

Strategic Management Accounting and Control

Rajiv D. Banker
Ashbel Smith Chair in Accounting and Information Management
The University of Texas at Dallas
Richardson, TX 75083-0688 USA

Holly H. Johnston
Assistant Professor of Accounting
Babson College
Babson Park, MA 02457-0310 USA

Abstract

This paper discusses the design characteristics management accounting systems should have to be useful for strategic planning and control and provides brief introductions to strategic variance analysis and profit-linked performance measurement models. It shows two multi-period, multi-product models (Banker, Chang and Majumdar 1993; Banker and Johnston 1989) are specified, can be related to Porter's (1980, 1985, 1991, 1996) strategy framework and cost and revenue drivers, and can be used to support strategic planning, control and cost management.

1. Introduction

As business environments have become increasingly dynamic and competitive, it has become increasingly important for managers to develop coherent, internally and logically consistent business strategies and to have tools and models which provide useful information to support strategic decision-making, planning and control. In response to these needs, there have been many important developments, in both management accounting research and practice, that focus on the use of accounting data and related information regarding strategy and operations for these purposes. Some of the most important developments in *strategic planning and control* have been: (i) the *balanced scorecard*, a comprehensive set of performance measures designed to assist managers in implementing competitive strategies and monitoring performance with respect to them (see Kaplan and Norton 2000), (ii) *strategic variance/profitability analysis*¹, systems which decompose measures of budgeted versus actual net income into variances which managers can relate logically to a firm's or *strategic business unit's*² (*SBU's*) mission and business strategy and therefore use to analyze performance from a strategic

perspective (Shank and Govindarajan 1993; Simons 2000), (iii) *profit-linked performance measurement systems*, models which decompose measures of changes in profitability over time into measures of changes in constructs such as productivity and price recovery, which can be logically linked to a firm's/SBU's mission and business strategy and analyzed from those perspectives (American Productivity Center (APC; now the American Productivity and Quality Center) 1981; Banker, Chang and Majumdar 1993; Banker, Datar and Kaplan 1989; Banker and Johnston 1989), and (iv) *levers of control*, a comprehensive framework for organizing and employing management control systems to promote strategic objectives (see Simons 2000).

This paper: (i) discusses characteristics management accounting information systems should have to be useful for strategic planning and control, in the context of Porter's (1980, 1985, 1991, 1996) strategy framework (Section 2), (ii) briefly introduces strategic variance analysis (Section 3), and (iii) provides a more substantial introduction to profit-linked performance measurement systems, so we can show how two models are specified and used in some detail (Section 4). Since the balanced scorecardⁱⁱⁱ is widely discussed elsewhere, and Simons' (2000) framework encompasses all management control systems and focuses on how managers should integrate and use the systems, we just mention them here. Section 4 shows how the measures in the Banker and Johnston (1989) and Banker, Chang and Majumdar (1993) multi-product, multi-period models^{iv} can be related to Porter's framework, *critical success factors*^v, and strategic operating choice variables (cost and revenue drivers), drawing on an analysis of U.S. airlines following deregulation. It also discusses ways the models can be used for strategic planning, control and cost management.

2. The Design of Strategic Cost Management and Control Systems

If management accounting information systems are to be useful for *strategic* purposes, that is, to help managers increase the likelihood that they can achieve their strategic goals and objectives, their designs and use must follow from firms' missions and competitive strategies. In Porter's framework, strategy should follow from an analysis of the determinants of the nature and intensity of competition: the firm's/SBU's bargaining over its consumers and suppliers, threats from new entrants and substitute products (barriers to entry and exit), and the intensity of rivalry in product markets. To generate a

sustainable competitive advantage, a strategy must: (i) establish a unique market position based on low cost leadership, product differentiation, or a workable combination of the two, with an appropriate scope of markets (broad or focused/niche); (ii) be differentiated from competitors' strategies, through unique product variety, ability to satisfy customer needs, and/or access to particular customer segments; and (iii) employ chains of complementary, value-adding activities which are difficult for competitors to replicate.^{vi} The chosen strategy, in turn: (i) determines the SBU's critical success factors, such as delivering superior product and service quality and achieving high price recovery for SBUs pursuing differentiation strategies, or achieving economies of scale, improving productivity and delivering threshold product and service quality at low prices for SBUs pursuing low cost leadership strategies, and (ii) informs choices regarding the design of products and configuration of operations which drive costs and revenues. For a set of performance measures to exhibit *content validity* in a strategic context, then, it must measure constructs related to the mission and strategic framework, the selected strategies, the firm's/SBUs' critical success factors, and operating choice variables.

In addition, the constructs, and their measures, must be causally linked. Performance measurement systems should explicitly incorporate models of profit-generating processes, so, when managers take actions the models suggest will improve performance along one or more dimensions, the intended improvements are likely to materialize. Thus, the models should incorporate relationships over time as well as contemporaneous relationships and linkages capturing cause-and-effect relationships between constructs and measures of performance throughout the firm (horizontally and vertically; aggregated to disaggregated; across the entire value chain). Finally, the measures should also have 'good' theoretical and empirical measurement properties (see, for example, Johnston and Banker 2000a,b).

3. Strategic Variance Analysis

Shank and Govindarajan (1993) decompose profit variances into mutually exclusive, collectively exhaustive sets of variances which capture the separate impacts of key underlying causal factors, for example, deviations between actual and budgeted sales volumes and mixes, market sizes and shares, manufacturing costs, contribution margins, and discretionary costs. Conceptualizing *mission* in terms of *profitability* and a *build, hold* or *harvest* perspective and *strategy* in terms of *low cost leadership* or

product differentiation, Shank and Govindarajan show that, by analyzing the variances with explicit reference to a firm's/SBU's mission and business strategy, they can determine the extent to which deviations between actual and budgeted performance are or are not consistent with the mission and strategy and identify specific dimensions of performance which need improvement. Analyzing the variances without reference to mission and strategy can be uninformative or misleading.

Simons (2000) decomposes profit variances into *effectiveness variances* (market size, market share, selling prices, and product volume and mix variances) and *efficiency variances* (materials and labor price and efficiency, discretionary and committed cost spending variances, and/or activity-based cost variances). Simons points out that effectiveness variances are of particular importance to business units pursuing differentiation strategies and efficiency variances to units pursuing low cost, high volume strategies.

4. Profit-linked Performance Measurement Systems

Profit-linked models decompose measures of return-on-investment and net income into measures of productivity, price recovery, capacity utilization, and other managerially relevant dimensions of performance. Practitioners led the development efforts, with models which decompose measures of profitability into measures of productivity and price recovery (APC 1981; Miller 1984, 1987). Academics have contributed by refining and extending the models from the perspectives of management accounting, business strategy and the economic theory of production, showing how the models can be used to analyze cross-sectional differences and time-series changes in performance in the context of changing competitive environments and strategies, and examining the measures' mathematical, economic and empirical properties (see, for example: Banker, Chang and Majumdar 1993, 1996; Banker, Datar and Kaplan 1989; Banker and Johnston 1989; Grifell-Tatjé and Lovell 1999; Johnston and Banker 2000a,b).

4.1. Model Specification

Banker and Johnston (1989) and Banker, Chang and Majumdar (1993) define a *measure of relative profitability*^{vii} as the ratio of two *total factor productivity indices*, one for the period of interest t and one for the benchmark or base period 0:

$$PFTBLT_t = \frac{\sum_m p_m^t y_m^t / (\sum_v w_v^t x_v^t + \sum_f w_f^t x_f^t)}{\sum_m p_m^0 y_m^0 / (\sum_v w_v^0 x_v^0 + \sum_f w_f^0 x_f^0)} \quad (1)$$

where:

y_m^t = actual quantity of output m sold during period t , $m=1,2,\dots,M$, $t=0,1,2,\dots,T$,

p_m^t = selling price per unit of output m ,

x_v^t = actual quantity of variable cost input v employed, $v=1,2,\dots,V$,

w_v^t = price per unit of variable cost input v ,

x_f^t = actual quantity of fixed cost input f employed, $f=1,2,\dots,F$, and

w_f^t = price per unit of fixed cost input f .

For empirical analyses, the benchmark prices and quantities may be defined according to an organization's performance during a suitable time period, the organization's average performance over several periods, or the performance of a set of close competitors, depending on the objective of the application and implications for interpretation. (For the analyses discussed below, we defined the benchmarks as averages across ten U.S. airlines and twenty quarters from 1981Q1 (first quarter) to 1985Q4.)

The models are based on assumptions consistent with standard cost accounting, that, in the short to medium run, the production technology can be characterized as a *fixed proportions technology* with input functions that can be approximated linearly within relevant ranges by *standard quantities*. Standard quantities for each input, based on quantities required to produce one unit of actual output (or output capacity), are denoted by:

z_v = standard quantity of variable cost input v , for all actual outputs y_m^t , $m=1,2,\dots,M$,

z_f = standard quantity of fixed cost input f , given all output capacities k_m , $m=1,\dots,M$, for dedicated processes (Banker and Johnston 1989) or a common capacity k (Banker, Chang and Majumdar 1993), and

q_f^t = standard quantity of fixed cost input f , given standard capacity utilization rate(s) and all actual outputs y_m^t .

For empirical analyses, the standards may be specified, as in standard costing systems, to reflect engineering or managerially determined benchmarks, or defined with respect to an estimated production frontier (see, for example, Grifell-Tatjé and Lovell 1999).

*PFTBLT*_{*t*} factors into four measures: (i) a *productivity change ratio (PRDTV_T)*, due to changes in the use of variable and fixed cost inputs relative to standards, given actual outputs and capacities, (ii) a *capacity utilization change ratio (CAPUTL)*, due to changes in deviations between actual outputs and capacities, (iii) an *output mix change ratio (OUTMIX)*, due to changes in the volumes and mix of actual outputs, and (iv) a *price recovery change ratio (PRCREC)*, due to changes in output and input prices.

The measures are defined as:

$$PRDTV_t = \frac{(\sum_v w'_v z'_v + \sum_r w'_r z'_r) / (\sum_v w'_v x'_v + \sum_r w'_r x'_r)}{(\sum_v w^o_v z^o_v + \sum_r w^o_r z^o_r) / (\sum_v w^o_v x^o_v + \sum_r w^o_r x^o_r)} \quad (2)$$

$$CAPUTL = \frac{(\sum_v w^o_v z'_v + \sum_r w^o_r q'_r) / (\sum_v w^o_v z_v + \sum_r w^o_r z_r)}{(\sum_v w^o_v z^o_v + \sum_r w^o_r q^o_r) / (\sum_v w^o_v z^o_v + \sum_r w^o_r z^o_r)} \quad (3)$$

$$OUTMIX = \frac{\sum_m p^o_m y'_m / \sum_m p^o_m y^o_m}{(\sum_v w^o_v z'_v + \sum_r w^o_r q'_r) / (\sum_v w^o_v z_v + \sum_r w^o_r z_r)} \quad (4)$$

$$PRCREC = \frac{\sum_m p'_m y'_m / \sum_m p^o_m y^o_m}{(\sum_v w'_v z'_v + \sum_r w'_r z'_r) / (\sum_v w^o_v z_v + \sum_r w^o_r z_r)} \quad (5)$$

The ratios are constructed so their values are driven solely by deviations between relevant variables within and between time periods – by either exogenous variables that managers must take into account in making decisions or endogenous variables that managers choose. As a result, their values move in directions that reflect actions managers must take to improve performance.

4.2. Theoretical and Empirical Relationships between the Measures, Porter's Framework, and Operating Choice Variables

In Porter's framework, to achieve a competitive advantage, a firm/SBU must devise a strategy to defend against, or take advantage of, the structural determinants of the nature and intensity of

competition. The levels and time-paths of the ratios reflect outcomes of managers' efforts to exploit sources of bargaining power over consumers and suppliers and to reduce threats from new entrants and substitutes, as well as the intensity of competition. Emphases on improvements in productivity and capacity utilization, shifts in product mix toward products with lower unit costs, and low price recovery are consistent with low cost strategies. Less emphasis on productivity and capacity utilization, changes in product mix which may be more costly but serve less price sensitive consumers, and higher price recovery are consistent with differentiation. These relationships are fairly general and should hold for any industry or SBU.

Operating choice variables (structural and executional cost and revenue drivers; see, for example, Shank and Govindarajan 1993), and their relationships to the ratios, are conceptually similar across industries but often industry-specific in terms of measurement. Within industries, the design of each SBU's products differs, depending upon the SBU's particular customer and market orientation – and the configuration and characteristics of each SBU's operations should differ accordingly. To develop a schema of relationships for airlines, we (Johnston and Banker 2000b) searched three business databases for statements by airline industry and firm representatives and analysts related to the dimensions of competition posited by Porter (1980, 1985), the constructs captured by the ratios, and industry-specific operating choice variables, such as hub concentration and service quality. We found substantial differences in the extent to which carriers sought to exert power over consumers, by establishing local monopoly power or providing superior service, and to exert power over labor. Some carriers had route structures that were vulnerable to new entrants and substitute forms of transportation; others established 'no-frills' service and low cost subsidiaries and competed aggressively on fares. We used the schema to rank carriers along a continuum between low cost leadership and extreme differentiation. This ranking and two others based on analyses of the ratios alone were very highly correlated.

To show how a formal model of the associations between the ratios and operating choice variables could be developed and estimated, we regressed the ratios on measures of three operating characteristics (hub concentration, stage length, service quality) and variables to capture the impact of events such as strikes. The coefficient estimates provided estimates of the simultaneous impacts of small

changes in the operating choice variables and events on the ratios. For example, carriers with competitive hubs had significant gains in *PRDTV*T and *CAPUTL* which were almost completely offset by losses in *PRCREC* and *OUTMIX*, so the net impact on *PFTBLT* was insignificant. Carriers that dominated their hubs had higher gains in *CAPUTL*, lower losses in *PRCREC* and *OUTMIX*, and a significant positive net impact on *PFTBLT*.

4.3. Cross-sectional Differences and Time-series Changes in Relation to Porter's (1980, 1985) Strategies, Operating Choice Variables and Events

We also analyzed the time-paths of the ratios (see Figure 1 for Continental Airlines) and used differences in the levels of the ratios and movements over time to categorize and rank carriers' strategies. In response to deregulation, competition increased, and all of the carriers had increasing *PRDTV*T ratios and decreasing *PRCREC*. However, carriers primarily realizing differentiation strategies had relatively high *PRCREC* and low *PRDTV*T. Carriers primarily realizing low cost strategies had high *PRDTV*T and low *PRCREC*. To investigate the measures' ability to track adjustments and changes in strategies on a period-by-period basis, we conducted an analysis in which we sought to relate dated information in the statements to cross-sectional differences in the levels of the ratios and trends, step increases and decreases, and short-term, temporary increases and decreases in the ratios. The following discussion for Continental, condensed from Johnston and Banker (2000b), shows how the ratios can capture the effects of incremental and dramatic changes in strategy.

[Insert Figure 1 about here.]

Continental entered deregulation as a relatively high-cost, moderate-quality carrier, reducing costs but without much emphasis on exploiting bargaining power over labor, realigning its network into a hub-and-spoke system, or maintaining fare levels. As a result, its *PRCREC* was slightly above the sample average, *PRDTV*T was below average and increasing, and *CAPUTL* was low. When Frank Lorenzo took over Continental in October 1981, he immediately began to pursue a low cost leadership strategy, in manners reflected in increasing *PRDTV*T, *OUTMIX* and *CAPUTL* and declining *PRCREC*. The strategy included hub efficiencies, high productivity, low fares, and aggressive efforts to exploit bargaining power over suppliers. During this period, *PRDTV*T increased, but

labor-management problems led to strikes by mechanics in August 1983 and pilots and flight attendants in October 1983. In September 1983, Lorenzo filed for bankruptcy protection, eliminated nearly two-thirds of Continental's employees, reduces wages and salaries by nearly 50%, cut benefits, and imposed work rules to increase productivity. *PRDTV* did not decrease much during the mechanics' strike because Lorenzo hired replacement labor and continued operations at 85% to 93% of normal levels. The pilot and flight attendant strikes and bankruptcy proceedings are reflected in a sharp decrease in *PRDTV*, as Continental maintained less than 80% of normal services. In January 1984 Continental emerged from bankruptcy as a low cost carrier, with above-average, increasing *PRDTV* and *CAPUTL* and below-average, decreasing *PRCREC*. Although there were claims that Continental was improving service quality during this period, Continental had the poorest record of complaints in our sample. Finally, Continental expanded and threatened competitors aggressively. Lorenzo repeatedly initiated changes which increased the intensity of competition.

4.4. Applications for Strategic Planning and Control

The values of profit-linked performance measures are driven by variables that managers must take as given when making decisions or variables that reflect actions managers must take to improve performance – and they can be systematically linked to constructs and measures involved in business strategies, critical success factors, and product and process design. As a result, the models can be useful for formulating strategies, evaluating realized strategies relative to planned strategies, and evaluating the impacts of related managerial decisions. Managers can use the models to examine the impacts of strategic choices and events on each component dimension of performance, understand the trade-offs involved more clearly, and therefore devise more coherent, internally consistent combinations of strategies and tactics.

Once managers have specified and estimated a model for their specific context, they can use it to facilitate strategy formulation and implementation, and to support an on-going, evolutionary process of motivating and monitoring progress toward strategic goals and objectives and adapting choices in response to feedback obtained (continuous improvement). Prior to choosing new strategies, managers can analyze the time-paths of the component measures and operating choice variables, computed with

historical data, in conjunction with information regarding past intended strategies, events, distinctive competencies, and weaknesses, to evaluate the effectiveness of past strategies. They can determine the extent to which they have been achieving a low cost or differentiation strategy (whether explicitly formulated and intended or not), or a combination of the two, and dimensions along which performance has and has not been consistent with those strategies. The model can also be used for simulation and sensitivity analysis, to identify feasible alternative strategies and project the time-paths of the ratios and operating variables required to implement each successfully. During implementation, managers can monitor the values of the ratios and operating choice variables over time, relative to projected targets or benchmarks, to determine the extent to which they are achieving their objectives. The measures can be employed in responsibility accounting systems, to orient performance measurement and evaluation around achieving critical success factors and strategic objectives and to motivate and reinforce behavior on the part of managers which is congruent with strategic goals.

Since the ratios' values are mathematically related and anchored around one (1), the measures can be used to compare the performance of SBUs – particularly to evaluate SBUs that perform similar functions or pursue common strategies (for example, a subset of SBUs engaged in manufacturing and pursuing low cost strategies or a subset pursuing differentiation strategies in related niche markets). Cross-sectional, time-series analyses (between firms within given industries) of U.S. airlines and telecommunications firms and Spanish banks, in the context of deregulation, have yielded intuitively appealing and logically consistent substantive results (Banker, Chang and Majumdar 1993, 1996; Grifell-Tatjé and Lovell 1999; Johnston and Banker 2000b). Similar analyses could be conducted for SBUs within a given firm. If the SBUs share a common production technology, the input standards could be defined according to best practice.

Responsibility for aggregate measures can be assigned to SBU managers with responsibility for implementing and revising strategy, for monitoring and explaining actual results relative to the intended strategy. Responsibility for component measures can be assigned to individuals and teams who are responsible for improving the relevant dimensions of performance and making and explaining changes in particular product and process design variables. For example, *PRDTV* is a weighted average of

measures of changes in partial productivity (productivity by input as opposed to total factor productivity). Therefore, responsibility for individual partial productivity measures can be assigned to the relevant supervisors or plant teams. *PRCREC* can be expressed as a weighted average of changes in price recovery by product, so responsibility for changes by product can be assigned to product line managers and evaluated with respect to the strategy selected for each product (low cost leadership or differentiation).

4.5. Extensions for Strategic Cost Management

The design and use of strategic cost management systems are oriented around the application of three basic tools: cost and revenue driver analysis, value chain analysis, and strategic positioning analysis (see, for example, Shank and Govindarajan 1993). Important developments during the past two decades include activity-based costing and management, target costing, life-cycle costing, customer profitability and value analysis, and models for measuring and managing quality, environmental and capacity costs. These systems are designed to provide managers with relevant, accurate and timely information, by highlighting previously hidden costs, related nonfinancial data and inherent trade-offs between cost categories, so managers can identify opportunities for improvement, weigh trade-offs, set priorities, and take actions to reduce costs and increase revenues which are consistent with intended strategies. Profit-linked models can be refined in many ways to make them more useful for strategic cost management.

For example, the measures can be decomposed further. *PRDTV* and *CAPUTL* can be decomposed into measures of pure technical change (innovation entailing changes in structural cost drivers, and revenue drivers when they involve simultaneous improvements in product quality) and changes in technical and allocative efficiency (executional cost drivers), using methods along the lines employed by Grifell-Tatjé and Lovell (1999) (research in progress). *OUTMIX* captures the impacts of changes in economies of scale (an important structural driver). By adding a term for the minimum efficient scale size, for technologies with increasing returns-to-scale, or for the optimal scale, for technologies with increasing, constant and decreasing returns, we should be able to disentangle the effects of scale efficiency from the effects of changes in product mix (research in progress). By

introducing variables for market size and share, along lines employed by Shank and Govindarajan (1993), we should be able to disentangle their effects from those of changes in product mix.

Also, costs are currently separated into variable and fixed costs, and aggregated by function in the illustrative analyses in Banker and Johnston (1989, 2000b) and Banker, Chang and Majumdar (1993, 1996). But they can be organized and indexed by stages of the value chain and be more finely grained. For functions or stages of the value chain where activity-based costing and management would be useful, costs can be categorized according to the relevant cost hierarchies (unit-, batch-, product-sustaining-, customer-sustaining-, channel-sustaining-, and facilities-/organization-sustaining-level costs), and denominator volumes computed at practical capacity (Cooper and Kaplan 1999), so *PRDTVT* and other ratios can be disaggregated accordingly. For functions or stages of the value chain where capacity cost measurement and management is useful, the relevant output capacities K_m and inputs can be indexed according to a framework such as the Consortium for Advanced Manufacturing - International model (Klammer 1996), so the relevant portions of *CAPUTL* can be decomposed accordingly.

References

- American Productivity Center, Total Performance Measurement*, American Productivity Center, Houston, TX USA, 1981.
- Banker, R. D., H. Chang, and S. K. Majumdar, "Analyzing the Underlying Dimensions of Firm Profitability", *Managerial and Decision Economics*, 14(1) (1993), 25-36.
- Banker, R. D., H. Chang, and S. K. Majumdar, "A Framework for Analyzing Changes in Strategic Performance", *Strategic Management Journal*, 17(9) (1996), 693-712.
- Banker, R. D., S. M. Datar and R. S. Kaplan, "Productivity Measurement and Management Accounting", *Journal of Accounting, Auditing and Finance*, 4(4) (1989), 528-554.
- Banker, R. D., and H. H. Johnston, "Strategic Profitability Ratio Analysis: An Application to the U.S. Airline Industry Following Deregulation", Working Paper, Carnegie Mellon University, 1989.
- Cooper, R., and R. S. Kaplan, *The Design of Cost Management Systems: Text and Cases*, Second Edition, Prentice Hall, Upper Saddle River, NJ USA, 1999.
- Grifell-Tatjé, E., and C. A. K. Lovell, "Profits and Productivity", *Management Science*, 45(9) (September 1999), 1177-1193.
- Hornigren, C. T., G. Foster, and S. M. Datar, *Cost Accounting: A Managerial Emphasis*, 10th Edition,

Prentice Hall, Upper Saddle River, NJ USA, 2000.

Johnston, H. H., and R. D. Banker, "Economic Justification for the Use of Profit-linked Performance Measures in Research and Practice", Working Paper, September 2000a.

Johnston, H. H., and R. D. Banker, "The Validity of Profit-linked Performance Measures as Indicators of Low Cost and Product Differentiation Strategies: Empirical Evidence from U.S. Airlines following Deregulation", Working Paper, October 2000b.

Kaplan, R. S., and D. P. Norton, *The Strategy-focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment*, Harvard Business School Press, Boston, MA USA, 2000.

Klammer, T., Editor, The CAM-I Capacity Interest Group, *Capacity Measurement and Improvement*, Irwin Professional Publishing, Chicago IL USA, 1996.

Miller, D. M., "Analyzing Total Factor Productivity with ROI as a Criterion", *Management Science*, 33(11) (November 1987), 1501-1505.

Miller, D. M., "Profitability = Productivity + Price Recovery", *Harvard Business Review*, 3 (May-June 1984), 145-153.

Porter, M. E., *Competitive Advantage: Creating and Sustaining Superior Performance*, The Free Press, New York, NY USA, 1985.

Porter, M. E., *Competitive Strategy: Techniques for Analyzing Industries and Competitors*, The Free Press, New York, NY USA, 1980.

Porter, M. E., "Towards a Dynamic Theory of Strategy", *Strategic Management Journal*, 12 (Winter Special Issue 1991), 95-117.

Porter, M. E., "What Is Strategy?", *Harvard Business Review*, 74(6) (November-December 1996), 61-79.

Shank, J. K., and V. Govindarajan, *Strategic Cost Management: The New Tool for Competitive Advantage*, The Free Press, New York, NY USA, 1993.

Simons, R., *Performance Measurement and Control Systems for Implementing Strategy: Text and Cases*, Prentice Hall, Upper Saddle River, NJ USA, 2000.

Figure 1. Measures Illustrating a Change to Low Cost Leadership: Continental

i. Shank and Govindarajan (1993) use 'profit variance analysis', and Simons (2000) 'strategic profitability analysis', to describe their systems for analyzing budget variances. Horngren, Foster and Datar (2000) use 'strategic profitability analysis' in reference to the Banker, Datar and Kaplan (1989) model, and Banker and Johnston (1989) 'strategic profitability ratio analysis', for models which decompose measures of changes in profitability over time.

ii. A *strategic business unit* is a defined segment of a business whose mission and operations are critically important to achieving the strategic goals and objectives of the overall business.

iii. Balanced scorecard performance measures are typically taken from financial, customer, internal processes, and learning and growth perspectives. It has several particularly useful characteristics, including the specification of measures explicitly linked to mission and strategy, inclusion of measures which are indicators of future performance, particularly measures of innovation in operations and of learning and growth, and modelling of cause-and-effect relationships, between and within perspectives, which constitute the profit-generating process.

iv. The Banker and Johnston (1989) model is designed for processes in which each product has its own dedicated productive capacity. The Banker, Chang and Majumdar (1993) model is designed for processes in which a single, common capacity is used for all products.

v. *Critical success factors* are specific objectives that an SBU must accomplish to achieve its mission and intended strategy.

vi. The *value chain* is the linked set of value-creating activities, from raw materials acquisition to the completion of finished consumption goods and post-sales service, in which a firm/SBU is involved (Shank and Govindarajan 1993). It includes the activities in which the firm itself is engaged, the internal value chain, and the activities in which its suppliers and customers are involved, the extended value chain.

vii. Measures of profitability can be nested into expressions for return-on-investment via DuPont analysis, decomposing the measure of return into profit margin and investment turnover ratios (see, for example: Banker, Chang and Majumdar 1993, 1996; Miller 1987). Profit-linked decompositions were originally introduced as alternatives or complements to extended DuPont analyses (see, for example, Banker, Datar and Kaplan 1989).