

# **UNDERSTANDING RESOURCE CONSUMPTION AND COST BEHAVIOR PART I – THE BLENDED COST CONCEPT ERROR**

by

B. Douglas Clinton, CMA, CPA, Ph.D.  
Alta Via Consulting Professor of Management Accountancy  
Northern Illinois University

Anton van der Merwe  
Alta Via Consulting, LLC

July 3, 2008

Please address inquiries to: B. Douglas Clinton  
Department of Accountancy  
Barsema 345R  
Northern Illinois University  
DeKalb, Illinois 60115  
(815) 753-6804 office  
(815) 753-8515 FAX  
(815) 899-9373 home  
[Clinton@niu.edu](mailto:Clinton@niu.edu)

# **UNDERSTANDING RESOURCE CONSUMPTION AND COST BEHAVIOR PART I – THE BLENDED COST CONCEPT ERROR**

There are often passages in the management accounting (MA) literature that suggest we consider one modeling approach or another for decision making relevant to a specific time-frame (i.e., long-term, short-term, or something in-between). For example, some say we should use variable costing or the theory of constraints (TOC) for short-term decisions and activity based costing (ABC) for longer-term decisions. However, these recommendations are likely flawed from the start. There is a fundamental problem with taking this approach that needs to be recognized. At the heart of the issue is a proper understanding of consumption and cost behavior that has been misplaced.

In this two part series, we first take a closer look at this problem, its likely origins, and pitfalls. In the second paper in this series we propose an alternative approach to operational modeling intended to address the underlying issues that contribute to the problem. As MA approaches go, Resource Consumption Accounting (RCA) was created with the view of designing a better operational modeling approach that would maintain appropriate baseline *operations* information for decision support—whether in the short run, long run, or something in between. However, there are aspects of the problem we are about to highlight that cannot be solved regardless of the MA approach we choose to use, as we will explain in the second paper in this series.

## **The Blended Cost Concept Error**

In addressing the issues of decision making, whether in the short-term, intermediate, or long-term, to properly evaluate decision alternatives we must not first seek a particular MA

approach (e.g., traditional standard costing, ABC, TOC, etc.), but rather, a fundamental understanding of consumption and cost behavior *regardless* of the approaches we favor. The current and popular use of the economic/operating concepts of fixed and variable costs directly in decision analysis is inadequate for this purpose. This practice is referred to as the blended cost concept error and is committed by using *operational* cost concepts (i.e. fixed and variable) exclusively in decision support analysis. Instead, we need to use the *decision* cost concepts of avoidable and unavoidable costs in decision analysis. The sidebar displays how these two sets of concepts should be separated and that they are *not* interchangeable.

[Insert the sidebar about here.]

The blended cost concept error is likely the most widely committed error in MA—and both academics and practitioners fall into this trap.

At this point you *may* be telling yourself that these concepts are not new, and that this discussion is so fundamental that it has no place in a journal of this caliber. Indeed, this *basic* information more likely belongs in a sophomore-level accounting principles text. Unfortunately, frequent abuse and sloppy application of these terms by both academics and practitioners has necessitated this emphasis.

### **The Pervasiveness of the Blended Cost Concept Error**

The widespread nature of the error of trying to use operational concepts for decision making should not be surprising when we consider that accountants are, to a large degree, products of what professors and textbooks teach them. Even leading business books are inconsistent and regularly confuse the operational and decision support concepts. Will you find well-known definitions of relevance and variability in current texts? Certainly. Will you find these concepts *consistently* applied in those texts? In many cases, no. Unfortunately, in those

same introductory texts (and in the advanced ones as well)<sup>1</sup> you will find great inconsistencies that confuse students and violate the very rules suggested. Consider the following from

Horngren, Sundem, and Stratton's *Introduction to Management Accounting*, 13<sup>th</sup> Ed. (2005, 48).<sup>2</sup>

...we shall assume that we can classify every cost as either totally variable or totally fixed. We assume also that only one volume-related cost driver affects a given variable cost and that the relationship between the cost and the cost driver is linear.

Whether we classify costs as fixed or variable depends on the situation. More costs are fixed and fewer are variable when *decisions* for which we use the cost information involve very short time spans and very small changes in activity level. [*Italic emphasis added*]

In this passage where the operational cost concepts of variable and fixed are introduced, we see that the definitions are suggested as applying to both operations and to decision making. They go on to explain (inappropriately) in the following passage that:

This example underscores the importance of the *decision situation* itself in the analysis of cost behavior. Whether costs are really “fixed” depends heavily on the relevant range, the length of the planning period in question, and the *specific decision situation*. [*Italic emphasis added, (49)*]

At this point there is no clear distinction between operational cost concepts and decision cost concepts. More appropriately, the text should have used the word *unavoidable* instead of *fixed*. Several chapters later, avoidable costs are (appropriately) defined as “Costs that will not continue if an ongoing operation is changed or deleted (Horngren, et al. 2005, 209).” Unfortunately, as an example from practice, they then make the following statement: “For example, Amtrak divides its costs into avoidable—costs that ‘would cease if the route were eliminated’—and fixed—costs that would ‘remain relatively constant if a single route were discontinued. (Horngren, et al. 2005, 209).”

Remarkably, the four pages leading up to the definition of avoidable costs and its discussion include a section headed, “Confusion of Variable and Fixed Costs” that explains through a simple example that, “Only the relevant costs, in this case, the variable costs, would

---

<sup>1</sup> Note that the Horngren, et al. text is used merely as an example. Most management accounting texts of which the authors are aware suffer from the problems discussed here.

<sup>2</sup> Horngren, C. T., Sundem, G. L., and Stratton, W. O. (2005). *Introduction to Management Accounting*. Pearson Education, Inc.: Upper Saddle River, New Jersey.

change: parts and power. Fixed costs would be unaffected. (Horngren, et al. 2005, 206).” It is our opinion that such duality serves to confuse students by reinforcing the incorrect belief that variable costs are avoidable (and thus relevant), while fixed costs are not avoidable (and thus not relevant) to decisions.

The blended cost concept error also pervades MA business literature. Consider the following example from Cooper and Kaplan’s *Cost and Effect* (1998, 119):

Eli Goldratt, in his Theory of Constraints, has this limited concept of a variable cost exactly right. In most organizations, the only variable costs—those where spending would change based on accepting or rejecting an individual order—are the materials costs associated with the incremental order (and perhaps the energy cost to operate the machines to produce the order).

This example depicts the discussion of variable costs resulting because of a *decision* to accept or reject an individual order. What is meant by this passage—in more appropriate terms—is that the costs are *avoidable*, not variable. The phrase, “...the only variable costs—where spending would change...” violates a fundamental aspect of the definition of variable costs. That is, that variable costs are costs that *change*. This is of course not true. Traditional MA texts define variable costs as those that vary with *volume*. Fixed costs go up and down (e.g. utility bills vary with the seasons), but that does not make them variable costs.

If this situation were not confusing enough, many of the potentially relevant items to future decisions (e.g., opportunity costs) are not even present in companies’ decision support information. Anecdotally, the authors of the current article (an academic and a practitioner) will attest that we have both experienced countless frustrating conversations with both academics and practitioners that involve statements like, “Those items are fixed costs so they are irrelevant to the decision, right?”

## **Inconsistent Terminology**

In what seems like a case of adding insult to injury, various MA approaches further complicate the situation by insisting on their own interpretations of these cost concepts. Consider for example the Theory of Constraints using the terms ‘throughput expense,’ ‘truly variable cost,’ and ‘totally variable cost’ as synonyms. A prominent textbook even goes so far as to use the term ‘super variable cost’!<sup>3</sup> Ironically, these terms have very little to do with the embodiment of the principle of variability. However, they do imply an avoidable cost for throughput decisions within the relevant range.

Lean Accounting divides costs into variable costs on the one hand and period costs on the other. However, not everyone in the lean accounting community subscribes to this view. In fact, the term ‘fixed costs’ is frequently used (instead of the decision concept ‘unavoidable costs’) in decision support examples. If we add to this the fact that the determination of whether an operational cost is variable or fixed is often a very subjective endeavor, we have the potential for great distortions in both operational costing and decision making—as is the case currently in the profession.

Confused yet? Managers certainly have reason to be. How did the profession—in theory and in practice—manage to get to the point of ambiguous terminology and capricious application (that must often result in inappropriate decisions) as it has? We believe the answer to this question can be found in (1) management accounting’s economic roots, and (2) the use of a principle (variability), which no longer embodies 21<sup>st</sup> century business reality.

---

<sup>3</sup> Horngren, C., Foster, G. & Datar, S. 2000. *Cost Accounting: A Managerial Emphasis*. 10<sup>th</sup> Edition. Prentice-Hall Inc.: Upper Saddle River, NJ. P. 299.

## History and Economics

One of the keys to the mix up seems to be *time* and the history of where the cost concepts originate. MA appears to have borrowed the concepts of fixed and variable costs from economics. This may partially explain the importance of the CMA exam coverage on economics. However, these concepts must be properly understood within the context applied in MA. Economics deals with general principles and sweeping assumptions on a broad level for the purposes of equilibrium theory. The primary objective in economics is not to provide decision concepts for the practical use of managers in specific scenarios; this is the job of MA. Examples from a popular CMA review manual may help to explain the difference.<sup>4</sup>

Consider the following definitions:

Fixed costs – costs that do not change with the level of output: the costs of fixed resources.

Variable costs – costs that vary with output; the costs of variable resources (p. 35).

Here the economist provides definitions of cost behavior that are consistent with the operational cost concepts used in MA. Fundamentally, this produces no argument.

Now consider another statement:

In the short run, certain costs are fixed regardless of output. Given that fixed costs are incurred even if the firm shuts down, the firm gains in the short run by continuing to operate if revenues exceed variable costs (p. 32).

Compared to the initial definitions, this may at first appear to be a contradiction since fixed costs were initially defined in terms of outputs. However, the statement here is qualified by time.

Thus, in the MA vernacular, the economist is here using the term ‘fixed costs’ with an added time dimension to mean *unavoidable*. How do we know that? Because fixed cost was previously defined in relation to output and the statement is made here that the “costs are fixed *regardless of output*” (emphasis supplied). Without the management accountant’s understanding of the relation

---

<sup>4</sup> Quotations are taken from *Gleim’s CMA/CFM Review: Part 1*, 11<sup>th</sup> Ed. 2002. Gleim Publications, Inc.: Gainesville, FL. Similar definitions are common to other CMA/CFM review resources in the economics portion as well, and this is not intended to indicate here that they are inappropriate or incorrect.

of these concepts (i.e., fixed and unavoidable) to operations versus decision support, management accountants will continue to provide inadequate decision support information and incorrect guidance to managers.

Another statement regarding economic thought:

Because all inputs are variable in the long run, the relationship between input and output is dictated by the degree of returns to scale (p. 36).

Here the economist discusses the long run, and is clearly referring to *all* resources (and ultimately costs) as *avoidable* in that timeframe. Thus, for the economist *time* (as related to output) is the key element necessary to differentiate avoidable and unavoidable cost behavior when applying her concepts. Unfortunately, economics—dealing in generalities—does not make the explicit distinction between decision relevant concepts (avoidable and unavoidable) that is so important to MA.

This creates the issue, for the management accountant, of determining which variable costs and which fixed costs are relevant to a particular decision. Of course this problem is more clearly stated as the need to determine which costs are avoidable (and thus *relevant* to a particular decision) and unavoidable (and thus *not* relevant to the decision).

In practice this means the manager depends on two requirements being met:<sup>5</sup>

- Achieving reliability in operational cost assignment as baseline information that properly classifies costs as fixed and variable (with outputs) as they flow across the organization's value chain, and
- Scrutinizing costs as to how the decision at hand may determine their avoidable/unavoidable state.

We will examine the first requirement in more detail below when we discuss issues related to the principle of variability.

---

<sup>5</sup> The reasons for these will be discussed in more detail in the second paper in this series.

For the time being, assuming that the first requirement is met, this may raise a question. Why would further scrutiny be needed if somehow all fixed and variable relationships were properly captured in the operational model? The answer to this question has to do with the fact that the variable and fixed cost concepts are concerned with properly categorizing costs consistent with their definitions as related to output within the relevant range. That is, they do not possess the attributes of relevance that are specific to any particular decision—only to the principle of variability. Thus, no matter how we slice it, operational cost concepts alone—although important—are not adequate in supporting enterprise optimization.

Consider one more entry from economics:

[Assuming pure (perfect) competition], If price is less than average variable cost, the firm should shut down to minimize losses (p. 42).

This is an economic rule that accountants have done a poor job of applying to practice, particularly in light of the blended cost concept error. If we replace the term *variable* with the term *avoidable* the problem goes away—or does it? Unfortunately, even if we do that, the tendency toward simplicity in MA has suggested that we assume that all variable costs or with some methods just certain variable costs (i.e., such as direct materials) are the only costs that are *avoidable*. The issue here is that such assumptions do not tackle the two problems of (1) inaccurate operational cost assignment, and (2) the required scrutiny to consider the parameters of the decision itself, as mentioned earlier.

Moreover, the original economic rule is only reliable for environments of perfect competition—an assumption that is almost never absolutely true in practice. The rule is therefore inadequate and unreliable for *all* competitive environments. MA, once again, must fill in the gap. This is a fundamental reason why TOC and lean accounting are flawed in trying to optimize by a

different operational cost concept definition (e.g., truly variable costs) in decision optimization. This is an inappropriate and incomplete approach that only results in confusion.

One more point regarding this economic quote should be emphasized. Although the firm in this context “should shut down if price is less than average variable cost,” this statement should not imply that the converse is sufficient for enterprise optimization. That is, price exceeding average variable cost is merely a minimal starting point, not a doctrine for managing the business. For example, this economic rule does not imply that throughput (i.e., price less the cost of direct materials) is all we need to consider in making optimal decisions for the enterprise. This was tellingly demonstrated when some adopters of TOC and its ‘totally variable cost’ concept got themselves into unsustainable price wars with competitors.<sup>6</sup> In typical decision analysis there are an array of additional considerations that are necessary including all the resources to be committed and the consideration of potentially relevant fixed costs.

Although our focus has been on consumption and cost behavior, we would be remiss not to emphasize the fact that decision support includes more than merely the concept of avoidability. Opportunity cost is of course a concept that impacts decision relevance. Moreover, differential revenues should be considered since they are, in terms of our discussion, negative costs.

### **A Principles Problem**

Another series of articles that appeared in this journal went to great lengths to show that the problem in MA is one of a lack of overarching principles.<sup>7</sup> The theoretical, practical and terminology issues highlighted above are symptoms of this larger problem. The intent is not to

---

<sup>6</sup> Noreen, E, Smith, D & Mackey J. 1993. *The Theory of Constraints and Its Implications for Management Accounting*. The North River Press. Great Barrington, MA. p 17.

<sup>7</sup> Van der Merwe, A. 2007. The Management Accounting Philosophy series. *Cost Management*. A three part series appeared in the May/June, Sept/Oct and Nov/Dec issues. RAI Group. New York, NY.

revisit that discussion here, however, on the subject of resource consumption and cost behavior the principle of variability warrants further discussion if the topic is to be fully grasped.

Consider the following two scenarios that illustrate the traditional use of this principle in operations modeling and in decision support.

Scenario 1: A trucking company decides to replace its aging truck fleet with new trucks. This results in a significant reduction in the amount of maintenance required. The maintenance manager realizes that he can reduce his total maintenance capacity by 8,000 hours, the equivalent of a whole crew including the crew's supervisor. Thus the manager's avoidable costs are the wages of all the technicians in one crew (\$80,000 - ordinarily a variable operating cost) as well as the salary of the crew supervisor (\$35,000 - ordinarily an operational fixed cost). Hence, fixed and variable costs are avoidable.

Scenario 2: The same trucking company receives an offer from an outside vendor to take over the repair and overhaul of all truck alternators and starter motors. The manager knows from his MA system that the company spends 2,400 hours per year on these activities. A maintenance technician works 1,600 productive hours per year and the wages of one technician is therefore an avoidable cost (\$16,000 - ordinarily a variable operating cost). But the costs associated with the remaining 800 hours (2,400 hours that will no longer be required minus 1,600 hours for one technician that can be let go) is unavoidable costs (\$8,000 - ordinarily a variable operating cost) since 800 hours represents only half a resource - one technician would merely sit idle half his time. Moreover, the crew supervisor will be less busy but his salary is similarly unavoidable. The same fixed and variable salary costs are now unavoidable! Clearly, there are decision scenarios where fixed costs are avoidable. Likewise, there are decision scenarios where variable costs are unavoidable.

This traditional use of fixed and variable cost concepts is however no longer sufficient to fulfill the first requirement identified above (i.e., operational cost concepts that reflect accurate resource consumption). This is because in defining variability, traditional costing defines cost behavior as related to the ultimate cost objects' total volume. That is, variability is defined in relation to the final cost object (e.g., product) rather than as a more succinct association with a specific output (e.g., the support service output the cost is explicitly incurred for). Moreover, recent developments (e.g., ABC) have shown that the traditional definition of variability is inadequate even at the final cost object level (e.g., when producing fewer relatively more complex products total output volume is reduced but can still result in inversely higher total cost due to more and specialized activities for these complex products). Therefore, variability as a principle that must govern cost behavior has proven inadequate for 21<sup>st</sup> century enterprise modeling.

### **Is Operations Modeling even Necessary Anymore?**

At this point one is justified in taking a serious look at the need for operational cost modeling at all. The simplicity movement in MA—TOC and Lean Accounting—has been advocating an easy way out of traditional modeling. However, these approaches raise more questions than the answers they provide.<sup>8</sup> From a modeling perspective the issues with these approaches can be traced to the blended cost concept error—in particular, their attempts to model relevant costs as opposed to operational costs.

Companies however do not model unavoidable and avoidable costs in their MA systems. It is in fact impossible. The cost information that results from the application of decision cost concepts applies very specifically to every decision scenario. Moreover, very few if any of these

---

<sup>8</sup> Thompson, J. & Van der Merwe, A. 2007. "The Lowdown on Lean Accounting." *Strategic Finance*. February; Van der Merwe, A. 2008. "Debating the Principles: The Theory of Constraints and A Principle to Go the Distance." *Cost Management*. May/June.

decisions to be considered in the future are known at the time the cost model is constructed. Even if some decisions are known at the time the model is being built, how would the fact that the same costs (e.g. supervisor salary and technician wages) are avoidable in one scenario and unavoidable in the next be modeled? Thus, costs cannot be modeled based on decision cost concepts unless all future contingencies and their resolutions are known in advance and then only in an endless number of models. The difference between operational and decision concepts and the need to use them appropriately is crucial.

The importance of operations modeling and the operational cost concepts is further underscored by their extensive use for predictive purposes, performance measurement, sensitivity analysis, and the control of operations.

## **Conclusion**

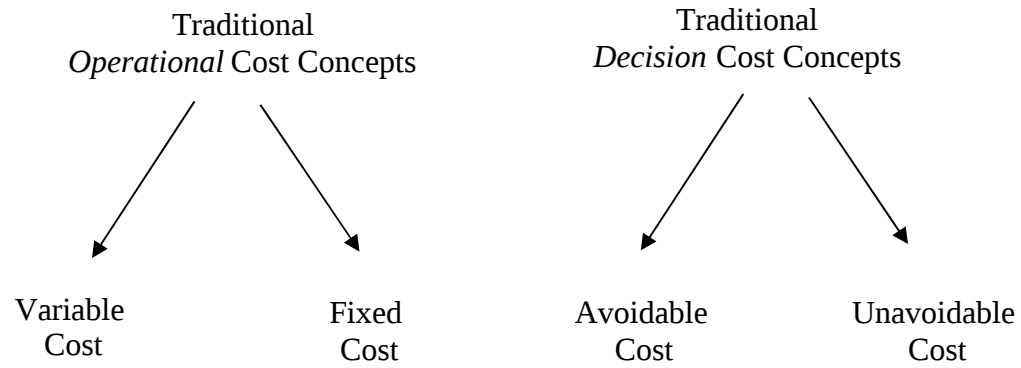
By clinging to the operational cost concepts of fixed and variable, and trying to use them exclusively for optimization, we instantly and severely limit our understanding of resource consumption that is relevant to the decision at hand. This causes accountants and managers to seek a particular MA approach or tool that, using *operational* cost concepts, models relevant costs specifically as they relate to the particular decision being made. When we do this, we find ourselves on a slippery slope.

Instead, by using decision concepts one is able to avoid the complication of having to deal with the dual aspects of both outputs and time (as an additional qualifier) in operational cost concepts. With the terms avoidable and unavoidable, the rule is reliable and determined based on the unique timeframe of each respective decision. The truth that is reflected in cost behavior (but not necessarily our costing systems) is that there is a wide range of change in outputs associated with decisions. We encounter everything from small changes in cash flows (e.g. direct material

when producing one less unit), to a countless number of levels of step-fixed costs, to the ultimate realization that all costs are *avoidable* with outputs at some level (e.g., when deciding to go out of business). Accordingly, we must stop the madness of migrating from one costing tool to another (all of which inconsistently apply an antiquated principle) for decision making in differing timeframes when avoidability is unique to each individual decision.

The next paper in this series will introduce the Resource Consumption Accounting (RCA) answers to the issues raised. This will include a more detailed discussion on the importance of operational cost concepts and an explanation how they provide a necessary basis for determining relevant costs. The divergence of operational and decision cost concepts is also discussed further. Moreover, we discuss the principle RCA proposes as a replacement for variability, what this means for understanding input-output relationships for managers, and the task of optimization. We also cast an eye towards the future, in particular with regard to two important developments in other disciplines that seem set to demand more advanced modeling practices of the MA profession.

**Sidebar**  
**Traditional Cost Concepts**



Note: Variable Cost  $\neq$  Avoidable Cost  
- And -  
Fixed Cost  $\neq$  Unavoidable Cost