at a range of possible selling prices with the avoidable costs at the corresponding level of output (having regard to the time-scale implied by the decision).

There seems to be a wide consensus that the starting point in many pricing decisions is the establishment of the full cost plus price as an ideal, or target price (Lee, 1994). The issue is the nature and extent of the informal and unrecorded adjustments to which Edwards referred. The existing pro marginalist case study evidence falls into two categories. The first (e.g. Edwards and Pearce) discusses explicitly the many examples of adjustments to the profit mark up to reflect market conditions. This could reasonably be accepted as the firm testing-out its unknown demand curve and by implication its unknown marginal revenue function.

The discussion is much less explicit when it comes to the adjustments to the cost base. Here the application of marginalist principles would involve moving from ‘full cost’ to avoidable cost via a series of informal and unrecorded adjustments. There is little if any discussion in the case studies of how the firm moves from ‘full cost’ (containing non avoidable and often arbitrarily apportioned fixed costs) to avoidable cost. This is a formidable analytical task, as will be discussed in Section 4 of this paper, which concerns the practical difficulties of determining avoidable cost in a multi-product firm.

² Machlup (1946), one of the most prominent champions of marginalism, believed that the marginalist controversy was all the result of confusion over terminology between academic researchers and businessmen.

The second category of case study evidence (see, for example, Fog, 1960; Hague, 1971; Bruegelmann et al., 1985) does discuss adjustments to the full cost figure, but only those which involve distinguishing between (short run) variable cost and ‘fixed’ cost. These case researchers argue, in effect, that decision-makers only really take into account the direct cost, typically assumed to be synonymous with short run variable cost.

Even if this is what happens, it would not produce optimal long-term pricing and product mix decisions, because use of such a cost base ignores the fact that many short-term fixed costs are often avoidable with respect to a particular product over the longer term. Short-run marginal cost may be appropriate for one off short-run decisions such as whether to accept a special order when the firm has excess capacity. It is not, however, a suitable basis for regular pricing decisions. Shillinglaw (1963) recommends the use of attributable cost for such decisions.

Thus, case study evidence does not strongly support the full application of marginalist principles.³

3.4. *Methodological shortcomings of empirical research*

Mongin (1991, p. 247) and Downward (1994, pp. 23–43) have suggested explanations for why the debate has remained unresolved. These explanations emphasise the methodological shortcomings of the empirical research.

Mongin argues that the main reason for lack of resolution of the debate, was that it never reached the level of a careful, quantitative test (at the level of the individual firm) of the sort undertaken by Langlois (1989). Such testing was not considered necessary, because most economists satisfied themselves that the marginalist model was empirically verified by existing evidence. This evidence, however, was described by Mongin as benign marginalism—the view that any evidence of incremental reasoning, of weighing up costs and benefits, is equivalent to the full application of optimising marginalist principles:

Not every incremental reasoning is an optimising one: the businessman may as well content himself with comparing net incremental values with some threshold value—a case of satisficing, or limit his computations to a subset of his feasible set, a case of simplified optimisation; or take one of the relevant variables (revenue) as given at some value while minimising the other, a case of sub optimisation. (Mongin, 1991, p. 247)

4. The practical difficulties of obtaining marginalist information for pricing decisions

In assessing the plausibility of the implicit marginalism hypothesis, it is salutary to consider the practical difficulties involved in ascertaining the avoidable cost of any particular product in a multi-product firm. What would be involved in moving from ‘full cost’ (as typically produced by the firm’s cost accounting system) to avoidable cost? In a multi-product firm, knowledge of the avoidable cost of a particular product is usually unattainable. As Shillinglaw put it in his paper on attributable cost:

Products typically pass through multi-purpose facilities in common with other products. Two or more products are yielded jointly from a single set of combined inputs. Cost functions are not continuous but disjointed, due to indivisibilities in inputs. Some indivisibilities span minor portions of the output range; others may encompass virtually the entire range of practicable output Given these

³ A comprehensive discussion of case study evidence on this topic can be found in Downward (1999).

underlying conditions, measurement of long run marginal cost would require a knowledge of the cost structure that is unattainable (in Solomons ed., 1968, p. 141)

The best a firm can do is to obtain a proxy for avoidable cost based on a decision as to which (short run) fixed costs to allocate to particular products and which to leave in the common cost pool. That is, which costs are variable with respect to some measure of product related activity over the time scale affected by the decision? Facility sustaining costs would typically need to be excluded as being non avoidable with respect to a particular product, even over the longer term. So too, would product related but indivisible⁴ resource costs.

This suggests that the practice of implicit marginalism, would involve a detailed and fairly sophisticated analysis separating fixed cost into its potentially avoidable and non avoidable components, having regard to the timescale affected by the decision. It would also (usually) require a reassignment of the avoidable fixed costs according to bases which more accurately reflect the causes of such costs—rather than the sort of generic bases like labour/machine hours which are typically used. Do managers really perform such an analysis?

4.1. *Activity-based costing and attributable cost*

Comparatively recent developments in our understanding of cost behaviour have resulted in the emergence of activity-based costing, which is intended to capture longer-term avoidable cost. It is still, however, only a minority of firms which use ABC (Drury and Tayles, 2000). Even where it is used, the conditions which would produce a good proxy for long run avoidable costs are not typically fulfilled—the cost of many indivisible fixed costs being assigned to product units as a result of the multi-stage allocations used in most cost accounting systems. As Woods (1992, p. 54) explains:

All costs incurred within an organizational unit, along with costs assigned from other units whose cost drivers it uses, are further assigned to the unit's services or products, with its cost drivers as a base. If the producing unit is a production department, the recipient of its costs will be its physical products (thus) ABC mixes fixed and variable costs before assigning them to outputs, a circumstance that can lead to sub-optimal decisions.

Noreen (1991) has identified the necessary and sufficient conditions for a conventional, two stage activity-based costing system to provide incremental (avoidable) product costs for a given set of input prices as being that:

1. Total costs can be partitioned into independent cost pools, each of which is driven by one and only one activity driver. Noreen points out that, in principle, every cost is a product of a price and a quantity of something—which could be regarded as an activity. However, the number of different activities that can be practically accommodated in cost systems, and hence the number of cost pools is limited. It is, therefore, necessary to choose an activity that is a satisfactory proxy for all these elementary activities.
2. Costs in each cost pool are strictly proportional to the level of the activity in that cost pool. As Noreen observes, this rules out, at the level of the cost pool, non linear cost functions and linear functions in which there are non zero intercepts (i.e. fixed cost elements). That is, costs that are not strictly

⁴ The term 'indivisibilities' refers to the phenomenon whereby, whilst it is usually possible to double an input, it may not be possible to halve it. Indivisible resources, therefore, give rise to truly fixed and hence non attributable costs.

variable at the level of the cost pool should be excluded from the allocations made within the formal cost accumulation system and dealt with in some other way.

3. Each activity can be partitioned into discrete elements, each of which can be attributed to a particular product. That is, the total volume of activity in a cost pool for a period can be determined by aggregating the activity amounts required by each product from that cost pool. This, says Noreen, rules out all dependencies between products in the production process. In particular, this rules out joint processes. In joint processes, the demands on a resource are determined by the maximum of the demands placed by the individual products and not by their sum.

Together, these conditions ensure that cost pools represent the incremental cost of the activity concerned and that the charge made to each product reflects the incremental cost of that product (i.e. its demands on the cost pool's resources).

Bromwich and Hong (1999) have specified the prerequisites that must be placed on technology and input prices, for a typical two stage ABC system to satisfy Noreen's conditions.

1. For total cost to be partitioned into independent cost pools representing incremental activity costs requires:
 - (a) Production function separability. This means that inputs into a cost pool must be separable from those of other activities, i.e. the mix of inputs of an activity must be unaffected by the level of inputs in other activities. This condition is known in the economics literature as production function separability (Chambers, 1988). This attribute depends on whether the firm's production operations can be divided into a set of free-standing operations, so that optimal decisions (i.e. input mix choices) for each set of operations can be determined in isolation from other operations.
 - (b) Non jointness between activity cost pools. This means that, operations in one cost pool must not affect the costs of other cost pools. This implies the absence of economies of scope between cost pools. Economies of scope between cost pools exist where it is cheaper to perform two activities together rather than each separately.

Whereas production function separability concerns whether inputs for different activities can, in principle, be specified independently of each other, non jointness concerns whether activities are, in fact, performed separately. A profit maximising firm will perform activities jointly if this costs less than performing them separately. Costing systems should not, therefore, treat them as separate cost pools—the joint cost will be less than the sum of the incremental cost of the separate activities.

2. The use of a single aggregate cost driver to represent the elementary inputs of a cost pool, so that a product's consumption of the cost driver reflects the incremental cost of the cost pool resources, requires a constant mix between all pairs of inputs irrespective of activity volume. A constant input mix (for a given set of input prices), regardless of the level of output, is a characteristic of a homothetic technology. For homothetic production functions, the marginal rate of substitution for the optimal combination of inputs will be the same at all levels of output. Thus, a proportionate change in all inputs will be reflected by the same proportionate change in the single aggregate cost driver. As Bromwich and Hong observe, the constant input mix ratio means that the aggregate input (i.e. cost driver) is a complete proxy for changes in the bundle of elementary inputs.
3. For each activity to be partitioned among products such that the portion attributed to each product depends only upon that product, requires that the amount of resources used by a cost pool for a product must be invariant with the amount of resources used for other products serviced by the cost pool; and this must be true for all cost pools used by the product. The incremental cost of a product will then

be unaffected by increases or decreases in the volume of other products. This requires the absence of economies of scope within each cost pool.

Bromwich and Hong identify a further requirement as being the existence of a perfect market for inputs. This is necessary to ensure that input prices are linear with output or activity volume, otherwise identical inputs may have different prices. Moreover, there should be no artificial constraints on the supply of factors, causing the opportunity cost of units of a given input to differ depending on whether or not any constraint is binding.

As these authors observe, in so far as the chosen cost pools and cost drivers do not reflect the above conditions, this will generate product cost distortions. They also observe that current analytical knowledge is not sufficient to suggest the degree of these distortions. By implication, therefore, there are no a priori grounds for expecting that ABC systems will better approximate avoidable cost than do 'traditional' costing systems.

Their conclusion is that the conditions required for ABC systems to capture the incremental/avoidable cost of a product are very stringent and seldom met in practice.

4.2. Summing up the case for implicit marginalism

It seems, therefore, that behaviour in accordance with the postulates of neoclassical theory via the practice of implicit marginalism, would involve a considerable amount of sophisticated analysis by management—mostly bypassing the firm's formal accounting system—whether it be a traditional absorption or activity based one. It is possible, of course, to fall back on a sort of functionalist argument, that since the (implicit) application of marginalist principles produces optimal solutions, only firms applying such principles would survive.

This argument is actually employed by Friedman (1953, p. 22) to support, his contention that firms must be achieving the same outcome as would be achieved using marginalist principles, no matter how unlikely this would appear from the pricing rule of thumb actually used. The argument is very problematic, however, since there are so many other contingent variables affecting survival.

According to Nelson and Winter's *Evolutionary Theory of the Firm* (1982), for example, firms must continually search for solutions to problems as they interact with their environment. The outcomes of search however, are subject to stochastic variation. Differential outcomes from search result in differential rates of survival and growth in firms. Consequently, differential survival rates cannot be invoked as confirming the application of marginalist principles (i.e. since only those practising it will survive, most surviving firms must be practising it).

It is doubtful, therefore, whether deductive reasoning can provide the necessary answers and further empirical research is needed to provide insights into the nature of the cost information used in pricing/product mix decisions. Based on existing econometric and case study evidence, it seems, the marginalist controversy remains unresolved.

5. Future research directions and issues to be resolved

This paper has argued that the marginalist controversy remains unresolved. This lack of resolution has important implications for management accounting researchers concerned about the existence of a reality

gap between theory and practice. The shortcomings of existing empirical evidence suggest the possible directions for future research in this area.

Orthodox economists are, arguably, primarily concerned with aggregate economic behaviour and its implications for optimal resource allocation. They may, therefore, be primarily interested in quantitative/econometric studies that test decision outcomes, rather than process—subject to the inherent problems of econometric methods referred to previously.

The results of such research may also be of interest to accountants: an awareness of the competitive conditions within which firms operate is relevant to management accounting as an academic discipline predicated on neoclassical assumptions.

Management accounting researchers may be more interested, however, in how individual firms make decisions, given that management accounting is often instrumental in this process. Given the failure of large-scale surveys to capture implicit marginalism, it would seem that accountants' attention should be turned towards further case study research.

5.1. *Future case study research*

For those rejecting Friedman's instrumentalist view, case study research may be used to provide useful insights into how firms analyse costs for pricing decisions.

In [Section 3](#), it was argued that the main weakness of the existing case study research evidence, is its lack of precision in specifying the extent to which the cost base used is a good representation of avoidable cost. Future case study research could examine, in detail, the nature of the cost base used from the perspective of the more sophisticated framework for cost analysis provided by [Cooper's \(1990a\)](#) ABC cost hierarchy. ABC, as noted in a previous section, has provided a better framework for understanding cost behaviour than the simplistic fixed versus variable classification of costs.

Such research could attempt to establish whether the cost analysis performed for pricing decisions results in the allocation of all unit level, batch level and product sustaining costs—using appropriate bases and subject to the existence of indivisibilities—and the non allocation of non avoidable facility sustaining costs. Such an analysis of costs would be necessary for the cost base to represent the avoidable cost of the product accurately—regardless of whether the firm's formal cost accumulation system is designated traditional or ABC and regardless of whether the analysis is formalised, via the accounting system, or undertaken in an ad hoc, informal way.

This more sophisticated framework for analysing costs was presumably unavailable to the earlier economics case study researchers. It is thus very questionable whether the firms cited by them as basing pricing decisions on direct cost (and thus practising implicit marginalism) were really capturing the attributable cost of the product. We now know ([Kaplan, 1989, pp. 6–7](#)) that many batch level and product sustaining costs are (incorrectly) classified by firms' formal cost accounting systems as *indirect* costs—and tend to be considered by managers as such.

Allocation of unit, batch and product sustaining costs, using appropriate bases and subject to indivisibilities, is a necessary but not a sufficient condition for the cost base used in pricing decisions to reflect the avoidable cost of a product. It will also be necessary for the costing system used for pricing to conform to [Noreen's \(1991\)](#) conditions. These, in turn, require that [Bromwich and Hong's \(1999\)](#) conditions concerning technology and input prices be fulfilled.

An additional consideration arises when complexity, uncertainty and information costs are introduced: do the benefits of such a sophisticated cost analysis justify the costs? Failure to perform such an analysis

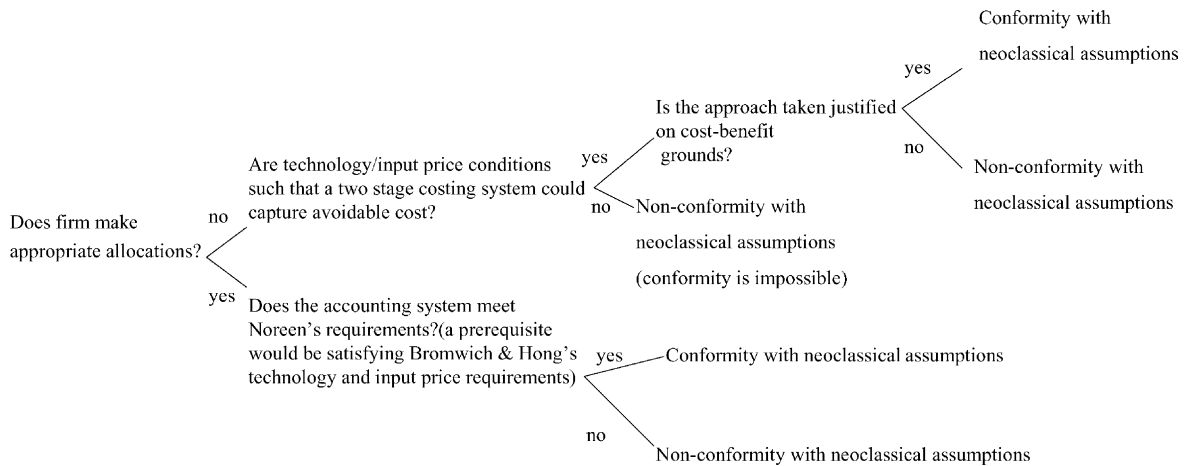


Fig. 1. Case study research programme: analytical framework.

may be consistent with the neoclassical profit maximisation assumption, if the costs of performing it outweigh the benefits.

Combining these considerations, results in a multi-stage research process in order to investigate compliance with the neoclassical profit maximisation assumption, with respect to the cost base used in pricing decisions. The stages in the process are delineated in Fig. 1.

The first stage requires a detailed study of the firm's cost structure to distinguish unit, batch, product sustaining and facility sustaining costs and to identify the allocation bases used—and whether the requisite costs are allocated at all. If the appropriate allocations are made, using appropriate bases, the next stage must be to determine whether Noreen's conditions are met. This will include a detailed study of the firm's operations to ascertain the situation with regard to Bromwich and Hong's conditions concerning technology and input price behaviour.

If the requisite cost allocations are not made, such a study will still be required in order to ascertain whether the technology and input price conditions exist for a two stage costing system, in principle, to capture the avoidable cost of a particular product. If they do, then some sort of cost-benefit analysis is necessary to determine whether the (presumably simpler) approach taken is consistent with the profit maximisation assumption.

Drury and Tayles (2000) drawing on the earlier work of Cooper (1988) have identified the situational variables likely to affect an information cost–benefit calculus as being: size of firm, product diversity, cost structure (i.e. proportion of direct to indirect costs), competitive strategy (i.e. cost leadership versus differentiation), type of firm (i.e. manufacturing versus service) and competitive environment (i.e. degree of price competition).

For a given firm, it will probably not be possible to quantify the benefits of more accurate product cost information—even if it is possible to quantify the costs of providing it. Within a case study approach, however, it may be legitimate to make a subjective evaluation of whether the firm's position regarding the factors influencing an information cost–benefit calculus, is consistent with its approach to cost analysis for pricing decisions. For example, a large firm with a diverse product range, high overhead costs and faced with severe price competition, seems likely to obtain benefits

from accurate cost allocations that outweigh the costs of operating a relatively sophisticated costing system.

A potential problem could arise where the factors affecting the information cost–benefit calculus exert pressures in opposing directions. This may, for example, be the case where product diversity implies the need for a sophisticated approach to costing, while a competitive strategy based on differentiation rather than price implies that a simple approach would suffice. However, if all or at least most of the firm's situational variables exert pressure in the same direction, an overall evaluation might still be possible. Moreover, even where a conflict exists, some variables will logically override others. For example, a firm with a very low proportion of overhead costs that has a very diverse product range, may well be behaving in conformity with the profit maximisation assumption in not bothering to make accurate overhead cost allocations.

Where the technology and input price prerequisites identified by Bromwich and Hong are not satisfied, then it will not be possible for the regular costing system to determine avoidable cost. A special study of the incremental costs of each decision is still possible. However, where the non jointness and separability criteria are not met, the incremental cost of a particular product may be so small in relation to total cost, that it is not a suitable basis for regular pricing decisions. Also, as Kaplan (1989, pp. 13–14) has observed, special studies are not usually feasible where a large number of decisions is required.

5.2. *Case study research findings*

The results of a case study research programme investigating these issues would be relevant to an evaluation of competing theories of management accounting practice, such as those implied respectively by neoclassical and institutional economics. Ahmed and Scapens (2000) have suggested that an institutional economics framework may better explain actual management accounting practice than does a neoclassical one.

Hodgson (1988) has described the institutional economics developed by Veblen (1899), Commons (1924) and other institutional writers. In the face of complexity, uncertainty and information costs, rational optimising behaviour as postulated by neoclassical economics is not possible. Instead, behaviour is driven by custom and habit. These, in turn, are shaped by the framework of socio-economic institutions within which economic activity takes place.

Specific historical events that occur within the socio-economic institutional framework will have a major influence on the origin and persistence of the customs and habits that guide behaviour. Scapens (1994) has suggested that the institutional economics approach can be used to explain observed management accounting phenomena which apparently confound neoclassical orthodoxy. Ahmed and Scapens (2000) apply the institutional economics approach to explaining apparently irrational costing and pricing procedures.

These authors describe how cost accounting and pricing became institutionalised as a result of a historically specific set of circumstances, for example, the first World War and the resultant need for an agreed method for pricing government contracts.

Government contracting made it necessary to agree on what constituted the cost of a particular product or job, rather than being part of the general cost of being in business at all. Government accountants became heavily involved in defining what the constituents of cost should be and how they should be measured. The costing procedures specified reflected the accountants' traditional concern with the ex post recording and presentation of historical monetary outlays (and their allocation to a particular accounting period—the

matching principle—to facilitate profit measurement) rather than the economist's concern with optimal decision making. To the resultant cost figure was added a profit mark up which would give a fair return on capital employed.

Accountants thus defined what was meant by cost and this was not typically what an economist would recognise as an opportunity cost. The procedures thus established came to be accepted as standard by accountants working in the firms affected and gradually came to be accepted by other firms. Ahmed and Scapens also describe how the development of uniform costing systems by industry trade associations added further impetus to the contagion of financial accounting oriented costing and pricing procedures. Johnson and Kaplan (1987, pp. 134–141) describe how professional accounting institutions and university accounting departments further disseminated these procedures as part of the professional training of accountants and they thereby became more widespread.

6. Conclusion

The accounting literature seems to accept research findings, which are at variance with neoclassical assumptions and then attempts to rationalise this so-called reality gap. The mainstream economics literature, on the other hand, seems to accept the implicit marginalism hypothesis and thereby rejects a reality gap. Indeed both literatures appear to neglect the possible insights provided by the other. The accounting literature ignores the implicit marginalism and instrumentalism arguments of the economics literature, while the economics literature has tended to accept any evidence of incremental reasoning as equivalent to the full application of marginalist principles. It has also largely avoided any discussion of the difficulties of ascertaining avoidable cost and could benefit greatly from the insights provided by contributions to the accounting literature such as those on activity-based costing.

Neither accountants' nor economists' positions are justified on the basis of the conflicting empirical evidence. Further empirical research is warranted and Section 5 of this paper has identified a possible fruitful approach to such research. Research into the nature of the cost information used for pricing decisions may be useful in supporting or undermining neoclassical theory and thus suggesting the extent of any reality gap. To the extent that the research findings are inconsistent with neoclassical assumptions, they may serve to inform an alternative framework such as that of institutional economics. This would require identification of the origin of particular institutionalised accounting routines and explication of their meaning and significance to management—which account for their continuation.

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