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The Effects of Domain Experience and Task Presentation Format on Accountants' Information Relevance Assurance

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ABSTRACT: Information relevance advisory services offer growth opportunities for accountants in CPA firms, but we know little about the types of knowledge needed to provide high-quality advice. In a two-stage experiment, accountants with different management and public accounting experiences (that we suggest lead to different types of knowledge) receive task information in alternative formats, and develop relevant information for a client's decision. We find that participants are more likely to choose an appropriate problem representation when they receive an appropriate task format or when they have more management or public accounting experience (stage one). Also, when participants choose an appropriate problem representation, more management accounting experience improves their development of relevant information, but more public accounting experience does not (stage two). Our results suggest that tailored task presentation and domain experience that

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facilitates acquisition of multiple knowledge types improve accountants' information relevance advice.

Keywords: information relevance assurance; domain experience; task presentation format; problem representation.

Data Availability: Contact the authors.

I. INTRODUCTION

The American Institute of Certified Public Accountants' (AICPA) CPA Vision Project—2011 and Beyond (AICPA 1999a) identifies information assurance as a core service that will enable accountants to add value for decision makers over the coming decades. As information assurers, accountants can independently improve information reliability by auditing information that others prepare, and accountants also can independently improve information relevance by identifying, producing, and analyzing essential information through business advisory services (AICPA 1996). The CPA Vision statement emphasizes that enhancing information relevance "repositions the CPA higher on the value chain with clients and employers" and "moves the profession away from a backward looking, historical focus into a future or value-oriented mindset" (AICPA 1999b, 6).

CPA firms' relevance-improvement services include a variety of future-oriented activities, such as designing information systems for clients, advising them about particular transactions, and estimating cash flows from alternative future strategic actions (Böer 2000). The objectives and information needs for these engagements vary across clients, decisions, and contexts. Thus, an accountant typically must first identify the nature of the client's decision problem and create a problem representation¹ that reflects its key elements, then develop essential information—and do both without structured guidance.²

Because accountants face varying client objectives across relevance assurance engagements, they likely need knowledge gained through experience to help them select appropriate problem representations and develop relevant information. Thus, CPA firms, their clients, and accounting educators need to know the kind(s) of experience-based knowledge an accountant needs to provide high-quality information relevance advice for future-oriented decisions. For example, at the problem representation stage, the accountant may use knowledge gained through experience in a broad domain (such as accounting) to identify and represent a client's problem. Then, he or she may use a different type of knowledge gained through experience in a specialized domain (such as management accounting) to develop relevant information. Differences in objectives across relevance assurance engagements also make it difficult for CPA firms to develop standardized task presentation formats and work program templates to assist accountants. This means that a novel or inappropriate task presentation format may hamper even experienced accountants' access and use of their knowledge (Shanteau 1992).

We use an experiment to examine how experience—both in broad and specialized domains—and task presentation format affect accountants' problem representations and

¹ A problem representation is a mental picture or framework of the key components of a problem that specifies how to solve the problem (Anderson 2000, 264).

² In contrast, accountants conduct reliability-improvement services (such as historical financial statement audits) within a relatively constant, and relatively structured task assignment of obtaining sufficient competent evidence to form a GAAP-compliance opinion. Accountants obtain the well-defined knowledge needed for auditing through formal training and experience. Further, CPA firms have auditing standards and structured decision aids that help auditors construct appropriate and relatively invariant problem representations for all phases of audits.

information development in a relevance assurance task. Our task requires participants to identify opportunity costs for timing of a client's disinvestment decision.³ The task (implicitly) requires participants to estimate future cash flows for two alternative actions: disinvest now vs. disinvest later.

We manipulate *task presentation format* between participants by providing either historical accounting earnings or historical cash flow information. To examine the effects of *experience* in broad vs. specialized domains, we recruit experienced accountants from both public and private (management) accounting. These participants are likely to possess similar amounts of experience in the broad domain of accounting, but different amounts of experience in the specialized domain of management accounting, specifically in developing information for future-oriented decisions. Consequently, they are likely to have different amounts of the types of knowledge required for the two stages of the task.

Stage one results suggest that task presentation format affects accountants' problem representations. Further, participants with more experience in either management or public accounting are more likely to select the appropriate future cash flow-based analysis as their problem representation. These findings suggest that broad domain experience can create one key element of knowledge required for performance in the task's problem representation stage—knowledge structures for recognizing problems that require analyses of cash flows.

Stage two results reveal that participants who have more management accounting experience develop more opportunity costs—if they choose a future cash flow analysis, but not if they choose a future earnings analysis. However, public accounting experience does not help participants to develop opportunity costs. We conclude that, because of their more extensive and varied specialized domain experience, only experienced management accountants develop a key type of knowledge that aids their performance beyond the problem representation stage—procedural rules for identifying relevant (future) opportunity costs.

The remainder of this paper contains four sections. Section II develops the hypotheses. Sections III and IV, respectively, present the research design and results. Section V discusses the results and possible implications.

II. BACKGROUND AND HYPOTHESES DEVELOPMENT Relevance-Improvement Assurance Services

Accountants can apply relevance-improvement assurance services at any stage in the decision process (Elliott 1997, 1998; AICPA 1996). These stages include defining and representing the problem, determining information requirements, developing the information, and analyzing it to facilitate decision making.⁴ In this paper, we examine accountants' relevance-improvement behavior at (1) the problem representation stage, and (2) the information development stage.

The specific task we examine (opportunity cost identification for a client's disinvestment timing decision) is inherently context-dependent and requires considerable knowledge to address. For example, it requires knowledge of the cost of capital, cost behavior, time value of money, typical business practices, and cash flow and opportunity cost concepts. Furthermore, there are no generally accepted templates or standards for developing a solution.

³ In this study, we use an instrument structured on the case in Vera-Muñoz (1998). While Vera-Muñoz (1998) examined the effect of declarative knowledge of financial accounting concepts on graduate business students' ability to identify opportunity costs, she could not address the effects of knowledge gained through accounting experience, because her participants had little accounting experience. Further, she did not manipulate presentation format or address the two-stage relation examined here.

⁴ The AICPA's Special Committee on Assurance Services defines assurance services as "independent professional services that improve the quality of information or its context for decision makers" (AICPA 1996). Information quality refers to its reliability, relevance, and completeness for a particular decision. Information context includes all aspects of the decision setting and a decision model that defines relevant variables.

To develop a solution for such an unstructured task assignment, an accountant must draw on his or her knowledge related to the specific task. As indicated above, accountants must acquire this knowledge through experience in the general and specific domain of the task.

Domain Experience

Domain experience consists of encounters related to a particular discipline that provide the opportunity for acquiring knowledge (information stored in memory) about that discipline (Libby 1995). Experience can create three different types of knowledge:

- 1. declarative knowledge consisting of basic factual knowledge about the domain;
- 2. *knowledge structures* that organize basic factual knowledge around underlying principles or categories (e.g., accountants may have cash flow-based knowledge structures that reflect categories of financial items that affect future cash flows and costs [including opportunity costs], and historical accounting earnings-based knowledge structures that reflect categories of items that affect earnings such as sales transactions, purchase transactions, accruals, and allocations); and
- 3. *procedural knowledge* consisting of stored information about if-then rules that provide situation-specific solutions to problems (e.g., experienced management accountants might have the if-then rule: "if the decision involves a choice between paying cash now vs. later, then use the opportunity cost of capital [rather than historical interest expense rates] to compute the discounted value of future cash flows").

Amounts of broad domain experience (experience that is common across all specialized areas within a broad domain) and specialized domain experience (experience that is peculiar to a specialized area) differ across types of employment such as public and management accounting. Further, broad and specialized domain experience play different roles in the acquisition of the three types of knowledge described above. Declarative knowledge comes from the education and training that typically is part of broad domain experience. Consequently, we expect all our participants to have sufficient declarative knowledge to complete the experimental task. We also expect all of our participants to have developed multiple knowledge structures through experience in the broad domain of *accounting*. Finally, we expect that, because of management accounting's focus on the future, only our participants with experience in the specialized domain of *management accounting* have developed procedural knowledge for our task (Anderson 2000; Voss et al. 1983). Because all three types of knowledge gained through experience can play a role in performance of information relevance advisory services, we expect different effects of broad vs. specialized domain experience on performance of our experimental task.

Problem Representation Choice (Stage One)

The first stage of a relevance-improvement task is creating a problem representation, or framework or model, of a problem's structure that specifies how to solve it. Thus, a problem representation guides problem solution, and inappropriate problem representations can lead to poor solutions. Two factors expected to influence problem representations are domain experience (that leads to differences in knowledge structures) and task presentation format.

Experience

Experience in a domain leads to well-developed knowledge structures (e.g., Bonner et al. [1996] and Tubbs [1992] in auditing; Chi et al. [1981] in physics), and these experience-related knowledge structures have a major impact on problem representation quality. In a

classic study, Chi et al. (1981) examine differences in problem representations between experienced and inexperienced physicists. Experienced physicists tend to represent problems based on underlying physics laws because their knowledge structures are organized around the laws of physics, while novices (who lack such knowledge structures) tend to focus on surface features such as whether a problem involves pulleys or inclined planes.⁵ Researchers have not explored the relation between and among domain experience, knowledge structures, and problem representation for an accounting-related task.⁶

Task Presentation Format

Research in psychology and accounting finds that task presentation format affects the quality of judgment and decision making (e.g., Maines 1995; Hogarth 1987). A portion of format's effect on judgment derives from its effects on problem representation. Research on analogical transfer (Holyoak and Koh 1987; Spencer and Weisberg 1986; Stein et al. 1986) finds that task presentation format affects subjects' abilities to transfer their knowledge from a previously solved problem to create an appropriate representation for a new problem. In accounting, Hopkins (1996) finds that presentation format affects analysts' problem representations related to mandatorily redeemable preferred stock. Specifically, he finds that classification of the stock as debt or equity led to problem representations that used attributes of these financial instruments, whereas classification as neither debt nor equity (i.e., presented in the "mezzanine") led to problem representations that used individual attributes of the instrument.

Taken together, the lines of research on experience and presentation format suggest that more management accounting experience (related to the specialized domain of our task) leads to an appropriate (cash flow-based for our task) knowledge structure, and knowledge structure leads to an appropriate (cash flow-based for our task) problem representation for the task. This experience-based knowledge structure effect should occur only when accountants see the less appropriate (historical earnings-based) format. There should be no effect of management accounting experience in the historical cash flow format because this format should make cash flows salient, so that even accountants with low management accounting experience should choose the cash flow representation in this situation (e.g., Plous 1993).⁷

In contrast to the above predictions, there are at least two reasons why management accounting experience may not have a positive effect in the accounting earnings format. First, a recent study with experienced management accountants finds mixed support for a relation between experience and well-developed knowledge structures (Dearman and Shields 2001). If these results generalize, then our participants may not possess cash flow-based knowledge structures that enable them to create cash flow-based problem representations (in either presentation format condition). Second, performance observed in individuals with well-developed knowledge structures may depend on task characteristics such as presentation format as well as on their knowledge structures (Shanteau 1992). In particular, persons experienced with a particular presentation format may be affected adversely by deviations in format (e.g., Fischhoff 1982). Blessing and Ross (1996) find that experienced

⁵ Researchers in medicine (Lesgold et al. 1988), mathematics (Schoenfeld and Hermann 1982), and computer programming (Weiser and Shertz 1983) find similar results.

⁶ Christ (1993) finds differences in audit-planning problem representations related to broad domain experience (tenure as an auditor). However, her measure of problem representations is very similar to a measure of knowledge structures.

⁷ An incremental accounting earnings problem representation is appropriate in circumstances in which management's main objective is to maximize earnings. However, the (implicit) objective in our task is to maximize net cash flow.

algebra problem-solvers often create an incorrect problem representation when faced with problems not presented in their "typical" format. This suggests that, although experienced management accountants may have appropriate knowledge structures, they may not access them when presented with an inappropriate format because they are accustomed to seeing an appropriate format.

Based on the notion that management accountants have extensive experience with cash flow-based problems and, consequently, very well-developed cash flow-based knowledge structures, we propose our first two hypotheses:

- **H1a:** Management accounting experience will be positively related to the choice of a future cash flow problem representation when task information is presented in an historical earnings format.
- **H1b:** Management accounting experience will not be related to the choice of a future cash flow problem representation when task information is presented in an historical cash flow format.

Research in accounting has not distinguished between specialized and broad domain experience when examining experience-related differences in knowledge structures. Specialized domain experience may not be necessary to create well-developed knowledge structures and high-quality problem representations (e.g., see Voss et al. [1983] for a study of political scientists). Research in accounting shows that, with experience in the broad domain of accounting, public accountants can develop and access multiple knowledge structures that organize accounting concepts around different features of those concepts (Bonner et al. 1996; Nelson et al. 1995; Frederick et al. 1994; Frederick 1991). Consequently, public accountants with broad domain experience may develop both accounting earnings-based and cash flow-based knowledge structures because they receive exposure to decision situations other than historical financial statement auditing (e.g., transaction-planning advice). Further, additional broad domain experience allows an individual greater access to knowledge structures in memory. Again, this advantage afforded by greater experience should occur only when accountants receive the historical earnings format because the cash flow format should make the appropriate representation salient.

In contrast to the above predictions, there are at least two reasons why public accounting experience may not have a positive effect on problem representation choice in the historical accounting earnings format. First, public accountants' experience consists predominantly of reporting historical outcomes; thus, they may be disadvantaged vis-à-vis management accountants in a future-oriented task because they possess less management accounting experience on average, and consequently, may not develop cash flow-based knowledge structures. Second, even if public accountants can develop the knowledge structures, set effect research (e.g., Anderson 2000) indicates that persons experienced in accessing certain knowledge structures tend to use the structures in creating problem representations, irrespective of problem content. For instance, Vera-Muñoz (1998) provides evidence that individuals with formal accounting training tend to access GAAP-based knowledge structures to construct a problem representation for an opportunity-cost identification problem similar to that used in this study. This suggests that public accountants would tend to access and use inappropriate knowledge structures for future-oriented decision problems.

Based on the previous accounting research demonstrating that public accountants can develop and access multiple knowledge structures, we propose the following hypotheses:

- **H2a:** Public accounting experience will be positively related to the choice of a future cash flow problem representation when task information is presented in an historical earnings format.
- **H2b:** Public accounting experience will not be related to the choice of a future cash flow problem representation when task information is presented in an historical cash flow format.

Relevance-Improvement Task Performance (Stage Two)

The second stage of the relevance-improvement task is development of relevant information. Two factors that are likely to affect relevant information development performance are problem representations and experience in a specialized domain (that leads to procedural knowledge).

Problem Representations

As mentioned earlier, inappropriate problem representations can lead to poor performance. Research in mathematics (Blessing and Ross 1996), medicine (Lesgold et al. 1988; Patel and Gröen 1986) and other areas (Anderson 2000) shows that problem representation quality affects identification of relevant information. The researchers' explanation is that problem representations naturally incorporate relevant categories of items and at least some relevant items within categories.

Experience

Some research indicates that individuals with greater domain experience have an advantage in problem solving beyond that conferred by well-developed knowledge structures. This advantage is due to *procedural knowledge*. Individuals acquire knowledge structures through experience in a *broad* domain. In contrast, individuals develop procedural knowledge through experience in a *specialized* domain (Anderson 2000). Specialized domain experience leads to development of knowledge of rules that are specific to particular tasks (Voss et al. 1983).

In accounting, two studies examine the relation between experience and procedural knowledge (Bonner and Walker 1994; Bonner et al. 1992), but do not examine the effects of specialized vs. broad domain experience on procedural knowledge. Also, several accounting studies examine whether there are differential performance effects of specialized vs. broad domain experience, but they do not relate experience to procedural knowledge (Solomon et al. 1999; Wright and Wright 1997; Johnson et al. 1991; Ashton 1991; Bonner and Lewis 1990).

Procedural knowledge may improve performance because task-specific rules can identify better solutions than can broad rules associated with problem representations. For example, Voss et al. (1983) find that political scientists without specialized experience related to the Soviet Union have similar problem representations to those with specialized experience, but their ultimate problem-solving performance is poorer because they lack Soviet Union-specific rules. As an example for opportunity-cost identification, the task-specific rule for discounting future cash flows at the cost of capital (rather than at historical interest rates) is superior to a generic rule for whether a financial item affects cash flow.

Furthermore, procedural knowledge seems to improve task performance only when an appropriate problem representation is in place. Problem representations incorporate knowledge structures, and persons with specialized experience have stronger mental links between knowledge structures and relevant procedural knowledge (Zeitz 1997; Bédard and Chi

1993). These links allow for easier access to information (Anderson 2000). No prior accounting studies have examined the joint effects of specialized domain experience and problem representations on task performance. However, based on the prior work in other areas, we expect that an appropriate problem representation will help accountants with specialized domain experience to access the relevant procedural knowledge, whereas an inappropriate problem representation will not.

Management accountants are likely to have specialized on-the-job experiences that will allow them to develop procedural knowledge for evaluating opportunity costs for alternative future-oriented decisions. This is because management accounting tasks are often focused on strategic and financial planning, budgeting, forecasting, and cash management alternatives that require use of future-oriented costs and benefits. This leads to an expectation that more management accounting experience will be related to identification of more opportunity costs, but only when accountants choose a future cash flow problem representation.

However, counter to the findings discussed above, some research suggests that there is no additional effect of procedural knowledge for individuals who choose appropriate problem representations (Vessey 1991; Lesgold 1984; Larkin 1983). These studies use more structured tasks, while the studies cited above use less structured tasks. Because our disinvestment-timing task is a less structured task, these latter results may not be applicable.⁸ To test our predictions, we propose:

- **H3a:** Management accounting experience will be positively related to the number of relevant opportunity costs identified when an accountant chooses a future cash flow problem representation.
- **H3b:** Management accounting experience will not be related to the number of relevant opportunity costs identified when an accountant chooses a future accounting earnings problem representation.

In contrast, more public accounting experience is not likely to lead to development of more opportunity costs for either problem representation choice because public accountants' experience in the specialized domain of management accounting will not be sufficient to obtain relevant procedural knowledge. For example, many psychologists (e.g., Ericcson 1996) suggest that persons need thousands of hours of experience in a domain to obtain high levels of procedural knowledge. However, whether public accounting experience will have this effect is uncertain because previous studies (for a summary, see Bonner and Pennington 1991) have shown high-quality performance by public accountants in various tasks for which they clearly have not had thousands of hours of practice. Thus, the effect of public accounting experience is uncertain, but based on the important relation of specialized domain experience to procedural knowledge we propose:

H4a: Public accounting experience will not be related to the number of relevant opportunity costs identified when an accountant chooses a future cash flow problem representation.

⁸ Additionally, Dearman and Shields' (2001) results regarding experience and knowledge structures may suggest that it is difficult to acquire procedural knowledge through specialized management accounting experience due to lack of informative feedback.

H4b: Public accounting experience will not be related to the number of relevant opportunity costs identified when an accountant chooses a future accounting earnings problem representation.

III. METHOD

Experimental Task and Procedures

We asked participants in our between-subjects experiment to assume the role of an assurance services provider who has been assigned by a partner to develop information to support a recommendation for a disinvestment timing decision faced by a client. A key element of task performance is identification of relevant opportunity costs. We chose this task for two reasons. First, it is a relatively common task that requires some knowledge of accounting concepts, but differing contexts prevent development of a structured solution template across contexts. Second, accountants with various amounts of management accounting experience (including none) should have declarative knowledge for the task because they all have classroom instruction in the underlying concepts.

The case materials indicate that the state government has condemned a shopping mall and the client (president of one of the mall's tenants) wants to know whether she should vacate their space at the end of the current year or at the end of the next year. The two mutually exclusive options involve a trade-off in cash receipts and expenditures over time, thus giving rise to opportunity costs. Specifically, the following opportunity costs are relevant if the client decides to delay closing the store: (1) return on disposal proceeds of the store's fixed assets; (2) sublease revenue on the store's current retail location; (3) return on the differential compensation award offered by the lessor; (4) return on differential advertising outlays; (5) return on the early retirement of bonds; and (6) the opportunity cost of capital used to compute the discounted value of cash flows.⁹

Part One of the case materials (experimental phase) includes instructions, an assignment memorandum, supporting addenda, and a response memorandum. In Part One, we randomly assigned each participant to a task presentation format condition (denoted FORMAT) that used either historical cash flow or historical earnings terminology and data. Otherwise, the cases are identical and subjects could transform either data set into the other. To reduce task complexity, we instructed participants to ignore income taxes. Appendices A and B show the two formats, and Appendix C presents a suggested solution for relevant opportunity costs. Part Two (post-experimental phase) includes a debriefing questionnaire, an opportunity cost knowledge test, and a participant background questionnaire.

The cash flow-based format includes an historical cash flow statement for the store, accompanying notes, and a narrative of prospective financial information including excerpts from a projected cash flow statement for the next two years. The accounting earnings-based format includes an historical income statement, accompanying notes, and the same narrative of prospective financial information and excerpts from a projected income statement for the next two years. As examples, all participants received information about the net book value of fixed assets and parallel information about the expected disposal value of those assets within a two-year period. They also received information about the client's lease cost

⁹ We identified the opportunity costs from a review of prior accounting research on opportunity costs and behavior, current authoritative textbooks, and monographs on opportunity costs and resource allocation decisions (Horngren and Foster 1991; Heyman and Bloom 1990; Atkinson 1987). Additionally, three management accounting professors and a retired partner from a Big 5 firm tested the materials and agreed on the relevance of the opportunity costs we identified. We included the five opportunity costs items used in Vera-Muñoz (1998), and added a sixth, the return on the early retirement of bonds.

and the going rate of lease renewal. Furthermore, participants received the current book value of five-year bonds for possible calculation of accounting gain on early retirement of the bonds, as well as parallel information about their current market value for calculating the forgone return on the bonds' early retirement at their market value.¹⁰

Participants and Administration

We solicited participants with at least two years of accounting experience, some of whom were principally public accountants and some of whom were principally management accountants in private industry. We measure management accounting (MA) experience and public accounting (PA) experience using the square root of months of MA experience and the square root of months of PA experience, respectively.¹¹

To ensure adequate variation in both MA and PA, we recruited participants from several groups of accounting professionals. We mailed a packet containing a cover letter plus the case materials for Part One to 350 CPAs randomly selected from the AICPA membership rosters from three Midwestern states, and to 50 Executive M.B.A. (E.M.B.A.) alumni in accounting positions randomly selected from the University of Notre Dame's E.M.B.A. alumni directory. The post office returned eight packets due to insufficient or unknown addresses. Forty-three CPAs and ten E.M.B.A. alumni completed the study, for response rates of 13 percent and 20 percent, respectively.¹² In addition to these mailings, 13 accountants currently enrolled in the university's E.M.B.A., and 44 audit associates from a large national CPA firm voluntarily completed the study (three additional associates failed to provide supporting computations and were excluded). The audit associates participated at their firm's national education center in four different sessions over a three-month period.^{13,14} The others completed the experiment at remote locations, and faxed the response memorandum and supporting calculations for Part One to the experimenters. Immediately upon receiving the completed Part One, one of the authors faxed or e-mailed Part Two to the participant, who in turn either faxed or e-mailed the completed Part Two.

Table 1 shows that usable response rates were about equal across the two task presentation formats, and that our participant solicitation techniques were successful in that the

¹⁰ There were some inevitable differences between presentation formats, but these differences had to do with irrelevant items (e.g., depreciation and bond premium amortization), which we exclude from our analyses herein because they are not opportunity costs. Furthermore, we regressed the total number of irrelevant items included in the participants' analyses on the independent variables in our stage-two regression model in Section IV. Management accounting experience and public accounting experience had no relation to the number of irrelevant items included (p = 0.951 and p = 0.419, respectively).

¹¹ We use square root measures to reflect likely diminishing incremental effects of experience. In contrast to Mikhail et al. (1997), we use the square root form rather than power or logarithmic transformation because some managers have zero experience in management accounting or public accounting. We obtain similar results using raw months of MA and PA.

¹² We anticipated a low response rate due to the substantial task demands. To provide participation incentives, we entered the participants in a lottery for 24 football tickets for the University of Notre Dame's home games, plus a grand prize consisting of a cash award of \$450 to cover air fare for two persons. We had very limited data to examine differences between respondents and nonrespondents because of information limitations placed upon us by the AICPA and E.M.B.A. program. We compared respondents and nonrespondents, therefore, on only employer type and gender. There were no differences between these groups on firm, but respondents included a higher percentage of males than did nonrespondents. Adding gender to the analyses does not qualitatively change the results.

¹³ One of the experimenters was present at all of the sessions. Subjects sitting contiguously worked on different experimental conditions. The experimenter asked the auditors and their instructors to refrain from discussing the study with their co-workers once back at their local offices.

¹⁴ The audit associates completed Part One in 46 minutes, on average, and the CPAs and E.M.B.A.s completed Part One in 49 minutes, on average. These means are not statistically different (p = 0.371), suggesting that differences in experimental administration methods (mailing vs. on-site) did not affect the time required to complete the experimental task.

Variables	Means or Free	quencies
Task Presentation Format ^a (FORMAT): Historical accounting earnings Historical cash flow	n = 53 (48) n = 57 (51)	.18%) .82%)
Accounting Experience in Months	Management	Public
AICPA members	104	101
E.M.B.A.s	159	18
Audit Associates	10	47
Mean	78	62
Opportunity Cost Knowledge Score ^b (TESTSCORE)	5.11 (s.d. =	1.33)
Analysis Method Choice ^c (CHOICE): Future accounting earnings Future cash flow	n = 34 (3 n = 76 (6	1%) 9%)
Number of Opportunity Costs Identified (OPPCOSTS): ^d	2.65 (s.d. =	1.79)

	TABLE 1	
Descriptive Statistics: Independent	Variables, Covariate, and Dependent	Variables
	(n = 110)	

^a We randomly assigned participants to one of two task presentation formats, historical accounting earnings-based or historical cash flow-based.

^b Mean opportunity cost knowledge score, measured by participants' numbers of correct responses on a six-question opportunity cost knowledge test.

^c The participants' choice of information analysis method, classified as either future accounting earnings or future cash flow.

^d Mean number of opportunity costs participants identified (maximum possible is six, minimum is zero).

110 participants with usable responses varied substantially on MA and PA. Participants holding management accounting positions described their titles as corporate controllers, senior corporate accountants, chief financial officers, and chief operating officers. Their job responsibilities included strategic and financial planning, budgeting, forecasting, cash management and control, and financial analysis. Participants with public accounting positions described their titles as audit associates, managers, or partners in national, regional, or local CPA firms, and their job responsibilities included all aspects of historical financial statement audits, consulting, and, in a few cases, tax-related tasks. The differences in typical responsibilities imply experiences that would likely produce substantially different types of knowledge.

Variables

We use the explanations and supporting calculations provided by each participant's response memorandum to classify their analysis method (denoted CHOICE) as future cash flow-based if the participant prepared a future cash flow-based analysis, or future earnings-based if the participant prepared a future earnings-based analysis. We determine the number of opportunity costs included in a participant's analysis (denoted OPPCOSTS) by examining

each participant's analyses for evidence of appropriate inclusion of each of the six opportunity costs. Two research assistants independently coded the data and agreed 96.3 percent of the time on CHOICE (Kappa coefficient [Cohen 1960] for inter-rater reliability = 0.915; p = 0.000), and agreed 96.5 percent of the time on OPPCOSTS (Kappa coefficient = 0.929; p = 0.000). We resolved negligible differences in coding via discussion between the raters and one of the authors.

Additionally, we measure two control variables. First, declarative (factual) knowledge about opportunity costs is measured using a series of nine multiple-choice questions. Reliability test results indicate that a total score derived from the answers to the first six questions (denoted TESTSCORE) produces a reliable measure of declarative knowledge (Kuder-Richardson 20 alpha¹⁵ = 0.70). Second, we measured participants' perceptions of the representativeness and difficulty of the task because it is possible that these perceptions are related both to the amount of management accounting experience and to task performance. The measurement scales ranged from "not realistic (not difficult)" to "very realistic (very difficult)."¹⁶

Table 1 presents descriptive statistics on the independent variables, the TESTSCORE variable, and the dependent variables. The table shows that the participants scored well on the opportunity-cost knowledge test, on average. It also shows that more than two-thirds of the accountants chose future cash flows as the analysis method, and that the average number of opportunity costs identified is 2.65 (of a maximum possible of six).

IV. RESULTS

Panel A of Table 2 shows the cross-classification of number of opportunity costs identified (OPPCOSTS) by task presentation format (FORMAT) and analysis method choice (CHOICE). The largest average OPPCOSTS is for those receiving the historical cash flow format and choosing a future cash flow analysis, and the smallest average OPPCOSTS is for those receiving the historical accounting earnings format and choosing a future earnings analysis.¹⁷ Those choosing a future cash flow analysis identified more than twice as many opportunity costs as did those choosing a future earnings analysis (difference significant at p < 0.01, one-tailed). Panel B further decomposes the data by partitioning participants into experienced and inexperienced groups at 60 months.¹⁸ Results show that the highest scores on OPPCOSTS are from participants with 60 or more months of management accounting experience, and those with less than 60 months of public accounting experience who chose a future cash flow analysis tests elaborate and extend this descriptive result.

Tests of Hypotheses

Hypotheses 1a and 2a predict that, when the task is presented in an historical earnings format, more management accounting or more public accounting experience will improve

¹⁵ The Kuder-Richardson 20 measure is appropriate for measuring reliability when the questions are scored as either 0 or 1 for incorrect or correct answers, respectively. It is equivalent to Cronbach's alpha, which is used when individual questions can take on more than two values.

¹⁶ Analyses including these representativeness and difficulty variables (not shown) produced results qualitatively similar to those presented below.

¹⁷ The seven participants who received the historical cash flow-based format but chose a future earnings analysis method also scored relatively low on the opportunity cost knowledge test (mean for TESTSCORE = 3.71 vs. 5.11 overall). We estimated the regressions (see below) excluding these seven participants with no changes in statistical conclusions.

¹⁸ The split at 60 months comes from the findings of Frederick et al. (1994) that public accountants with approximately five years of experience can develop multiple knowledge structures.

TABLE 2 Cross-Classifications Tables For Number of Opportunity Costs Participants Identified (OPPCOSTS)^a

Panel A: Task Presentation Format (FORMAT) and Analysis Method Choice (CHOICE)

FORMAT	Future Accounting Earnings	Future Cash Flow	Total
Historical Accounting Earnings	1.41	3.12	2.25
	(27)	(26)	(53)
Historical Cash Flow	1.43	3.26	3.04
	(7)	(50)	(57)
Total	1.41	3.21	2.65
	(34)	(76)	(110)

	Panel B	: Public	Accounting	Experience,	Management	Accounting	Experience,	and	CHOICE
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CHOICE = Future Accounting Earnings			CHOICE Cash			
Management Accounting	Public Ac Exper	counting ience		Public A Expe	ccounting rience	
Experience	<60 mon.	≥60 mon.	Total	<60 mon.	≥60 mon.	Total
<60 mon.	1.47 (19 [17, 2])	1.60 (5 [3, 2])	1.50 (24 [20, 4])	2.71 (17 [5, 12])	2.90 (21 [9, 12])	2.82 (38 [14, 24])
≥60 mon.	1.20 (10 [7, 3])		1.20 (10 [7, 3])	3.87 (23 [9, 14])	3.20 (15 [3, 12])	3.61 (38 [12, 26])
Total	1.38 (29 [24, 5])	1.60 (5 [3, 2])	1.41 (34 [27, 7])	3.37 (40 [14, 26])	3.03 (36 [12, 24])	3.21 (76 [26, 50])

^a The number of accountants in each classification is shown in parentheses, and in Panel B the numbers of accountants receiving historical accounting earnings and historical cash flow task presentation formats, respectively, are in brackets ([,]).

problem representation performance. Hypotheses 1b and 2b predict that, when the task is presented in an historical cash flow format, more management accounting or more public accounting experience will have no effect on problem representation performance. To test these hypotheses, related to stage one of the task, we estimate the following logistic regression model:

$$CHOICE_{i} = \beta_{0} + \beta_{1}FORMAT_{i} + \beta_{2}MA_{i} + \beta_{3}PA_{i} + \beta_{4}(MA_{i} \times FORMAT_{i}) + \beta_{5}(PA_{i} \times FORMAT_{i}) + \beta_{6}TESTSCORE_{i} + \varepsilon_{i}$$
(1)

where CHOICE, our proxy for problem representation, is coded 1 = future cash flow analysis and 0 = future accounting earnings analysis, FORMAT is coded 1 = historical cash flow-based format and 0 = historical accounting earnings-based format, MA and PA denote the square roots of the numbers of months of management accounting experience and public accounting experience, respectively, and TESTSCORE is the participants' declarative opportunity cost knowledge score.

In equation (1) the intercepts and slopes are allowed to vary between MA and PA, and by FORMAT. The intercept β_0 applies to participants in the historical accounting earnings format, and the incremental intercept β_1 is the difference due to the historical cash flow format. The slope coefficients β_2 and β_3 are the effects of MA and PA, respectively, for the historical accounting earnings format, as predicted by H1a and H2a. β_4 and β_5 measure the *incremental* (relative to β_2 and β_3) effects, respectively, of MA and PA for the historical cash flow format, while $\beta_2 + \beta_4$ and $\beta_3 + \beta_5$ measure the *aggregate* effects of MA and PA, respectively, for the historical cash flow format, thus testing H1b and H2b. The coefficient β_6 represents the effect of participants' opportunity cost knowledge.

Table 3, Panel A presents a summary of logistic regression results estimating equation (1), and Panel B shows our predictions to test the stage one hypotheses.¹⁹ Panel A shows that task presentation format (coefficient β_1) significantly affects choice of analysis method, with an historical cash flow presentation format increasing the likelihood of choosing a future cash flow analysis method (p < 0.01, one-tailed). Also, the coefficient for TEST-SCORE (β_6) is significantly positive (p < 0.01, one-tailed), indicating that basic opportunity cost knowledge helps participants choose the proper analysis.

Panel B of Table 3 shows our predictions and the related regression estimates. When participants receive task information in an historical earnings format, MA (coefficient β_2) increases the likelihood he or she will choose a future cash flow analysis (p < 0.01, one-tailed), supporting H1a. When participants receive task information in an historical earnings format, PA (β_3) also increases the likelihood of a future cash flow analysis choice (p < 0.01, one-tailed), supporting H2a. In contrast, the aggregate effects of MA ($\beta_2 + \beta_4$) and PA ($\beta_3 + \beta_5$) for those receiving the historical cash flow format are not significantly different from zero at conventional levels, consistent with H1b and H2b, respectively.²⁰

Taken together, the Table 3 results indicate that initial task presentation format is an important determinant of analysis method choice, *per se.* Also, consistent with our predictions, when the task presentation is in the less appropriate format (historical accounting earnings-based), accountants with more MA or PA are more likely to select the appropriate analysis method. However, when the task presentation is in the more appropriate format, neither more MA nor more PA increases their tendency to choose the appropriate analysis method.

Hypothesis 3a predicts better average information development performance for participants with more MA when they choose a future cash flow analysis. Specifically, H3a predicts that MA will have a positive effect on OPPCOSTS when participants choose a future cash flow analysis. In contrast, H4a predicts that PA will not be related to OPPCOSTS performance when participants choose a future cash flow analysis. Further, H3b and H4b predict no relation between MA and PA, respectively, and OPPCOSTS when participants choose the inappropriate future accounting earnings analysis.

To test these hypotheses related to stage two of the task, we estimate the following model:

¹⁹ Since CHOICE is a dichotomous measure, the model above does not meet the assumptions of OLS regression. We estimated the model using both logistic and OLS regressions with the same qualitative results. Only the logistic regression results are reported.

²⁰ This is because the incremental effects of MA (β_4) and PA (β_5) in the historical cash flow format are significantly negative (p < 0.05).

TABLE 3 Logistic Regression Model, Predictions, and Results: Stage One—Analysis Method Choice (n = 110)

 $CHOICE_{i}^{a} = \beta_{0} + \beta_{1}FORMAT_{i} + \beta_{2}MA_{i} + \beta_{3}PA_{i} + \beta_{4}(MA_{i} \times FORMAT_{i}) + \beta_{5}(PA_{i} \times FORMAT_{i}) + \beta_{6}TESTSCORE_{i} + \varepsilon_{i}$

Panel A: Logistic Regression Results

	β_0	β_{I}	β ₂	β	β	β	β_6
Coefficient estimate	-10.175	6.913	0.306	0.727	-0.218	-0.654	0.848
Wald statistic	16.473***	8.982***	10.191***	10.280***	2.825**	5.075**	12.192***
Model Summary Statistics							
		-2Log Likelihood		79.928			
		Chi-Square for Model (6 df) p-value		63.114 0.000			
		Percentage Correctly Classified			86.4%		

Panel B: Predictions and Results for Effects of Accounting Experience and Task Presentation Format

Test	Format-Experience Combination ^b	Coefficient	Expected Sign	Coefficient Estimate	Wald Statistic
H1a	HAE-MA	β_2	+	0.306	10.191***
H1b	HCF-MA	$\beta_2 + \beta_4$	0	0.088	0.952
H2a	HAE-PA	β ₃	+	0.727	10.280***
H2b	HCF-PA	$\beta_3 + \beta_5$	0	0.073	0.208

*, **, and *** indicate significance at p < 0.10, p < 0.05, and p < 0.01, respectively (one-tailed).

 $CHOICE_i = 1$ if participant i's choice of analysis method was future cash flow, and 0 if choice was future accounting earnings;

 $FORMAT_i = 1$ if participant i received the historical cash flow format, and 0 for the historical accounting earnings format;

MA_i = square root of participant i's months of management accounting experience;

 PA_i = square root of participant i's months of public accounting experience;

TESTSCORE_i = participant i's score on the opportunity cost knowledge test; and

 $\varepsilon_i = \text{error term.}$

^b HAE, HCF = historical accounting earnings, historical cash flow, respectively.

$$OPPCOSTS_{i} = \beta_{0} + \beta_{1}AECHOICE_{i} + \beta_{2}MA_{i} + \beta_{3}PA_{i} + \beta_{4}(MA_{i} \times AECHOICE_{i}) + \beta_{5}(PA_{i} \times AECHOICE_{i}) + \beta_{6}TESTSCORE_{i} + \varepsilon_{i}$$
(2)

where OPPCOSTS denotes the number of relevant opportunity costs identified (OPPCOSTS

= 0,...,6), AECHOICE is coded 1 = future accounting earnings analysis choice and 0 = future cash flow analysis choice, and other variables are as defined above.²¹

In equation (2) the intercepts and slopes are allowed to vary between MA and PA, and by AECHOICE. The intercept β_0 applies to participants in the future cash flow analysis, and the incremental intercept β_1 is the difference due to the future accounting earnings analysis. The slope coefficients β_2 and β_3 are the effects of MA and PA, respectively, for those choosing a future cash flow analysis as predicted by H3a and H4a. In contrast, β_4 and β_5 measure the *incremental* (relative to β_2 and β_3) effects, respectively, of MA and PA for the future accounting earnings analysis, while $\beta_2 + \beta_4$ and $\beta_3 + \beta_5$ measure the *aggregate* effects of MA and PA, respectively, for those choosing a future accounting earnings analysis, thus testing H3b and H4b. The coefficient β_6 is as defined above for equation (1).

Table 4, Panel A presents a summary of regression estimates of equation (2) and Panel B shows our predictions to test the stage two hypotheses. Panel B shows a significant and positive effect of MA given the choice of a future cash flow analysis: MA (β_2) increases OPPCOSTS when accountants choose a future cash flow analysis (p < 0.01, one-tailed), supporting H3a. In contrast, PA (β_3) is not related to OPPCOSTS when accountants choose a future cash flow analysis (p < 0.01, one-tailed), supporting H3a. In contrast, PA (β_3) is not related to OPPCOSTS when accountants choose a future cash flow analysis (p > 0.34, one-tailed), consistent with H4a.²² The aggregate effects of MA ($\beta_2 + \beta_4$) and PA ($\beta_3 + \beta_5$) in the future accounting earnings analysis are not significantly different from zero at conventional levels, consistent with H3b and H4b.²³

Overall, the effect of management accounting experience on performance is beneficial when participants choose the proper analysis, and has no effect otherwise. Taken together, these results are consistent with our prediction that only management accounting experience significantly improves relevant information identification performance beyond the problem representation stage, and only when participants choose the more appropriate problem representation.

V. DISCUSSION AND IMPLICATIONS

This paper uses an experiment with a two-stage task to examine the separate and combined effects of two factors that may affect accountants' performance in relevanceimprovement assurance tasks: experience (both in broad and specialized domains) and task presentation format. In this final section, we briefly discuss our findings, some implications of the findings for relevance assurance practice and research, and some limitations of the study.

At the problem representation stage of our task, we find that when the participants receive the less appropriate historical accounting earnings-based task presentation format, more experience in either public accounting or management accounting helps them choose the more appropriate future cash flow analysis method. This suggests that broad accounting experience obtained in either public or management accounting positions allows accountants to develop and access an appropriate knowledge structure (consistent with Frederick [1991] and Frederick et al. [1994], but in contrast to Nelson et al. [1995]). We also find that presentation of the task in the more appropriate cash flow format allows inexperienced

²¹ Note that the coding of AECHOICE is the opposite of CHOICE (i.e., AECHOICE = 1 - CHOICE) to facilitate notation for testing H3a and H4a.

²² We also estimated regressions for the CHOICE model (stage one) and OPPCOSTS model (stage two) using a dichotomous measure of MA and PA with accountants having less than 36, 60, or 120 months classified as having "low" experience. All results were qualitatively similar to those reported using the square roots of months of experience.

²³ This is because the incremental effect of MA in the future accounting earnings analysis (β_4) is significantly negative (p < 0.05, one-tailed), and the incremental effect of PA in the future accounting earnings analysis (β_5) is not significant at conventional levels.

TABLE 4OLS Regression Model, Predictions, and Results:Stage Two—Number of Opportunity Costs Identified(n = 110)

 $OPPCOSTS_i^a = \beta_0 + \beta_1 AECHOICE_i + \beta_2 MA_i + \beta_3 PA_i + \beta_4 (MA_i \times AECHOICE_i)$ $+ \beta_5 (PA_i \times AECHOICE_i) + \beta_6 TESTSCORE_i + \varepsilon_i$

Panel A: OLS Regression Results

	β_o	β_{I}	β_2	β	β_4	β_{5}	β_6
Coefficient estimate	2.415	-0.336	0.081	-0.019	-0.155	-0.102	0.065
t-statistic	2.835***	-0.319	2.609***	-0.397	-2.042**	-0.767	0.523
		M	odel Summ	ary Statistics			
		F-statis R ² R ² -adju Std. Et	stic 7 () usted () Tor 1	7.123 (p = 0.0).293).252	00)		

Panel B: Predictions and Results for Effects of Accounting Experience and Choice of Information Analysis Method

Test	Choice-Experience Combination ^b	Coefficient	Expected Sign	Coefficient Estimate	t-Statistic
H3a	FCF-MA	β ₂	+	0.081	2.609***
H3b	FAE-MA	$\beta_2 + \beta_4$	0	-0.074	-1.071
H4a	FCF-PA	β_3	0	-0.019	-0.397
H4b	FAE-PA	$\beta_3 + \beta_5$	0	-0.121	-0.980

*, **, and *** indicate significance at p < 0.10, p < 0.05, and p < 0.01, respectively (one-tailed).

^a OPPCOSTS_i = the number of opportunity costs identified by participant i;

 $AECHOICE_i = 1$ if participant i's choice of analysis method was future accounting earnings, and 0 if choice was future cash flow.

^b FAE, FCF = future accounting earnings analysis, future cash flow analysis, respectively. See Table 3 for other variable definitions.

accountants to choose the future cash flow analysis method, suggesting that the initial task presentation can substitute for some aspects of broad domain experience.

At the information development stage, we find that experience in the specialized domain of management accounting can help information development task performance, but only when participants choose the more appropriate future cash flow analysis method. To our knowledge, no prior study in accounting has demonstrated that choice of analysis method (a proxy for problem representation) and specialized domain experience (which we assume leads to procedural knowledge for our task) jointly affect accountants' ability to develop relevant information. The finding suggests that accountants need specific domain experience for maximum performance, but they must choose the appropriate analysis method to fully realize the benefit of their domain experience. One broad question for practice and future research that arises from our findings is: How can firms facilitate accountants' choice of appropriate analysis methods across various types of information relevance-improvement engagements? One approach might be to develop guidance based on concepts from decision analysis (Elliott 2000; Elliott and Pallais 1997). For example, at the start of an assignment accountants could explicitly identify the client's objective such as "maximize cash flow," "maximize earnings," or "maximize stock value." Also, it may be possible to prepare broad guidance on typical considerations for customizing information from multiple disciplines (AICPA 1996). For example, a template listing information categories typically relevant when considering a possible foreign venture could facilitate information completeness advice. Such a template might include historical data and projections about external competitive, product, and labor markets, internal financial and nonfinancial operating measures, and foreign country laws and regulations, taxes, and cultural considerations that could affect operations and controls.

A second broad question that arises is: How can accountants who lack the procedural knowledge to perform a particular relevance-improvement task obtain that knowledge? One possible answer is development of a central advisory "experience base" that combines the procedural knowledge (situation-specific rules) of multiple individuals, each of whom have had only a few experiences with a specific task, as some CPA firms currently provide to enhance individual auditors' industry knowledge for audit engagements. Whether this particular approach will be effective is an open question, however, because prior research indicates that procedural knowledge can be gained only through personal experience.

A third broad question arises because our experiment examines a single information relevance-improvement task that uses several measurement concepts central to management accounting experience and future cash flow analysis in a single decision context. The question is: Do our conclusions hold for other types of experience, analyses, and contexts? The generality of our findings is an important question because CPA firms offer a wide variety of information relevance-improvement services that integrate a broad range of financial, strategic, and operating measures through new information technologies. Various types of management accounting, taxation, information technology, and systems experiences may help accountants better perform some types of information-relevance tasks, whereas financial accounting experience may help accountants perform other kinds of tasks. For example, future research could examine whether a public accountant's experience auditing clients' risk disclosures for derivatives may facilitate risk-based advisory services that assess uncertainties about future outcomes. Similarly, future research could address whether audit experience evaluating client strategies (Bell et al. 1997) and information technology applications (Public Oversight Board 2000) may help accountants better perform strategy- and technology-related relevance improvement assignments. Finally, our experiment uses traditional financial measures. Our results may not hold for relevance assurance services that integrate nonfinancial leading indicators of performance or critical success factors, such as customer satisfaction, employee training and satisfaction, and product service and quality (Kaplan and Norton 1996). Future research could examine whether industry experience and knowledge of corporate strategy may help accountants perform these services (see Solomon et al. [1999] for an example in auditing).

Furthermore, future research could develop and test theories about what types of accounting knowledge facilitate particular types of relevance assurance services, and how accountants (or a CPA firm) can best acquire that knowledge. From a practitioner's perspective, research may establish the comparative advantages of accountants in performing these services. Also, from an educator's perspective, research could assess how nonaccountants (e.g., managers, consultants, and information technology professionals) can best acquire and use knowledge of accounting concepts such as cost behavior, cash flow, accounting allocations and estimates, regulations, and taxes to improve the quality of information or its context for decision making.

Finally, this study has limitations due to measurement. Specifically, we propose that management accounting experience leads to both well-developed knowledge structures and procedural knowledge, and that public accounting experience leads only to well-developed knowledge structures. We do not measure these important mediating variables (knowledge structures and procedural knowledge). The value of our professional participants' time prohibited us from creating a lengthy instrument that would directly measure both these mediators. In addition, procedural knowledge is difficult to measure directly, and consequently, typically is inferred through task performance (Anderson 2000; Herz and Schultz 1999). Because our dependent variable was task performance, however, we could not use this as a measure for procedural knowledge. Future research could develop better measures of procedural knowledge.

Another limitation of not measuring knowledge structure and procedural knowledge as mediating variables is that experience also can be associated with other differences in individuals. For example, over time, firms may select individuals for promotion based on factors such as ability. Additional research that measures the mediating variables can test our assumptions about the mechanisms by which broad and specialized domain experience affect performance in information relevance assurance tasks, and assess whether there are additional important determinants of performance in these tasks, such as various types of abilities.

APPENDIX A

Experimental Instrument: Historical Earnings-Based Task Presentation Format

Andrew, Henderson & Company Financial Planning Consultants 12-23-X7

STAFF MEMORANDUM

SUBJECT: Operations of Harper & Baker's Sacramento Store

Harper & Baker's Sacramento Store Statement of Income For the year ended December 31, 19X7¹

Revenues:	
Sales	\$1,920,000
Interest (Note 1)	5,400
Total Revenues	\$1,925,400
Costs and Expenses:	
Cost of Sales (Note 2)	576,000
Operating, selling, general and	
administrative expenses (Note 2)	1,020,000
Interest Costs:	
Bonds (Note 3)	12,000
Total Costs and Expenses	\$1,608,000
Net Income	\$317,400

¹ December figures are estimates.

Note 1: Interest Revenue

In 19X7 all the H&B retail stores initiated a company policy of investing their excess cash in a common fund managed by the parent company. Each store received a pro-rata share of its investment in the common fund. The Sacramento store earned \$5,400 this year on an annual investment of \$30,000. This investment and return are expected to remain constant over the next two years.

Note 2: Cost of Sales and OSG&A Expenses

The cost of goods sold represents approximately 30% of sales. Operating, selling, general and administrative expenses (OSG&A) of \$1,020,000 in 19X7 include advertising (\$120,000), depreciation (\$36,000), operating lease (\$96,000), bond premium amortization (\$1,000), and other fixed expenses (\$767,000).

Note 3: Interest on Bonds

As part of a city government's business incentive program, H&B's Sacramento store issued \$100,000 of fiveyear bonds three years ago. The annual interest on the bonds is \$12,000. The current book value of the bonds is \$101,000. Because the interest rates have risen, H&B can purchase the bonds in the market at \$94,900. If Evans chooses to vacate the retail space now, then H&B would have to retire the bonds now, thus yielding an accounting gain of \$6,100. If, on the other hand, Evans chooses to vacate the retail space one year from now, then H&B would liquidate the bonds at their maturity date.

Prospects for the Next Two Years (19X8 and 19X9)

Disposition of Fixed Assets

The Sacramento store's fixed assets, which include display fixtures and equipment, were acquired 7 years ago at \$360,000. Depreciation for financial statement purposes is provided on the straight-line method over an estimated average useful life of 10 years, with zero salvage value.

Evans has decided to sell some of the store's display fixtures and equipment at the time that the store's current retail space is vacated. Evans estimates that the assets can be sold for about \$15,000 either now or one year from now. The net book value of those assets now is \$30,000, and will be \$20,000 one year from now; thus, the assets' disposal would yield an accounting loss of either \$15,000 or \$5,000, respectively.

Lease Contract and Compensation Award

Four years ago H&B signed a 10-year transferable, noncancelable operating lease for the 4,000 square-foot retail location of the Sacramento store, at \$96,000 per year. Due to a recent earthquake, there is shortage of retail space in Sacramento; thus, lease renewals are currently running at about \$144,000 per year for a 4,000 square-foot location. If Evans chooses to vacate the retail space now, she could sublease it to a third party for the next two years at the market rate. Alternatively, if Evans chooses to vacate the retail space one year from now, then she could sublease it to a third party for just 19X9 for \$80,000. Since RPM will be unable to fulfill its lease contract with H&B, it has offered to pay H&B a compensation award of \$300,000 at the time that Evans vacates the retail space.

Projected Annual Operations

For either option, average sales are expected to remain essentially unchanged for the next two years, and the cost of goods sold is expected to remain at 30% of sales. Regarding OSG&A expenses, advertising is expected to increase due to a grand-opening campaign scheduled to be launched the year of the relocation. The following table summarizes projected annual sales and OSG&A expenses for the Sacramento store for 19X8 and 19X9:

Excerpts from Projected Income Statement for 19X8 and 19X9

	Vacates Sacramento Retail Space					
	N	ow	One Year	from Now		
	19X8	19X9	19X8	19X9		
Sales	\$1,920,000	\$1,920,000	\$1,920,000	\$1,920,000		
OSG&A expenses:						
Advertising	300,000	120,000	120,000	300,000		
Depreciation	26,000	26,000	36,000	26,000		
Operating lease	96,000	96,000	96,000	96,000		
Bond premium amortization	1,000	1,000	1,000	1,000		
Other fixed expenses	767,000	767,000	767,000	767,000		
Total OSG&A expenses	\$1,190,000	\$1,010,000	\$1,020,000	\$1,190,000		

APPENDIX B Experimental Instrument: Historical Cash Flow-Based Tasl Andrew, Henderson & Company Financial Planning Consultants 12-23-X7	x Presentation Format
STAFF MEMORANDUM SUBJECT: Operations of Harper & Baker's Sacramento Store	
Harper & Baker's Sacramento Store Statement of Operating Cash Flows December 31, 19X7 ¹	
Cash flows from operating activities: Cash collections: From customers From interest (<i>Note 1</i>)	\$1,920,000 5,400
Total cash collections Cash payments:	\$1,925,400
To suppliers and vendors (<i>Note 2</i>) For operating, selling, general and administrative costs (<i>Note 2</i>) For interest on bonds (<i>Note 3</i>) Total coch recurrents	576,000 983,000 <u>12,000</u> \$1571,000
Net cash provided by operating activities	<u>\$1,571,000</u> <u>\$354,400</u>

¹ December figures are estimates.

Note 1: Cash Collections from Interest

Note 2: Cash Flows Used in Current Business Operations

As a standard practice, the Sacramento store pays in cash to their suppliers and vendors their inventory purchases and operating costs. The cost of sales represents approximately 30% of sales. Cash payments for operating, selling, general and administrative costs of \$983,000 in 19X7 include advertising (\$120,000), operating lease (\$96,000), and other fixed costs (\$767,000).

Note 3: Cash Payments for Interest on Bonds

As part of a city government's business incentive program, H&B's Sacramento store issued \$100,000 of fiveyear bonds three years ago. The annual interest on the bonds is \$12,000. The current book value of the bonds is \$101,000. Because the interest rates have risen, H&B can purchase the bonds in the market at \$94,900. If Evans chooses to vacate the retail space now, then H&B would have to retire the bonds now, thus yielding an accounting gain of \$6,100. If, on the other hand, Evans chooses to vacate the retail space one year from now, then H&B would liquidate the bonds at their maturity date.

Prospects for the Next Two Years (19X8 and 19X9)

Disposition of Fixed Assets

The Sacramento store's fixed assets, which include display fixtures and equipment, were acquired 7 years ago at \$360,000. Depreciation for financial statement purposes is provided on the straight-line method over an estimated average useful life of 10 years, with zero salvage value.

Evans has decided to sell some of the store's display fixtures and equipment at the time that the store's current retail space is vacated. Evans estimates that the assets can be sold for about \$15,000 either now or one year from now. The net book value of those assets now is \$30,000, and will be \$20,000 one year from now; thus, the assets' disposal would yield an accounting loss of either \$15,000 or \$5,000, respectively.

In 19X7 all the H&B retail stores initiated a company policy of investing their excess cash in a common fund managed by the parent company. Each store received a pro-rata share of its investment in the common fund. The Sacramento store earned \$5,400 this year on an annual investment of \$30,000. This investment and return are expected to remain constant over the next two years.

Lease Contract and Compensation Award

Four years ago H&B signed a 10-year transferable, noncancelable operating lease for the 4,000 square-foot retail location of the Sacramento store, at \$96,000 per year. Due to a recent earthquake, there is shortage of retail space in Sacramento; thus, lease renewals are currently running at about \$144,000 per year for a 4,000 square-foot location. If Evans chooses to vacate the retail space now, she could sublease it to a third party for the next two years at the market rate. Alternatively, if Evans chooses to vacate the retail space one year from now, then she could sublease it to a third party for just 19X9 for \$80,000. Since RPM will be unable to fulfill its lease contract with H&B, it has offered to pay H&B a compensation award of \$300,000 at the time that Evans vacates the retail space.

Projected Annual Operating Cash Flows

For either option, average sales are expected to remain essentially unchanged for the next two years, and the cost of goods sold is expected to remain at 30% of sales. Regarding OSG&A costs, advertising is expected to increase due to a grand-opening campaign scheduled to be launched the year of the relocation. The following table summarizes projected annual cash flows from operating activities for the Sacramento store for 19X8 and 19X9:

Excerpts from Projected Statement of Operating Cash Flows for 19X8 and 19X9

	Vacates Sacramento Retail Space			
	Now		One Year from Now	
	19X8	19X9	19X8	19X9
Cash flows from operating activities:				
Cash collections:				
From customers	\$1,920,000	\$1,920,000	\$1,920,000	\$1,920,000
Cash payments:				
Advertising	300,000	120,000	120,000	300,000
Operating lease	96,000	96,000	96,000	96,000
Other fixed costs	767,000	767,000	767,000	767,000
Total cash payments	\$1,163,000	\$983,000	\$983,000	\$1,163,000

APPENDIX C Suggested Analysis for Timing of Disinvestment Decision Using Incremental Future Cash Flows (in \$000s)

Option A: Client vacates now (12-31-X7), and moves the store to its new location on 1-1-X8 12-31-X7 12-31-X8 12-31-X9

	12-51-21/	12-51-110	18-31-11/
Incremental advertising outlays		(\$180)	
Bond retirement	(\$95)		
Proceeds from assets' disposal	15		
Sublease revenue		48	\$48
Compensation award	300		
Total before-tax cash flows	<u>\$220</u>	(\$132)	<u>\$48</u>
Net Present Value (NPV) as of 12-31-X7, at 18% cost of capital	<u>\$143</u>		

Option B: Client vacates one year from now (12-31-X8), and moves the store to its new location on 1-1-X9

	12-31-X7	12-31-X8	12-31-X9
Incremental advertising outlays			(\$180)
Bond retirement			(100)
Proceeds from assets' disposal		\$15	
Forgone sublease revenue			(16)
Compensation award		300	
Total before-tax cash flows	<u>\$0</u>	\$315	(\$296)
Net Present Value (NPV) as of 12-31-X7, at 18% cost of capital	<u>\$54</u>		

Recommendation: The client should vacate now (12-31-X7), and move the store to its new location on 1-1-X8.

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