

A SURVEY OF METHODS USED TO TEACH TIME VALUE OF MONEY APPLICATIONS IN UPPER-DIVISION COST/MANAGERIAL ACCOUNTING CLASSES: DESCRIPTIVE STATISTICS

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ABSTRACT

This paper reports descriptive statistics from a survey investigating how and why time value of money topics are taught in upper-division cost/managerial accounting classes.

INTRODUCTION AND METHODOLOGY

Smith et al. [2] presented results of a survey showing how time value of money (TVM) topics are taught in intermediate accounting classes. This paper extends that work to upper-division cost/managerial accounting classes. Although present and future value tables were in wide use before the advent of computers and calculators, volumes of these tables are no longer published. Yet accounting textbooks still show applications of TVM calculations primarily with limited time value tables. When scientific calculators became available and popular, math, science, and engineering professors did not continue to teach the slide rule in their college courses nor expect students to master the slide rule. In many ways it seems that accounting professors have continued to use an obsolete slide-rule technology by continuing to use present and future value tables in their classrooms. While a number of reasons can be hypothesized for the continued use of tables, empirical evidence is needed to document which methods are used to teach TVM applications and why these methods are used. A survey methodology was used. The survey was modified from the Smith et al. [2] survey and includes 16 true/false items, 35 five-point items (Strongly Agree to Strongly Disagree), and several demographic variables. The mailing list was prepared from the *Accounting Faculty Directory 20062007* [1]. Of the 161 surveys received (21.2% response rate), 52 were excluded for various reasons.

DESCRIPTIVE STATISTICS

Demographic Items

Twenty-nine percent of the respondents were female, and 71% were male. The highest degree earned by the respondents was as follows: Ph.D.—67%, J.D.—1%, master's degree—29%, and bachelor's degree—3%. Six respondents reported teaching experience of less than five years, while 88% reported years of teaching experience between 6 and 30. Sixty percent of the respondents' institutions are public and 40% are private. The highest accounting degree offered at 43% of the institutions is a bachelor's degree, while 44% have master's degrees, and 13% offer Ph.D. degrees in accounting. The business or accounting accreditation status at these institutions is as follows: 56% are accredited by AACSB, 10% are in the candidacy status for AACSB accreditation, 18% have another accreditation, and 16% have no accreditation. Thirty percent of the institutions have three or fewer full-time accounting faculty, and 69% have nine or fewer faculty.

Teaching Methods Used

A large percentage of the respondents are using present and future value tables in their classes. Eighty-two percent teach the students how to use the time value tables. Eighty-three percent work sample problems in class using time value tables. Seventy-three percent use tables to illustrate the concepts of time value, and 81% provide time value tables for exam problems. However, these teachers are apparently not all requiring the students to use tables, because only 40% indicated that they assign only those homework problems that can be answered with tables. A much smaller group uses the algebraic formulas. Only 34% derive algebraic formulas in class in demonstrating the concepts of time value, and 43% are using the formulas to show how either tables or calculators work. Financial calculators are used by some of the respondents. Thirty-two percent of the respondents demonstrate how to perform time value problems using the functions on a financial calculator. Only 15% require their students to have a financial calculator, and only 15% use exam problems that require the use of a financial calculator. Fifty-seven percent of the respondents demonstrated how to use spreadsheets to solve time value problems, and 47% teach the students how to use the present value and future value functions in spreadsheet programs. In addition, 51% assign homework problems that must be completed using a spreadsheet program. However, only 13% have students use spreadsheets on exam problems

Reasons for Methods Used

Certainly teachers have reasons for the methods they use or do not use. The teachers' expectations about prior coverage may certainly affect the coverage in a given class. Fifty-six percent (52%) of the respondents agree that students should have mastered the concepts of present and future value of a single sum (annuities) before taking the upper-division cost/managerial accounting class, while only 28% (28%) disagree. However, only 10% agreed that they skip coverage of how to perform TVM calculations and require students who lack these skills to learn them outside of class on their own. Eighty-six percent of the respondents expect their students to use financial calculators during their careers (3% disagreed). Ninety percent expect their students to use spreadsheets for TVM calculations during their career (1% disagreed). Even with these high percentages, 62% felt students would have occasion to use the tables during their career (23% disagreed). When asked if the tables are archaic tools that have no place in modern accounting classes or textbooks, only 12% agreed (79% disagreed). Accounting faculty must see some pedagogical advantage to the tables to feel this strongly that they are useful in accounting classes. Fifty percent agreed that students come to a better understanding of TVM topics using tables than calculators (24% disagreed). Also, 61% agreed that students are less likely to understand how they made a mistake if they used calculators rather than tables (23% disagreed). However, most respondents did seem to understand that tables are less accurate. Seventy-four percent disagreed that time value tables provide more accurate solutions to problems than do financial calculators (3% agreed). Faculty comfort with tables is not necessarily the reason tables are used so much, as 47% disagreed that they were more comfortable with tables than calculators (41% agreed).

Survey participants also see an advantage in student understanding of the algebraic functions. Sixty percent agree that students need to understand the algebraic functions that underlie TVM calculations (27% disagree). Professional accounting exams did not seem to be a big factor in how TVM concepts are taught. Only 16% agreed that the manner in which the CPA or CMA exams have applicants perform TVM calculations greatly influences the use of classroom methods (57% disagreed). Some survey items measured how textbooks affect teaching methods. Only 27% agreed that the manner in which the textbook presents time value greatly influences how the concepts are taught in class (49% disagreed). A higher percentage of respondents, 40%, agreed that the types of homework and exam problems offered

in the textbook has an influence on teaching methods (39% disagreed). When asked about textbook support for financial calculators, the respondents gave mixed answers. Only 18% agreed that the lack of textbook support material makes teaching TVM concepts with calculators difficult (54% disagreed), but 39% agreed (compared to 19% disagreeing) that upper-division cost/managerial textbooks are generally inadequate in teaching the use of financial calculators for TVM calculations.

Survey respondents do see financial calculators as valuable to the students. Fifty-eight percent agreed that financial calculators are valuable tools that all accounting students should master before graduation (14% disagreed). Although 52% of the respondents agreed that students bring calculators to class that the respondents cannot operate without a manual (21% disagreed), only 12% agreed that the differences in keystrokes among the functions of various financial calculators impacts the decision to teach with calculators or not (72% disagreed). Only 18% felt that today's financial calculators would be outdated and archaic by the time most of their students complete their careers (39% disagreed). Finally, the cost of financial calculators was considered. Fifteen percent agreed that the additional cost to students for financial calculators is an important factor in determining which methods are used (60% disagreed). Survey respondents had mixed feelings about spreadsheets helping students understand TVM theory. Thirty-nine percent agreed that using spreadsheets will help students understand the theory behind TVM calculations (33% disagreed). However, lack of ability is apparently not a strong reason for faculty who do not use spreadsheets. Seventy-eight percent agreed that they were proficient in performing calculations with the TVM functions found in spreadsheet programs (14% disagreed). For some teachers, the lack of computers in the classroom or testing environment may affect the decision to teach TVM concepts using spreadsheets. Thirty-five percent agreed that the lack of computers in the classroom affects the decision to use spreadsheets (54% agreed). Thirty-six percent agreed that the unavailability of computers for exams affects the decision to use spreadsheets (52% disagreed).

LIMITATIONS AND CONCLUSION

One possible limitation of this paper is a bias in results toward smaller schools because of the method of selecting the names for the mailing list. In addition, the descriptive statistics by themselves tell only part of the story. More statistical analysis will be needed to determine how the demographic differences among respondents affect their survey responses. A significant number of teachers of upper-division cost/managerial teachers use either financial calculators and/or spreadsheets in some way in applying and having students work with TVM concepts. However, a very large percentage of these individuals still use present and future value tables to some extent, sometimes exclusively. A misunderstanding of the obsolescence of tables in the workforce may contribute to the usage of tables. However, it also appears that many teachers think that tables are an important part of the pedagogical process to help students understand TVM concepts and applications. Further research is needed to study the pedagogical implications of different TVM teaching methods to provide evidence that will either support or refute the methods used. Such research may improve teaching pedagogy and effectiveness.

REFERENCES

- [1] Hasselback, James R., *Accounting Faculty Directory 2006-2007*, Pearson Education, Inc., 2006.
- [2] Smith, Sheldon R., Steve Johnson, and Richard T. Henage, "How Time Value of Money Topics are Taught in Intermediate Accounting Classes," Western American Accounting Association Annual Meeting Proceedings, 2005.