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Costing Systems

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1 Introduction 3

Part 1 Production of Cost Information 9

2 Techniques to produce cost information 10
   2.1 Traditional costing systems 12
   2.2 Activity-based costing systems 14
   2.3 Resource consumption accounting 17
   2.4 Time-driven costing systems 19

3 Errors in costing systems 24
   3.1 Even advanced costing systems contain error 24
   3.2 How can we improve costing techniques? 28
   3.3 Production environment affects costing errors 30

4 Important remaining questions on errors in costing systems 32
   4.1 More realistic true production functions 33
   4.2 Updating of costing systems 36
   4.3 A life cycle approach to costing system properties 38
Part 2  Demands for Costing Systems 40

5  Decision-making demands for costing systems: general takeaways 42
   5.1  Measurement object and which resource costs to include for decision-making 42
   5.2  Short run and long run decisions 44
   5.3  Desirable properties of costing information for decision-making 45

6  Capacity acquisition, allocation and pricing decision demands for costing systems 48
   6.1  Measurement object and which resource costs to include for the capacity acquisition, allocation and pricing decision 48
   6.2  Desirable properties of costing information for the capacity acquisition, allocation and pricing decision 54

7  Other decision contexts’ demands for costing systems 58
   7.1  Customer profitability analysis 58
   7.2  Inventory management decisions 63
   7.3  Competition management decisions: desirable properties of costing information 64

8  Identification of cost management opportunities 67
   8.1  Measurement object and which resource costs to include for identification of cost management opportunities 67
   8.2  Desirable properties of costing information for identification of cost management opportunities 70
   8.3  Interorganizational cost management 72
   8.4  Cost management in the design of products and target costing 73

9  Inventory valuation for financial and tax accounting 76
   9.1  Measurement object and which resource costs to include for inventory valuation 76
   9.2  Desirable properties of costing information for inventory valuation 76
10 Performance measurement and control demand for costing systems
10.1 Measurement object and which resource costs to include for performance measurement and control
10.2 Desirable properties of costing information for performance measurement and control
10.3 Deliberate misallocation to circumvent performance measurement and control

Part 3 Interactions and Conflicts Between Sources of Demand for Cost Information and Implications for Costing System Design

11 Interactions and conflicts between sources of demand for cost information
11.1 Conflicts
11.2 Interactions

12 Interactions and conflicts between demands on cost information for performance evaluation and decision-making
12.1 Conflicts
12.2 Interactions

13 Transfer pricing: Interactions and conflicts between tax reporting and managerial accounting demands on cost information
13.1 Conflicts
13.2 Interactions

14 Conflicts and interactions between demands for cost information for inventory valuation, management and control
14.1 Conflicts
14.2 Interactions
15 Conclusion 108
Acknowledgements 110
References 111
ABSTRACT
This monograph provides a structured overview of costing system research that can explain the variation in the characteristics and properties of costing systems found in practice based on firms’ source(s) of their demand for cost information. Costing systems are not developed in a vacuum but are designed to fulfill a purpose. In order to have a meaningful decision on the various demands for cost information, I start in Part 1 by exploring the different techniques firms can use to supply cost information to its managers and employees. Next, I discuss how even the most advanced costing systems will contain error, and present research on how the production environment affects this costing error and what firms can do to reduce the error, outlining important avenues for future research. Part 2 then moves onto the sources of the demands for cost information. I first discuss the decision-making objective of costing systems, and the requirements it places on the preferred measurement object, which resources to include in the cost measurement, and the desired properties of the costing system. The most voluminous literature here is on the capacity acquisition and allocation decision problem, but I cover the demands on costing systems to support customer portfolio decisions, inventory management decisions and decisions on managing competition as well. This part also explores the demands for costing systems for the identification of cost management
opportunities and inventory valuation to support financial and tax accounting in a chapter each. Part 2 concludes with a chapter on cost information supporting performance measurement and control, again with respect to the preferred measurement object, which resources to include and the costing system’s preferred properties. Part 3 develops on the conflicting demands placed on costing systems by firms’ attempts at designing costing systems that serve multiple purposes. Furthermore, this part also discusses the nature of the strategic interactions between those different demands.

**Keywords:** costing systems; cost systems; managerial accounting system; cost system design; cost information.
Introduction

Costing information is used in a myriad of organizational and managerial settings to make decisions, manage costs, value inventory and/or evaluate performance. Virtually all companies use some shape or form of costing systems to support these objectives. Of interest, large variety in the characteristics and properties of costing systems exists, indicating that a “one size fits all” perspective on costing systems is likely inaccurate. This monograph provides a structured overview of costing system research to explain the co-existence of different costing practices in the cross-section, accompanied with my commentary on this exciting research area, which I hope will be of interest to academics. On multiple occasions, this body of research has come to prescriptive conclusions, which I believe will also be valuable and insightful to practitioners designing costing systems and managers using reported cost data.

While “cost” is a term commonly used in business and daily life, a very specific yet generalizable definition does not exist, as such definition depends on the purpose or objective of the cost measurement exercise. Hence, in this monograph, I will follow the very high level definition by Demski and Feltham (1976) of cost as “a description of the sacrifice associated with some abstract cost object”. A costing system, then, is
Introduction

defined as the set of procedures used to measure cost. The premise is that firms have limited information about the underlying true cost function they would like to approximate, and costing systems will help provide such approximation. Costs are not measured in a vacuum, just for the sake of measuring them; the objective of our purpose for this measurement needs to be considered. That is, we need to consider the specific endogenous demand for cost reports (Demski, 1981). I will explain how the choices of the “abstract object” that needs to be measured and which “sacrifices” to include in that measurement depend on the source of the demand for cost information.

I structure this monograph around four primary purposes of such cost measurement exercise. The first is decision-making, also termed decision-facilitating by Demski and Feltham (1976). Firms make many decisions, such as capacity acquisition, capacity allocation, product mix, pricing, supplier selection and closing of business units or plants. Under this objective, we consider a single decision maker (e.g., firm or employee) optimizing a particular problem. In order to be useful for decision-making, costing systems try to measure the marginal cost relevant to the decision at hand. The second purpose is cost management. Firms typically want to do more with fewer “sacrifices” in order to stay competitive. An understanding of the production processes will be key here, as will be the amounts of resources available and used. Inventory valuation for financial and tax accounting constitutes the third purpose. Here, compliance with regulatory requirements drives demand for cost information. Cost management and inventory valuation can be seen as special cases of a decision-making objective. For a cost management objective, cost information will help facilitate the firm’s

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1 As the references in this introduction make clear, the idea of linking the type of information that the cost accounting function is asked to provide with the objective for which the cost information will be used is a very old one. Clark (1923, pp. 236) already lists 10 different objectives for the demand for cost accounting information and the required corresponding cost measurement. For readers without time to tackle this book’s 502 pages, I recommend Frank (1990) who discusses the main insights from the book, demonstrating how many insights in contemporaneous management accounting originated with Clark (1923). Vollmers (1996, Appendix B) lists the objectives for cost accounting specified by a large set of textbooks published between 1921 and 1948.
decisions about resources that affect the cost structure, whereas for inventory valuation, cost information is provided to facilitate decisions by outside stakeholders such as users of financial statements and tax authorities. Because the characteristics of cost information useful for these two types of decisions are different from the types of decisions studied under the heading of the first objective, I will treat them as different objectives. The last purpose is control and performance measurement, also termed decision-influencing by Demski and Feltham (1976). This introduces a multi-person context, with different people optimizing their own objectives from which they derive utility. Shareholders want to measure how well the CEO and the firm’s leadership team are performing, managers aim to control the work of their employees, and firms desire to understand the performance of outside parties, such as suppliers. When viewed through an economics lens, we can couch these relations in a Principal-Agent setting. In order to be useful for performance measurement, costing systems ought to provide measures of whether the Agent spent time on the right tasks and worked hard or not.²

The purpose of the cost measurement will not only determine what object we want to measure (e.g., marginal cost in decision-making settings) and which costs to include as “sacrifices” (e.g., all factory costs for inventory valuation for financial accounting statements), but also what constitute desirable properties of cost information, such as relevance, reliability, accuracy, level of detail, timeliness, compatibility, up-to-datedness, and frequency of reporting. Following Clark (1923, Chapter IX)”’s old adage “different costs for different purposes”, Kaplan

²Different classifications of objectives for managerial accounting exists. For example, as indicated, Demski and Feltham (1976) put forward a coarser classification that distinguishes solely between decision-facilitating (decision-making) and decision-influencing (performance measurement). Kaplan (1988) lumps the cost management objective in with both the decision-making purpose (with cost reduction as a decision made by management) and the control purpose (as a type of operational control). I prefer to separate cost management from both as (1) the “object” on which to collect cost information is not marginal cost as in the other decision-making examples and (2) the control of costs is exerted on an object, rather than on an agent who has incentives and their own objectives from which they derive utility, which is key in how I have defined the performance measurement objective in its multi-person context.
(1988) demands that costing system properties should differ for each objective. For example, Kaplan (1988) argues that decision-making requires frequent detailed cost information, while for inventory valuation for financial accounting and tax purposes, a firm needs much more aggregate and less timely cost information. As another example, Clark (1923, Chapter XII) argues that to “tie in” with financial accounting, cost accounting needs to measure nothing more than total operating expenses, while to detect losses, waste and pilfering, a firm needs complete records of actual costs and standards for efficient production against which to compare these. Throughout this monograph, as I develop on each cost measurement objective, I will define what constitutes the “abstract object” and “sacrifices” for each purpose, and discuss the properties of cost measurement most desirable for each objective.

Before we can have a meaningful discussion on the different demands placed on costing systems, we have to first cover the techniques by which the cost information can be supplied. Part 1 of the monograph relates to the production or supply choices made by costing system designers. It covers the literature on the techniques typically used in the production of cost information in the presence of limited information about true cost behavior, the literature on errors in costing systems which researches how close the approximation by the costing system gets to that true costs, and the unanswered questions in this literature. Part 2 moves onto the demand side for cost information. First, I cover the first objective for which the provision of cost information is requested: decision-making. The decision-making purpose of cost measurement is the most developed in the academic literature, and over the decades has steadily grown in importance in management accounting textbooks from being the subject of 6% of chapters in 1940s textbooks, over 33% in 1960s textbooks (Horngren, 1989), to over 60% in the latest edition of the leading managerial accounting textbook by Horngren et al. (2015). After a chapter that covers the general insights on costing to support decision-making, I move to more detailed insights for several specific types of decisions. A lot of the work has focused on the capacity acquisition, allocation, product mix and pricing decisions, but customer portfolio decisions, inventory management decisions and decisions on managing competition are also important and discussed. Next, I look at
cost management, inventory valuation, performance measurement and the requirements these demands place on the cost measurement object, the resource sacrifices to consider and the desirable properties of the costing system.

As will become abundantly clear from Part 2, the different sources of demand for costing information affect which costing system properties are most beneficial. Firms typically need cost information to support many of these objectives, and hence face a problem. Practically, it is very difficult to have more than one costing system, with every costing system designed to be optimal for one specific objective, or even one specific decision. Not only is the expense of developing and maintaining multiple costing systems prohibitive for many firms, but it would also result in confusion among the users of the cost information, and may even get firms in trouble with the tax authorities if they use different “books” for tax reporting purposes than for, say, divisional performance evaluation. In Part 3, I develop on the conflicts created between different demands for product costing. I contrast information for decision-making purposes with information more useful for performance measurement in general. I will also cover issues that arise in transfer pricing where conflicting requirements are placed on cost information with respect to measuring and rewarding performance of business units, corporate tax minimization and the coordination of production and procurement incentives. Next, I will contrast costing requirements for inventory management, inventory control and inventory valuation. Lastly, I will cover exemplar research papers that identify settings where different demands for cost information may, rather than conflict, simply interact in a neutral way, and interactions may potentially be beneficial.

Before moving to Part 1, I want to outline the scope of the literature reviewed in this monograph. My focus is on papers that specifically relate to cost information and the properties thereof. Cost information is arguably one of the most important aspects of managerial accounting information, and while the broader literature on properties of managerial accounting information can also be relevant to the topic of cost information and I will refer to some select papers in this literature, as a whole that literature is out of the scope of this monograph. Furthermore, my main perspective is looking at costing systems through an economics
lens, and this monograph surely underrepresents research on the topic from a psychology or sociology (or any other) lens. I refer the reader to the Foundations and Trends in Accounting piece by Luft and Shields (2009) for an overview of psychology based research in management accounting.³ Next, this monograph aims to be useful both to novices in the costing field who are searching for a primer on this literature as well as for people familiar with (some of) the literature who are interested in a structured overview and thoughts on where future research avenues may lead. Hence, given this heterogeneity, an advanced reader can skip or skim some sections in the monograph.⁴ Lastly, while the reference list of this monograph is very long, the overview is by no means complete nor exhaustive, and I apologize upfront to the authors of relevant research papers that I have missed or left uncited.

³While Luft and Shields (2009) is not specifically about costing systems, they feature in many sections in this work (e.g. Chapters 5 and 6). While I am not aware of an overview piece that specifically studies costing from a behavioral perspective, other behavioral accounting research summaries that cover some of this work are Luft and Shields (2003) and Sprinkle (2003).
⁴For example, big parts of Chapters 2, 5 and 10 are of a more basic level.
References


References


References


References


References


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Hemmer, T. and E. Labro (2019, forthcoming). “Management by the Numbers: A Formal Approach to Deriving Informational and
References


References

Labro, E. (2006a). “Analytics of Costing System Design”. In: Contempora-
ry Issues in Management Accounting. Ed. by A. Bhimani. Oxford: 
Oxford University Press.
Warranted from a Cost Commitment Perspective?” Supply Chain 
Accounting Research. 27(1): 133–138.
tems: Longitudinal Evidence from the Health Care Sector”. Working 
Paper.
Management Accounting Research: Process Considerations Based 
on Two Constructive Case Studies”. European Accounting Review.
12(3): 409–442.
Labro, E. and M. Vanhoucke (2007). “A Simulation Analysis of Interac-
tions Among Errors in Costing Systems”. The Accounting Review.
Labro, E. and M. Vanhoucke (2008). “Diversity in Resource Consump-
tion Patterns and Robustness of Costing Systems to Errors”. Man-
agement Science. 54(10): 1715–1730.
Cost of Operating a Service Departments when Reciprocal Services 
Exist”. The Accounting Review. 64(3): 450–467.
Cost Drivers on WIP and Throughput in a Pull Production Envi-
Costing Decision Heuristics for Product Acceptance Decisions”.
Lere, J. C. (1986). “Product Pricing Based on Accounting Costs”. The 
Accounting Review. 61(2): 318–324.


References


References


References


