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DEDICATED TO EFFECTIVENESS IN TEACHING FINANCE

**Creating a Capital Budgeting
Analysis Model in Excel**

**Using Library Resource Materials to
Integrate Deep Information
and Externality Impacts into
Semi-Live Finance Case Course Analyses**

**Managing the Free-Rider
Effect in a Top-Down
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**Learning about
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**Illustrating
Multiple IRRs Using
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**Preparing the
Statement of
Cash Flows
Using the Balance Sheet “Squeeze” Spreadsheet**

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Using Library Resource Materials to Integrate Deep Information and Externality Impacts into Semi-Live Finance Case Course Analyses

Michael D. Sherman and Julia Martin

This paper focuses on the manner in which business library research can be integrated into an upper-level case course in financial management to allow students to study the impact of externalities and what shall be referred to here as “deep information” in examining business decision making. The case class discussed herein analyzes firms contemporaneously, i.e., those facing current financial and operating situations. This differs greatly from traditional case courses that focus instead on historical company situations. In particular, the approach developed at The University of Toledo in its Advanced Financial Management course is examined. Tangentially, the interaction with other courses in the finance curriculum is also discussed. More particularly, the incorporation into the case analysis of the impacts of various factors that are outside of the control of a firm’s management, but that strongly influence and channel its performance, is showcased. Examples of these external factors include the impacts of economic trends and conditions, demographics, international developments, competition, and industry effects. In addition to research on external factors, two other areas in which library assistance can aid in the analysis of concurrent case companies include -- finding data and information that delves more deeply into company activities, e.g., by using corporate and other databases, and utilizing EDGAR to study the footnotes of a firm to uncover obscure and often less comprehensible issues behind its activities and behavior. In doing this, focus is placed upon the manner in which the synergistic efforts of the librarian and case instructor can effectively present and integrate this information into these contemporaneous cases to enhance student learning experience.

THE ROLE OF DEEPER INFORMATION AND EXTERNALITIES IN CASE STUDIES

When students are first assigned a case to review and analyze, their initial step is to turn to information locations about which they are most familiar. If it is a closed, historical case that is either published in a casebook or purchased through an institutional publisher, e.g., a “Harvard Case”, they will most likely just dive into the information prepackaged therein. If it is one that is a non-packaged, contemporaneous case, their first step will probably be to “Google” the company, turn to Wikipedia, or to go to a familiar source that deals with such firms, e.g., the company’s annual report and/or Yahoo Finance or Google Finance. The next step would be to download the financial statements of the firm to carry out ratio and other traditional analyses of it, to find articles about recent events associated with the firm’s activities, and to locate stock market data about its financial performance. After that, they’re often stuck!

The interaction of library instruction and assistance with that of contemporaneous finance case course teaching can overcome both this sudden impediment and, at the same time, provide a means for finance students to learn to investigate more deeply case company performance and the causes of it. It provides an opportunity for them to become familiar with the practical aspects of researching and analyzing the financial and operating performance of ongoing companies well-beyond the limits of more traditional case course settings. It further produces two other important related benefits; it gives them an appreciation of the importance of searching for and incorporating externalities into the real world of financial

analysis and decision making and some practice in carrying out such tasks prior to the time of their actually having to do so as company employees on the job. In fact, one of the major benefits of this approach to case company investigations is that the resultant reports offer a vehicle for students to attract the attention of the company the group has researched and analyzed as well as that of its competitors. This can thus be an important tool in their quest for employment in their field.

In order to accomplish these objectives it is important that the business librarian and the finance case professor work closely together. It is the job of the library instructor to present and discuss how to use the various sources of the available materials in these areas. At the same time, it is the responsibility of the case instructor to educate his/her students as to the manner in which that material should be integrated into and analyzed as a part of each case company assignment. Coordination takes place in three informational areas (deeper information, footnotes, and externalities), each discussed below.

Deeper Information

Typically, students in a contemporaneous case course will begin their search for financial performance data by first examining their assigned firm’s annual report. The data contained therein is often both limited and superficial. As an example, Table 1 below presents Deere & Co’s income statement (along with the prior statements for 2006 and 2007) as contained in its 2008 annual report. As highlighted therein, details of its revenue sources, some of its expenses,

TABLE 1. Demonstration of Financial Statement Detail from an Annual Report

DEERE & COMPANY			
Statement of Consolidated Income			
For the Years Ended October 31, 2008, 2007 and 2006			
(In millions of dollars and shares, except per share amounts)			
	2008	2007	2006
Net Sales and Revenues			
Net sales	\$25,803.50	\$21,489.10	\$19,884.00
Finance and interest income	\$2,068.40	\$2,054.80	\$1,776.80
Other income	\$565.70	\$538.30	\$487.00
Total	\$28,437.60	\$24,082.20	\$22,147.80
Costs and Expenses			
Cost of sales	\$19,574.80	\$16,252.80	\$15,362.00
Research and development expenses	\$943.10	\$816.80	\$725.80
Selling, administrative and general expenses	\$2,960.20	\$2,620.80	\$2,323.90
Interest expense	\$1,137.00	\$1,151.20	\$1,017.50
Other operating expenses	\$698.70	\$565.10	\$544.80
Total	\$25,313.80	\$21,406.70	\$19,974.00
Income of Consolidated Group before Income Taxes	\$3,123.80	\$2,675.50	\$2,173.80
Provision for income taxes	\$1,111.20	\$883.00	\$741.60
Income of Consolidated Group	\$2,012.60	\$1,792.50	\$1,432.20
Equity in income of unconsolidated affiliates	\$40.20	\$29.20	\$21.00
Income from Continuing Operations	\$2,052.80	\$1,821.70	\$1,453.20
Income from Discontinued Operations			\$240.60
Net Income	\$2,052.80	\$1,821.70	\$1,693.80
Per Share Data			
Basic:			
Continuing operations	\$4.76	\$4.05	\$3.11
Discontinued operations			\$0.52
Net Income	\$4.76	\$4.05	\$3.63
Diluted:			
Continuing operations	\$4.70	\$4.00	\$3.08
Discontinued operations			\$0.51
Net Income	\$4.70	\$4.00	\$3.59
Dividends declared	\$1.06	\$0.91	\$0.78
Average Shares Outstanding			
Basic	431.1	449.3	466.8
Diluted	436.3	455.0	471.6
Source: Deere & Company 2008 Annual Report			

Table 2a. Demonstration of Financial Statement Detail from a Proprietary Database

Deere & Co.			
As Reported Annual Income Statement	10/31/2009	10/31/2008	10/31/2007
Currency	USD	USD	USD
Auditor Status	Not Qualified	Not Qualified	Not Qualified
Consolidated	Yes	Yes	Yes
Scale	Thousands	Thousands	Thousands
Net sales	20,756,100	25,803,500	21,489,000
Finance & interest income	1,842,100	2,068,400	2,054,800
Revenues from services	418,000	421,000	314,000
Investment income	9,000	21,000	83,000
Securitization & servicing fee income	3,000	6,000	23,000
Other income	84,000	118,000	118,000
Total other income	514,200	565,700	538,300
Total net sales & revenues	23,112,400	28,437,600	24,082,200
Cost of sales	16,255,200	19,574,800	16,252,800
Research & development expenses	977,000	943,100	816,800
Selling, administrative & general expenses	2,780,600	2,960,200	2,620,800
Interest expense	1,042,400	1,137,000	1,151,200
Depreciation of equipment on operating leases	288,000	308,000	297,000
Cost of services	357,000	295,000	248,000
Other operating expenses	72,000	96,000	20,000
Total other operating expenses	717,400	698,700	565,100
Total costs & expenses	21,772,600	25,313,800	21,406,700
Income (loss) before income taxes - United States	756,000	1,730,000	1,601,000
Income (loss) before income taxes -foreign	584,000	1,394,000	1,075,000
Income (loss) of consolidated group before income taxes	1,339,800	3,123,800	2,675,500
Provision (credit) for current U.S. federal income taxes	3,000	559,000	484,000
Provision (credit) for current U.S. state income taxes	12,000	60,000	40,000
Provision (credit) for current foreign income taxes	273,000	402,000	354,000
Total provision (credit) for current income taxes	288,000	1,021,000	878,000
Provision (credit) for deferred U.S. federal income taxes	246,000	74,000	-2,000
Provision (credit) for deferred U.S. state income taxes	10,000	3,000	8,000
Provision (credit) for deferred foreign income taxes	-84,000	13,000	-1,000
Total provision (credit) for deferred income taxes	172,000	90,000	5,000
Provision (credit) for income taxes	460,000	1,111,200	883,000
Income (loss) of consolidated group	879,800	2,012,600	1,792,500
Equity in income (loss) of unconsolidated affiliates	-6,300	40,200	29,200
Income (loss) from continuing operations	-	2,052,800	1,821,700
Net income (loss)	873,500	2,052,800	1,821,700
Weighted average shares outstanding-basic	422,800	431,100	449,300
Weighted average shares outstanding-diluted	424,400	436,300	455,000
Year end shares outstanding	423,242.38	422,296.27	439,636.11
Income (loss) per share-from continuing operations-basic	-	4.76	4.05
Net income (loss) per share-basic	2.07	4.76	4.05
Income (loss) per share-from continuing operations-diluted	-	4.7	4
Net income (loss) per share-diluted	2.06	4.7	4
Dividends declared per common share	1.12	1.06	0.91
Number of full time employees	51,300	56,700	-
Total number of employees	51,300	56,700	52,000
Number of common stockholders	27,925	27,803	27,631
Source: Mergent Online, 2010			

and data on a number of its other important performance elements are missing. On the other hand, Table 2 shows the same statements, but as presented in the Mergent Online (2010) database. A greater proportion of the data that is needed to more fully evaluate Deere's performance is presented there. Only the additional items in Table 2 are highlighted for comparison. Similar distinctions exist between the balance sheets from both sources. As well, these databases offer many other areas of information that are often missing from a firm's annual report. These include, but are not limited to: stock performance data, comparative competitive company data, recent related news information, insider and institutional holdings, cross-sectional domestic and foreign industry information, breakdowns of long term debt, and executive information including compensation.

Although the difference in the nature and degree of information detail differs from company to company and between that which is reported in their annual reports and in corporate databases, the added depth in the latter permits students to examine many more aspects of a company's performance than would otherwise be possible. As shown in Table 2 much greater detail as to Deere's revenue sources are provided therein. Elsewhere in the database are included breakdowns respecting product lines and country sources as well. This opens opportunities to explore diversification and international aspects of its sales. While cost of goods sold breakdowns are not provided anywhere, operating expense details are many times presented more definitively in database reports. This is especially the case respecting general expenses. This is an area of business activity that is often overlooked by students. This is because these are overhead expenses that are generally lumped together, often as "selling, general and administrative expenses". In many cases they represent large, poorly controlled elements of the cash outflow of firms, especially those that are in trouble financially. By being able to break out its components, students can assess the degree to which these outlays are out of control and where improvements could have and are not being made by the firm's executives. As will be seen in the next section on footnotes, breakouts dealing with elements such as research and development (shown unusually in both Deere's annual report and Mergent Online's income statements), executive salaries and benefits, depreciation and other non-cash expenses, bad debt, and advertising and marketing expenses can be focused upon directly and examined with the use of such databases. Similarly, deeper information can also be found in these databases dealing with components of a firm's balance sheets. These include receivables; inventories; property, plant and equipment; other assets; payables; accruals; debt and capital leases; and other liabilities. With this information students are then able to perform more fundamental analyses of turnover and aging, leverage, and breakevens as well as more detailed vertical and horizontal assessments of its financial statements.

In order for students to make the most beneficial and efficient use of these large databases, they must become familiar with their content and structure. To accomplish this it

is critically important that both the case professor and the business librarian work together in combining their foci as well as their teaching expertise. The library instructor should focus upon educating students as to the content of and accessibility into each database. The case instructor should focus upon the ways in which the students can use this information and data to analyze more deeply the financial and operating performance of their assigned company. In combining their expertise in this way students gain exposure into these databases, to their unique features and details, and to the manner in which reports and exhibits can be generated from them. These will primarily be functions that the business librarian will carry out. It is then up to the case instructor to integrate this knowledge into the content of his/her class lectures as to the methods of analysis and utilization of this material and as to the manner in which it should be integrated into the case presentations and reports. The case instructor needs to be clear as to what is expected from them in using these data and information in their analyses and should tie these together with the lectures that were given by the library instructor. In this regard it is often quite beneficial for the two instructors to be present in each others' classes when this material is being covered and to integrate their presentations at this time.

Footnotes

The notes to a firm's consolidated financial statements are found in the 10-K report required to be filed annually with the Securities and Exchange Commission (SEC) by each publicly traded company doing business in the United States. These filings can be accessed directly through the SEC's Electronic Data-Gathering, Analysis, and Retrieval (EDGAR) system. Footnote information can sometimes also be found in the back of the annual reports of some firms. It is one of the most critical areas students should study in preparing their analyses of a company's activities, performance, and potential. This is because this information greatly expands upon and explains more deeply the financial aspects of a firm's underlying actions and activities. However, it is perhaps one of the least understood areas of financial analysis in that the subject of footnote analysis is generally not covered in finance classes. It is, however, sometimes focused upon in financial accounting courses. Therefore, finance students will only have knowledge of this area if they have taken this intermediate level accounting course.

In any case, the primary purpose of a firm's footnotes to its financial statements is to clarify and to expand upon the contents of those statements. In accomplishing this, they serve a number of important purposes. One of the most significant of these is to provide explanations of the principles of accounting used in the preparation of a company's financial statements. These explain the manner in which these are used to determine the amounts reported in those financial statements. The notes also provide breakdowns and analyses of certain accounts, and in that sense are sources of more detailed information. They also contain disclosures that are not included in the firm's financial statements. Some of the

most important of these is information dealing with performance by products, subsidiaries, and/or countries; regulatory infractions; lawsuits; and pending settlements of various financial issues. There are also breakdowns of sources of financing, tax issues, and what is commonly referred to as "off balance sheet" items. Thus, all of these, as well as others, make it critically worthwhile for case students to take the time to review them as part of their preparation of their reports. In doing so, they will gain critical insights into the company's true financial status as well as the potential consequences and effects of events reported therein.

While there is no standard format for the notes to a firm's financial statements, there are some general categories of information and disclosures that can be found in all of these. The form and content of the notes will vary from one company to the next, and if one is looking at the financial statements of a non-U.S. company, one may find disclosures that apply in that particular company's circumstances in the U.S. versus its country of origin.

In general, it is the task of the finance professor to present this information to his/her students. However, the business librarian can assist in this process by guiding students through the procedures necessary to locate the EDGAR site directly on the Internet and indirectly through the interactive databases that contain access to this site.

Externalities

Briefly defined in the context of this paper, externalities represent events that although they take place outside of a firm, have a serious impact upon it, and which are beyond the control of its executives. These include trends, conditions, or incidents that directly affect the performance of the case company, of which its executives may or may not be cognizant, but against which the executives can take no direct actions. Changes in economic trends and/or conditions, climatic events, disasters, regulatory decisions, changes in the political atmosphere, and international occurrences are just a few examples of such factors. Unlike the two areas discussed above which the case professor is more likely to introduce and discuss in terms of firm impacts, externalities are often best presented and discussed by the business librarian. By the very nature of their training and exposure, a librarian with a business and economics subject specialization has much wider exposure to data and information regarding these events. This is because of their education, training and the fact that they regularly provide assistance across campus disciplines to educators and researchers that request help in identifying and locating such details. Such information is often transferable among these specialties. These librarians are also much more knowledgeable as to where externality data and information can be found among research media sources, how it is presented therein, what methods and strategies can be used to locate and access such document and database sources, and as to the limits to which it is available and/or can be interpreted.

However, the case professor still plays a critical role in his/her working relationship with the librarian and with the students in the class. It is distinctly up to that person to provide the guidelines as to what type of externalities should

be focused upon in the library lectures and, to the students, why these topics are of special and/or critical importance to their analyses of their assigned case companies in assessing the impacts of these outside factors on the performance of them. Each type of industry is impacted by different sets of these external influences and in different degrees. These need to be pointed out by the teacher so as to clarify the unique nature and type of impact that students might expect a class of externalities to have upon their assigned company. However, it should be left to the students to search out and to delineate the specific factors and their influences upon their company's performance. Table 3 below provides examples of some of these externalities and the information sources that might be used by students to uncover such information. It also provides very brief examples of the type of impact each selected example might have upon an assigned case company. At the end of the paper in Exhibit 1 is an example of the handout that the UT library's business subject specialist hands out to students in the finance case class to guide them as to where to search for each type of externality by database or other information source.

METHOD AND PHILOSOPHY OF CASE COURSE IMPLEMENTATION IN THIS ENVIRONMENT

To achieve the goal of student exposure to and implementation of externality effects, a formal program within the finance case class structure has been developed. Students are first introduced to the concept of externality impacts as part of the overall case analysis lectures. At approximately the midpoint of the course, each student enrolled in the case course is required to attend a full lecture during class time on the sources and uses of externality data and information. This topic is taught in the library so that online resources can be easily accessed and hard copy reference sources can be passed around for the students to examine. Attendance is mandatory, and unexcused absence is penalized heavily. Exposure to the library's resources and to the research process teaches students to locate information and data. This assists them in defining the nature and uncontrollable effects of these externalities both in the past and potentially in the future. It also helps them to delineate their suggestions as to their assigned firm's future course(s) of action in the face of these. To do this successfully further requires a close and continuing interaction between the business librarian and the case finance professor who teaches these courses.

The case course philosophy within the finance department is that it serves as the capstone course for its undergraduate finance majors. (It is not a requirement for financial services majors.) Thus, its purpose is to bring together and to integrate all of the subject matter to which students have been exposed in their previously enrolled finance courses, both required and elective. It also serves as the mechanism by which they are exposed to and are expected to apply these teachings in real world settings just prior to their graduation into it. Thus, this course also serves as a transition vehicle for students in their final semesters to move from their long, almost exclusive exposure to the straight forward world of academic education

to the opposite world of open-ended pragmatic decision making; from a world where there are only specific, “right” answers to problems to one in which most of the time there are not; and from where there are specific courses of action to be taken to reach those specific conclusions to one in which the avenues to be taken are, at best, unclear and, at worst, unknown.

As a result, their transference from the academic settings in which most of their prior learning has taken place to that of its real-world application critically requires that students be exposed to and to learn to deal with the impacts of various elements of business environments that are not under the control of its managers.

This atmosphere and philosophy create situations in which the theoretical world of finance must be modified in several ways. First, within firms themselves, students must deal with the substantial difference between the relatively simple, straightforward structure of archetypal financial statements to the true complexity of the statements actually prepared within operating companies. Second, both within and without such firms, they must deal with a variety of pragmatic issues not covered in most finance courses. These include, but are not limited to, contingent obligations; regulatory requirements; and legal, environmental, securities, and tax restrictions. Third, they must take into consideration various business operating and financial philosophies and policies that may be inconsistent with the basic tenets of finance theory, e.g., non-traditional agency decisions, bankruptcy considerations, and non-optimizing behavior. Finally, they must give regard to the effects of externalities upon a firm’s performance and to the decision making of businesses and the executives that run them.

Much of what students learn elsewhere in financial analysis classes in the program is rigorous and up to date, but often does not explicitly incorporate the direct impacts of the specific external forces that influence and temper the application of these tools of financial management in business situations. This is not to say that this creates weaknesses in the program or that there is any fault with this approach. Course curricula must remain focused on finance and finance-related topics within each class in order to achieve the learning goals of its programs efficiently and effectively. And it must do so within the credit-hour limits set forth by the governing bodies of the finance department’s college and university. It is then one of the purposes of The University of Toledo’s Advanced Financial Management course to introduce and bring together, just prior to their graduation, the nature and influences of these external factors with the other elements of finance to which students have been exposed and are expected to have mastered, at least in part, in these other finance courses. Thus, the professor teaching this course must necessarily anticipate that students entering into his/her finance case class are generally not equipped to locate information dealing with externalities and their impact upon a firm’s financial and operating performance and the decisions that its business leaders must make.

FOCUS AND DESIGN OF THE FINANCE CASE COURSE USED AT THE UNIVERSITY OF TOLEDO

It is with these understandings in mind that the case course used in the finance department at The University of Toledo has been designed. As a result, its focus is very specific -- to concentrate on the practical applications of the concepts, theories, and methodologies taught in the rest of the finance curricula to real world business situations. This necessarily requires that this course make strong use of library instruction to achieve this goal. As part of this process the course professor and the business librarian must work together to develop strategies for choosing various types of data and information by which to analyze and forecast a case company’s performance as well as strategies for locating the sources of these relevant data and information to do this.

The course, itself, is “semi-live” in nature. That is, the case companies that are selected are examined contemporaneously in that they are evaluated “as they stand” today. However, unlike “live cases”, there is no direct involvement of the assigned case companies, and the executives who work for them play no role in the students’ assessments of the firm’s actual situations and performance.¹ However, students are encouraged to contact both the company and its executives directly, on their own, to ask questions and to request information they desire as they prepare their cases. This approach is very different from the traditional case approach in which historical cases are used in the course and taken from either casebooks or pre-prepared purchased cases available from institutional providers such as Harvard University or the University of Virginia.² The contemporaneous focus of these assignments necessarily creates a condition in which the case company outcomes are both unknown and evolving even as the case is being analyzed. In this way, neither the professor nor the students in the class know the eventual outcome of a case company’s situation. This makes the situations faced by the students realistic respecting the actual situations they will face and the decisions they will have to formulate for the rest of their professional careers. It also precludes the case professor from guiding the students toward predetermined objectives as almost always happens when traditional, historic cases are assigned in such classes. Nevertheless, historical data analyses are still required in this semi-live format. This is necessary in order to evaluate the past performance of the case company and the strengths, weaknesses, positive decisions and errors, as well as the outside factors that appear to have put the firm into its current state of affairs. These collectively allow each student team to determine the fundamental problems (strengths minus weaknesses) that their assigned firm must resolve in the future. Students are also required to formulate predictions of the future performance of their assigned firm using their recommendations for future corrections based in part on their analyses of the past and current information and data as well as their predictions of future trends in its performance. Importantly included in both of these assessments are the impacts of external factors on the firm’s performance.

Table 3. Examples of Externalities

Class of Externality	Externality Examples	Source of Data/Information
Economic Trends & Conditions	Employment	Stat-USA
	Monetary Statistics	Federal Reserve Bulletin
Demographic Trends	Population Characteristics	Census of Population
		Demographics USA
	Consumer Trends	Consumer Expenditure Survey GMID
Semi-External, Footnoted Effects	Mergers & Acquisitions	EDGAR
	Factored Receivables	
	Contingencies & Lawsuits	
Industry Effects	Industry Growth	IBISWorld
	Demand Forecasts	S&P Industry Surveys
	Cost Elements	Frost & Sullivan
Competition	Competitors & Brands	Mergent Horizon
	Suppliers & Customers	GMID
Legislative & Regulatory Decisions	SOX 2001	ViewsWire
	Healthcare Changes	
	Clean Air and Water Regulation	
Political Impacts	Federal & State Party Changes	Wall Street Journal
	National Elections	Barron's
International Trends & Conditions	Exchange Rates	ViewsWire
	Monetary Changes	OECD Publications
Climactic Trends & Conditions	Precipitation (rain, snow), Temperature, Wind & Related, Storms	NOAA
Securities Markets Performance	Stock, Bond, Other Securities Prices and Volumes	Wall Street Journal
	Securities Exchange Indices	Barron's
		FINRA
General Resource Materials	Background Company & Industry Information	Business Source Complete
* Exhibit 1 lists and describes each of the sources in Column 3 above.		

The use of external data and information is directly channeled into the student analyses in two ways. In the first half of the course students develop a “weighted SWOT analysis” of both the internal as well as external elements that they feel primarily impact the performance of their assigned company. This SWOT analysis is designed to begin to channel their team’s focus on these elements and to organize them in an orderly manner so that both the nature and degree of their effects on their assigned company’s performance is identified. While SWOT analyses are informal in nature, the weighting aspect provides a mechanism for each team to begin to quantify the specific impacts of each of these elements on their assigned company.

In the second half of the course, students carry out formal regression analyses that tie together those externalities that they feel directly impact various elements of the internal performance of their assigned companies. Each regression relationship is examined and several statistical tests are used to eliminate those factors whose impacts are weak. It is from these, in part, that each team develops its forecasts of its assigned firm’s future financial and operating outcomes.

The final stage of the course involves compilations of the results of the findings and recommendations into valuations of the firm’s performance. Included are both historical findings (based on the first half of the course results and suggestions for improvement) and future projections (based on the second

half of the course and forecasts for the firm and the application of the first-half recommendations). Each of these are prepared as separate net present value assessments of the value of their assigned firm, one based on its historical performance and the second based on that of expected future results. These are then compared to the firm's current market capitalization to offer a decision as to whether or not the case course professor's mythical private equity firm should make an offer for all or a portion of the company and at what price and market capitalization to do so. Table 4 below provides a timeline summary of the scheduled assignments required in the UT finance case course.

The class is largely open-ended as to the manner in which student teams are to assess and make recommendations to improve the financial and operating performance of their assigned case companies. As shown in Table 4 below, while general subject guidance is given to students, specific strategies for analyzing their companies are not. They must research and study their assigned company to determine what issues they must consider and the manner in which they feel

company executives should deal with them. Assigned companies are examined in their actual, concurrent operating environment. Thus, as a part of this process, students must locate and examine the very latest financial and operating data available (i.e., latest quarterly information) for these companies. In addition, they must analyze its historic data in order to assess the nature and quality of past performance in their roles as pre-determinants of its current situation. Finally, they are required to develop a three-year forecast of their assigned firm's future performance based in part on their recommendations for specific improvements in and control of their financial, operating, and other related activities. The overall semester focus is for each group to develop and support an acquisition recommendation and offer price, if at all, for their assigned firm to be presented to the executive board of a mythical private equity fund, viz., the course professor. A critical, congenital part of this process is their assessment of the impacts of specific externalities that are beyond the control of their firms' executives, but that affect those businesses in important ways.

Table 4: Case Study Timeline, Historical-Current Analysis

I. Historical - Current Analysis of Semi-Live Case Company
a. Groups choose three companies from a predetermined industry list of firms. b. Students visit library for initial instruction in locating information resources for internal and external economic, demographic, etc. analyses. c. Groups create a weighted SWOT analysis of internal and external factors of their assigned firm. d. Groups develop estimates of current performance from reported quarterly performance data. e. Groups carry out ratio analyses and more advanced analyses of their assigned company. f. Each group develops recommendations for the current actions and improved future performance of their assigned company. g. Groups submit Project I report and present findings to class.
II. Current - Future Analysis and Valuation of Assigned Semi-Live Case Company
a. Students visit library for follow up and more advanced instruction in information resources respecting the future performance of their assigned companies. b. Groups perform formal regression analyses and statistical tests on external factors' impacts on company internal performance parameters c. Groups conduct other forecasting methodologies combined with recommendations to complete forecast of company future performance. d. Groups determine their firm's historic and current costs of capital and market capitalizations. e. Groups produce net present valuation assessments of their assigned firm's historical and forecasted future performance. h. Groups submit Project II report and present findings to class. These include recommendation of mythical private equity firm (the professor) to purchase whole, portion, or none of the company.

DIRECT APPLICATION OF EXTERNAL DATA

As briefly discussed above, externalities are incorporated into the analysis of each assigned case company in two ways. In the first half of the class students prepare a weighted SWOT analysis that includes an evaluation of the impacts of various relevant external factors on each of these firms. The second half utilizes regression analysis to assess these impacts

more directly and with respect to the internal elements that they affect. This section reviews both of these processes and the role and interaction of the business librarian in accomplishing these assignments.

WEIGHTED SWOT ANALYSIS

The weighted SWOT analysis (Strengths, Weaknesses, Opportunities, and Threats) used in the case course has been

modified to include a separate, fifth quadrant so as to deal directly with the unique impacts of external factors on a company's performance and their interactions with the other four quadrants. Accordingly, this fifth quadrant is identified as the "Unique External Impacts" quadrant. Included herein are such non-diversifiable impacts as economic recessions, changes in the demographic characteristics of the population, changes in the political atmosphere, and international developments. Although SWOT traditionalists might well include these as part of their Opportunities or Threats quadrants, the items included in this fifth quadrant are all more global in their widespread impacts upon all firms that are exposed to them. Overall, the SWOT approach provides a means for students to directly inject the impacts of these external influences into the preparation of their case company analyses. In general, SWOT analysis is not covered in most finance classes. However, it is regularly presented and developed in strategy courses in management departments. But as presented therein the content of the discussion is mostly anecdotal and without direct application. As a result, students learn there to introduce only lists of outside factors in their SWOT analyses. The weighted SWOT analysis approach, instead, forces students to formally and quantitatively assess the effects of both internal and external factors on the financial and operating performance of their assigned case companies. The ultimate goal in developing their laboratory evaluations is to begin to formulate recommendations as to how management should have handled these as part of their financial resolutions. Thus, in the case course, students get a chance to apply SWOT analysis more formally to finance case situations and, at the same time, to focus more specifically upon the impact of various externalities in the evaluation of their assigned companies.

The process by which this is accomplished is that teams can select no more than six items per each quadrant of their SWOT analysis. They are then required to weight these in terms of their relative importance within their respective quadrant with the sum totaling 100 percent. They then use a modified Likert Scale to rank the performance of their company respecting each of these components on a continuum from zero (total lack of performance) to five (full performance). The ranks are then multiplied by the weights for each and then summed. This provides opportunities by which to compare the overall weighted totals for each sector and to examine the relative effectiveness of each of their components to those in another of the remaining four quadrants. In this manner, SWOT analysis becomes an important tool in quantitatively assessing a firm's performance from a variety of less traditional and often qualitative perspectives.

REGRESSION ANALYSIS

Regression analysis provides an even stronger, statistical test methodology for evaluating the role of external factors in the internal performance of an assigned case company than does SWOT analysis. Thus, in the second half of the course, students employ this approach to examine the strength of historical relationships between each of the identified external

SWOT quadrant members and the performance outcomes of specified internal elements of their target firm's financial statements. Because income statements reflect the current activities of a firm, their components are much more sensitive to trends and changes in external conditions than are those in a firm's balance sheets. Among the most affected elements of income statements are sales revenue, cost of goods sold, and interest expense. It is in part from these resultant regression equations that forecasts of future firm performance can be generated by student teams.

A generic example of this is shown in equation (1) below. The maximum number of variables allowed, based on sampling theory, is five. Accordingly, this sample equation presents a typical set of variable classes from which the students conduct their regression tests for a sales revenue dependent variable.

Students conduct definitive statistical tests on the quality of specific variable relationships using t-tests, F-tests, adjusted R² tests, tests for multicollinearity, and Durbin-Watson tests for serial correlation. Those variables and/or equations that fail to meet these statistical tests are eliminated. Thus, the results that are produced have been carefully examined and the quality of impacts linearly specified. These are then used by the students to produce forecasts of the future impacts of these variables on the performance of their firm.

EQUATION 1

$$\begin{aligned} \text{Sales} = & \alpha + \beta_1(\text{Economic Variable}) \\ & + \beta_2(\text{Demographic Variable}) \\ & + \beta_3(\text{International Variable}) \\ & + \beta_4(\text{Merger \& Acquisition Dummy Variable}) \\ & + \beta_5(\text{Other External Variable}) \end{aligned}$$

FINANCE-RELATED INFORMATION AND THE INTERACTION WITH THE BUSINESS LIBRARIAN

There are a number of unique differences and/or requirements involved in library instruction to students enrolled in a finance case course versus to those enrolled in other types of courses and/or disciplines. These require that the business librarian prepare differently in supplying data and information to them. Three fundamental considerations must guide the process. First, they must recognize that such finance students necessarily require much more quantitative data and information to prepare analytical assessments of their assigned case firms than do other students who often primarily seek journal articles and other qualitative information to support their research assignments. Second, these librarians implement generally accepted learning principles and promote the goals of information literacy, which The Association of College and Research Libraries (ACRL) promulgates. Business librarians, furthermore, are also very aware as to how information literacy standards fit into the broader general knowledge standards specified by The Association to Advance Collegiate Schools of Business (AACSB). Finance case students must stretch their analytic skills, one of the standards advanced by both organizations, much more than most students when searching for information. They have far more options to consider when looking for data on independent variables.

Finally, resource availability, including proprietary information to which the library subscribes and free information on the Internet, necessarily shapes the list of resources to which students are introduced. The danger of information overload, a particular problem with the many potentially useful resources available to finance case students, is guarded against. Thus, in working with finance case students the business librarian must devote a substantial effort to dealing with these considerations.

DIFFERENCES BETWEEN FINANCE CASE CLASSES AND OTHER USERS OF LIBRARY INFORMATION

The finance case classes that attend library research sessions require unique forms of information. Most students who arrive for a class at academic libraries seek academic journal literature and, perhaps, specialized texts. For example, both freshman English classes and graduate research classes require such materials. As might be expected, the graduate requirements are at a higher and more rigorous level. On the other hand, business students, most of whom are management and marketing majors, primarily use the library to find trade journals, industry reports, and other forms of information that are uniquely relevant to their needs. Finance students in such courses as financial institutions, international finance, and small business finance generally seek company financial statements and descriptive materials dealing with theoretical, operational, and/or regulatory issues to elaborate upon concepts learned in their classes.

The case course finance students' needs stretch much farther. As with management and marketing students, they require trade articles and industry reports to explore their assigned companies' environments. Additionally, they need company financial statements, as is the case with accounting and other finance students. However, they take another step and mine additional resources in order to carry out the deeper financial analyses required in a case course. Finance case students require specialized raw data for modeling and analysis. This often extends their searches for information to government and trade association data, preferably in a time series format. Only the finance case study students regularly require both the qualitative data found in trade articles and industry reports and the quantitative information found in financial statements, library databases, and government datasets. This is especially important in a semi-live case where current data must be unveiled.

INFLUENCE OF PEDAGOGY AND STANDARDS FOR INSTRUCTION

On the surface, the librarian's goals may appear simple: to introduce students to library resources and to support faculty teaching. However, general teaching methodologies and concepts of information literacy and life-long learning, as postulated by the ACRL, guide the librarian's approach to teaching students. Librarians differentiate instruction by addressing multiple learning styles, including visual, auditory, and kinesthetic. Visual learners respond well to text and pictures, which are seen in the resource guide (See Exhibit I) and when resources are demonstrated in the library lecture

session. Screenshots of primary resources are included in the handout to support the text and to aid visual learners. Auditory listeners are assisted not only by the lecture, but by the librarian and the case finance professor asking questions and encouraging small groups to work together. Many business school assignments, including those involving finance case studies, lend themselves to an auditory learning style. Kinesthetic learners learn by doing. For these types of learners providing computers and time for students to conduct searches on their assigned companies during the library session increases opportunities for learning and retention of information.

The stages of information literacy start with recognition of an information need, proceed to finding information to fulfill it, then to analyzing the usefulness and authority of the information itself, and conclude with the use of the information to satisfy that need.³ Table 5 below compares the AACSB's recommended general knowledge and skill learning experiences (2010, pg 70) with that of the ACRL's information literacy standards for higher education (2000, pg 2-3). Both lists therein are as presented in each of the organizations' policy guides. Categories were matched as closely as possible for comparison purposes. Though the ACRL's information literacy standards are narrower than the AACSB's general knowledge standards, these concepts complement each other. Thus, the AACSB's requirement of analytic skills could be seen to include the ACRL's desire for students to determine the extent of information needed and the evaluation of the information and its sources. However, the analytic skills of finance case students are more extensively tested than are other students when conducting library research. Finance case students have far more information resources to consider and must weigh the appropriateness of the available data against the case challenges which they must face. Utilizing library databases could be considered as meeting the AACSB's information technology tool standard that students need to master. As well, incorporating selected information into one's knowledge base, an ACRL standard, can be seen as meeting the AACSB's reflective thinking skill requirement.

Communication abilities, or using information to accomplish a specific purpose, can certainly include preparing a written report and delivering an oral presentation. Ethical understanding is demonstrated by citing sources used in their reports. There are, however, two AACSB standards, multicultural and diversity understanding and the dynamics of the global economy, that do not relate directly to the ACRL's information literacy standards. With these complementary goals, it is crucial that the case teacher and the librarian together guide students to meet both sets of standards.

As the AACSB standards focus on students being prepared for future positions in business, librarians help them to develop skills for life. While in school, library resources are a tool for completing a classroom assignment, but they also represent real world information and sources that students can access forever. As such, library instruction moves students beyond the limited world of the textbook to offer them a special opportunity to develop research skills that are highly

valued both by the business world and by the dynamic society in which they will live for the rest of their lives. To examine the internal operations of a company and the external factors that act upon it, students use many of the same information resources and analytic tools that they will use during their careers. In an ideal situation, students will develop an understanding of information needs, the organization of information, and their varying reliability. This will enhance their ability to apply research skills outside of the structured environment of the classroom, where textbooks and classroom professors are far less, if at all, available to them.

RESOURCE AVAILABILITY

The multitude of available resources, even without expecting students to purchase information, can be overwhelming. It should be noted that low funding and steadily increasing costs have restricted collection development at many universities across the nation. Nevertheless, libraries continue to acquire a targeted amount of periodical literature, company and industry information, and data. Library presentations often feature proprietary information which is purchased with class assignments in mind and goes far beyond what students are likely to find in a Google or other online search. Even when students do

discover a good source in Google, its interface can be difficult and confusing to use without some initial instruction. The content of specialized databases is often hidden behind complex search pages with no clear indication of the kind of information that might be available. Moreover, in many cases the Google recommended site is only accessible at a high cost because the library does not subscribe to it. Unfortunately, Internet searches often lead students to sites that lack authority. Some resources, especially historical data, are only available in print. However, electronic resources are rapidly replacing print. As a result, electronic resources have become the focus of instruction. They have done so, as well, because of their convenience, ease of use, and acceptability to students.

Of particular note, the U.S. government publishes large amounts of information, especially as datasets and databases. For example, various government agencies compile data on such things as population and demographic trends and changes, consumer spending habits, measures of business and economic performance, and international development and growth. In addition, they publish less well known data dealing with various aspects of the weather and climatic change. Once students are made aware of the free and ready accessibility of government data and of its broad scope, it will benefit them both now and after graduation. The free Internet also offers

Table 5. A Comparison Of ACRL Information Literacy Standards With AACSB General Knowledge Standards

ACRL Information Literacy Standards	AACSB General Knowledge Standards
Determine the extent of information needed	Analytic skills
Access the needed information effectively and efficiently	Use of information technology
Evaluate information and its sources critically	Analytic skills
Incorporate selected information into one's knowledge base	Reflective thinking skills
Use information effectively to accomplish a specific purpose	Communication abilities
Understand the economic, legal, and social issues surrounding the use of information, and access and use information ethically and legally	Ethical understanding and reasoning abilities
---	Multicultural and diversity understanding
---	Dynamics of the global economy

access to state government research, limited trade association data, and in some cases provides a peek at the expensive information offered by for-pay services. Thus, with some persistence, students are able to find information that matches or substitutes for the data they seek. Table 6 highlights some of the resources used by most finance case students. To assist them in this process, each student attending the special library class is given a resource guide that describes a variety of suggested information sources (see Exhibit I online at www.jfcr.org/jitf.html).

One of the most difficult challenges of information gathering for students enrolled in the semi-live case course is information overload. With every team researching a

different situation, an attempt to present a sufficient variety of resources of potential value to each case can result in an overwhelming number of resources confronting them. Thus, the business librarian must be vigilant in researching the sources needed by the students each semester. The librarian must work closely with the case professor to determine which sources are relevant and to carefully include new ones as they are acquired by the library. As well, they must pare down those that are no longer available. Thus, continued evaluation and coordination is necessary in order to match students' core needs with their time constrained capacities to absorb and utilize these sources.

Table 6. Highlighted Resources

Resource	Focus
Mergent Online	Provides business information, including financial reports
Thomson One Banker	Offers access to quotes, earnings
StatUSA (from the U.S. Department of Commerce)	Contains economic, business, and
U.S. Census Bureau Surveys	Brings together U.S. demographic and economic data, including population
Consumer Expenditure Survey (from the BLS)	Shows buying habits of Americans
Econstats, Economagic	Provides economic statistics from U.S. government agencies and other sites.
Business Statistics of the United States	Offers comprehensive historical government economic data.
Federal Reserve Bulletin, and various publications from the regional FR banks	Provides monetary information and data.

The problem of information overload exists in the context of both libraries (Reichardt and Cox, 2006) and the business world (Eppler and Mengis, 2004). Bawden and Robinson (2004) offer solutions for taking control of the information environment. Some of their solutions include time management, critical thinking, information presentation, information organization, use of filters, and satisficing (rationally deciding which pieces of information will be good enough to complete the assigned project). Huett and Sims (1997) offer practical advice for library sessions for business students, including splitting library sessions and short exercises to increase retention of information. Librarians try to present quality information sources in an organized format and to demonstrate the sources' internal filters to limit information overload. By suggesting a limited number of potentially valuable options and demonstrating their functionality, librarians attempt to reduce the time students need for research and to promote successful acquisition of information.

CONCLUSION

In this paper we have attempted to show how information that is largely exogenous to a company, but that impacts its performance, can be effectively introduced to students assigned in a case course to incorporate it. We have further indicated how important this material is to the full and proper financial and operating analysis of a company's management going through the everyday process of successfully guiding its activities and performance. The integration of externalities into the case learning process is especially relevant where semi-live cases are utilized because of the propinquity and immediacy of their impact. The successful accomplishment of this goal necessarily requires the close coordination of the finance case professor and the business librarian. They are especially challenged because students enrolled in finance case courses must deal with the unique task of applying

textbook learning to real, current situations where outcomes are unknown and there are no "right answers"; something that they will probably not have faced before in an earlier class. The finance faculty member and the business librarian face the challenge of guiding students through making that connection and ultimately dealing with this relationship throughout their professional futures.

In semi-live cases there are no historically prepared authored outcomes to look back upon in guiding the students' research, analyses, and conclusions. While these can be founded to some extent upon past trends and results from the assigned company and others, each current situation is based on new perspectives and somewhat different environments. This is what graduating students will face throughout their professional lives and, therefore, what necessarily challenges those teaching this type of case course. Therefore, a good rule for both the case professor and the business librarian to follow in this educational process is as follows: *students that have enrolled in the case course up to this time will have spent their first 21 - 25 years in an academic classroom setting. They will spend the next 50 years in the real world setting of business.* Accordingly, it is important that these two educators collaborate closely with this tenet in mind.

NOTES

1. For incisive discussions of the use of "live cases" versus that of historical ones, see Simpkins (2001) and Johnson & Helm (2008).
2. While there is no specific discussion of the concept of "traditional cases" in the literature, a number of authors discuss them in terms of "teaching applications" and "structuring". (See, for example, Trahan, 1993; Booth, et.al., 2000; Nunnally and Evans, 2001; and Klebba and

Hamilton, 2007). Nunnally and Evans go even further and define “‘Harvard’ type cases as being quite open-ended and offer[ing] students the opportunity to analyze a financial decision situation in the context of several pertinent factors ...”.

3. Authority is a term regularly used by librarians to refer to the reputation and/or respect of an author or publisher. A source that has high authority is more highly trusted than is one with low authority. Librarians spend a large portion of their time training students to locate and evaluate the authority of information sources. In this way the quality of the research is promoted.

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Managing the Free-Rider Effect in a Top-Down Security Analysis Course

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As an example of managing the free-rider problem, we report our experiences related to integrating group work associated with the top-down approach to fundamental analysis. Using group projects and sharing information with other groups and students is an effective method to reduce the work load for each individual student, while maintaining the scope of the top-down approach. By changing the composition of the groups at each level of the top-down approach, we are able to reduce the free-rider effect inherent in group projects. Overall, our methodology accomplishes the following three objectives: (1) reducing student workload, (2) sharing information, information sources, and analysis, and (3) reducing the free-rider problem. We find that 88% of the students agreed or strongly agreed that the top-down approach “had more educational value as a group project than as an individual project.” We also find that 82% of the students agreed or strongly agreed that changing the group composition helped reduce the free-rider problem.

INTRODUCTION

We use the top-down approach to illustrate several instructional techniques to manage the free-rider effect inherent in group projects. The top-down approach to security analysis (Reilly and Brown, 2009) typically involves evaluating in the following order: global economies, major markets (regions and/or categories), industries (or sectors), and a company. The analysis of each of the four components in a top-down approach by every student enrolled in the course would be an overwhelming task. By placing students in groups, the work load becomes more manageable. However, groups create a free-rider issue for the instructor. That is, some students do little or no work, knowing that a grade is assigned to the group and not to the individual. We describe our implementation of the top-down approach in a security analysis course and the instructional techniques we used to manage the free-rider effect.

Many universities have student-managed investment funds. These prestigious programs provide a great benefit to those students selected to participate. However, these programs have limited enrollment, and can select only a small portion of the student population to participate. Students selected tend to be highly motivated, willing to embrace the extra workload required in such a course. A student-managed investment fund operates as a transparent group in the analysis and selection of portfolio assets. The competitive environment drives each student to perform at a peak level. Hence, within such a course, personal accountability is the great motivator, governing the free-rider effect.

A top-down approach to a security analysis course allows more students to participate in the investment decision making process. Our use of groups allows students to apply the financial theories and paradigms taught in a security analysis course in a manner similar to the experience of a student-managed investment fund. Further, our group approach requires students to have personal accountability to their peers, which reduces the free-rider approach. In addition to market efficiency, most security analysis courses include exposure to various investment paradigms, such as fundamental analysis and technical analysis. The focus of this paper (and our security analysis course) is on fundamental analysis, specifically the top-down approach.

In the next section, we describe the course requirements for the four components of the top-down approach and how groups are formed for the three group projects. Next, we discuss how we manage the free-rider effect for both the group projects and the individual company report. After discussing the results of student survey questions, we present our concluding remarks.

COURSE MANAGEMENT

First Group Project: Global Economic Analysis

At our university, the prerequisites for the security analysis course are the introductory finance course and an investments course. Typical enrollment in the security analysis course is 30 students. During the first week of the security

analysis course, the instructor reviews the top-down approach. In the second week, we begin the first step in the top-down approach, the global economic analysis.

For the global economic analysis, we divide the students into four Global Groups (because the class size is about 30 students, each group has 7 or 8 members). Each Global Group is assigned a group of countries, such as: North America, Europe, Asia and the Emerging Markets. Each group is required to provide forecasts of real GDP for the world economy as well as for their assigned region (and the major countries in their assigned region). The Global Groups are given two weeks to complete their work, which includes posting their report on their region on a course management system (e.g., Blackboard) and an oral presentation of the analysis to the class. After each Global Group posts and presents its major findings and projections to the class, each student is required to evaluate and include the relevant information from all four groups in his/her company analysis.

Second Group Project: Market Analysis

Next, students conduct the market analysis phase of the top-down approach. We divide the students into six Market Groups (given the class size, each group has about 4 or 5 members). Each Market Group is assigned two indices. One assigned index is an equity-index corresponding to Morningstar's Investment Style, and the other is a major world index. After each Market Group posts and presents its major findings and projections to the class, each student is required to evaluate and include the relevant information in his/her company analysis.

Third Group Project: Sector/Industry Analysis

For the sector analysis, we divide the students into twelve Sector Groups (given the class size, each group has 2 or 3 members). Each Sector Group is assigned a sector, as defined by Morningstar. Each group must evaluate a sector using Porter's Competitive Forces model (Porter 1980, 1985) and incorporate data from other real-world sources (i.e., Morningstar and Value Line industry summaries, etc.). The main objective is for the group to predict the short-term and long-term growth prospects for its assigned sector. Each group also is required to predict the sector with the highest growth potential during the current year. After each Sector Group posts and presents its major findings and projections to the class, each student is required to evaluate and include the relevant information in his/her company analysis.

Company Analysis: An Individual Project

Finally, each student, individually, is required to perform and present a company analysis. We use the CFA Institute's template for the Global Investment Research Challenge, GIRC. However, we also incorporate additional material into the template. After discussing how to write a research report using articles like Wright (2010), students are provided with examples from the CFA Institute's web site. In addition to his/her written analysis, each student is required to make a five-minute presentation to the class.

MANAGEMENT OF THE FREE-RIDER EFFECT

We manage the free-rider effect by (1) randomly assigning students to the groups, (2) changing the group composition, (3) changing the group size, (4) requiring students to evaluate each student in their group, (5) requiring each group to make a group presentation with each member subject to being questioned by the class and/or instructor, and (6) requiring each individual to write and present a research report. Finally, near the end of the term when students are presenting their company analysis, we require each student to indicate which companies presented he/she would purchase and which stocks he/she would sell, based on the company reports presented that day.

Our university enrolls about 13,500 students, with approximately 2,000 students in the College of Business. Most of our students went to high schools in communities within a 100 mile radius of our location, are of traditional college age, and work approximately 15-20 hours per week. Students in the security analysis course are typically seniors, if not in their last semester of school, and they have had numerous finance and business courses with each other. As such, there is a high degree of familiarity and camaraderie amongst the students.

We address the student familiarity aspect of the free-rider issue by randomly assigning 7 or 8 students to each of the four Global Groups. Random assignment eliminates deliberate formation of groups of friends or those who attempt to align themselves with known high achievers. We use an unstructured group design in that we do not assign a leader for the group and we do not give any instruction as to how the groups are to operate. We expect each group to establish its own rules of operation. The unstructured nature of groups in our course is not a great concern to our students, given that most of them have had a formal introduction to group dynamics in previous core business courses in our BBA program.

The initial group is not a permanent group for the course. We change group composition two more times, such that each student is in three different groups, and in each group with different students. Changing groups increases the accountability of each student to others and reduces the tolerance of students for free-riders. In each of these subsequent groups, the Market Group and the Sector Group, we again do not assign roles for the group members. Each of these groups also must determine how it will operate to achieve its goals.

Within each group at all three initial levels, students receive a group project grade based on the posting and on the presentation. Each student evaluates each other student in his/her group, with the evaluation counting for 10% of that student's group project grade. Although an individual student does not know how the other group members evaluated him/her, the instructor does know the name of each evaluator and his/her evaluation scores. In addition, when the project is discussed in class, each student is asked at least one question about his/her group's conclusions. This answer represents 20% of the student's project grade. By the end of the first three stages of the top-down analysis, a student will have three

project grades. Evaluation of individual performance within the group comprises 30% of each of the three project grades. To date, we have not felt a need to alter the 10% and 20% individual grade components as a means of manipulating the free-rider effect. This remains an option for future offerings of the course.

In addition to changing the group composition to manage the free-rider effect, we also change the size of groups (and number of groups), gradually decreasing the size of each group from 7 or 8 students in the Global Groups, to 4 or 5 students in the Market Analysis Groups, to 2 or 3 students in the Sector Groups. The final project is an individual project, where each student must use information from previous steps to write and present his/her report. Our experience indicates that smaller group size reduces the free-rider effect by increasing the accountability of each student to the others in the group. With fewer students in a group, the importance of the work of each student becomes magnified. In a 2 or 3 person group, a free-rider is more likely to receive a lower evaluation from group members and from the presentation.

Finally, our approach deals with what we call a passive free-rider effect. In many situations, students may passively attend and ignore other groups' presentations. In many classes, what the other groups present is irrelevant to students not presenting. That is, the information posted/presented by those groups would not be needed by the student later in the course. In our application of the top-down approach in a security analysis course, each student must be an active listener to each group because each student must write and present his/her own final company report that must be backed up by and consistent with information posted/presented by other groups in the first three levels of the top-down approach. Second, during the last weeks of the semester, five to seven students present a five-minute company analysis to the class. In the last 15 minutes of each day of student presentations, each student in the class is required to submit a short, written report indicating which of the companies presented that day he/she would buy/sell, and provide a justification for his/her decision based on the information presented. These reports are another part of the student's grade. Students must be active listeners, and each student has peer pressure as an additional incentive to provide useful information.

STUDENT PERCEPTIONS

At the end of the spring 2009 and spring 2010 term, students enrolled in the class completed a survey about the integrated top-down approach with groups. Students indicated the education value of each of the course's group activities. Eighty-eight percent of the students from the 2009 course and the 2010 course either agreed or strongly agreed that the economic analysis provided more educational value as a group project than as an individual project. Similar results were found for the market and sector analyses. Although there are some neutral responses, half of the students either disagreed or strongly disagreed that the company analysis would have more educational value as a group project.

The students also believed that changing the composition of the groups reduced the free-rider effect. Over 82% of the students agreed or strongly agreed with the statement that “having the group members change for the economic, market and sector analyses helped reduce the free-rider problem that frequently occurs in group/team projects.” Only 6% of the students agreed or strongly agreed that having the same group members for all levels of analysis would have been a better educational experience.

CONCLUSION

We use groups in our security analysis classes to enhance the educational value of the top-down approach. We successfully incorporated a number of techniques to manage the free-rider effect. Specifically, we randomly assign students to groups, change the composition of the group for each project, require each student to evaluate other group members, and have each student use the information provided by each group and individual student. These techniques could be implemented as is, or in conjunction with other techniques that manage the free-rider effect. Our experience with using groups in this environment was positive for us as instructors and for the students because our methodology: (1) reduced the student workload, (2) allowed for sharing information, information sources, and analysis, and (3) mitigated the free-rider problem. In the end, all students are required to work in order to gain knowledge to earn a high grade in the course!

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Learning About Market Microstructure and Price Discovery Using Experimental Markets

Stephanie Y. Rauterkus and Andreas H. Rauterkus

This study introduces the use of an instructor-developed trading simulation to teach intrinsic value estimation, price discovery, and market mechanics. It provides the reader with a cost efficient solution to deepen students' understanding of financial markets and the price discovery process. By using a multi-week time frame we allow students to analyze the financial information of the companies in the simulation as well as to develop strategies to exploit the market structure and price discovery process. Thus, this simulation combines the importance of financial analysis with the awareness of the impact of liquidity and market organization on price discovery.

THE ROLE OF DEEPER INFORMATION AND EXTERNALITIES IN CASE STUDIES

Students are often interested in learning how to make money in the stock market and hearing stories of how savvy investors have parlayed spare change into great fortune. Finance professors, however must balance that enthusiasm with a thorough treatment of the risk-return tradeoff, market

efficiency and other key financial concepts. Successful students are able to apply this financial theory to investment practice. Institutions of higher learning are having great success in bridging the gap between theory and practice through innovative programs. These programs include the adoption of the Chartered Financial Analyst curriculum, acquisition of state-of-the-art computing technology and data feeds such as Bloomberg, Compustat and Reuters and the

launching of student-managed investment funds. Many colleges and universities house all of these resources under one umbrella – a finance ‘lab’. Whether housed in a specific physical location or achieved virtually with the use of technology, students and faculty can use the lab to access historical market data and analyze current investment decisions or attempt to better understand market behavior. Also, faculty can use this environment to simulate a financial market in order to observe behavior for both research and teaching purposes. Most of these market simulations can be classified in two broad ways. First, instructor designed games are developed and managed independently by an instructor. These types of simulations allow the instructor total control over the design and execution of the simulation. The second type of market simulations are commercial simulations provided by third party vendors. These simulations are mostly Internet-based and allow the instructor limited design options within the framework of the program. In recent years, much work has been done to create classroom innovations that enhance student learning and improve learning outcomes. Therefore, the use of trading simulations has soared and is used to accomplish many and different objectives, such as introducing option pricing theory, simulating commodity trading and getting to know the students.

In an effort to help students to bridge the gap between finance theory and investment practice, we develop a virtual trading floor utilizing two separate trading platforms. The new approach of this methodology is that we create a purely fictitious market that does not incorporate actual stocks but companies that were developed just for this purpose and students may trade these securities over a number of weeks³. Thus, the students create their own market where trade execution and price determination is based solely on the actions of the participants. In times of tight budgets this approach allows instructors to create a simulation similar to commercial trading simulations without the monetary expense. This exercise allows instructors to highlight the differences between trading and investing. Traders exploit the limit order book structure and the price discovery process. This exercise gives students an appreciation for these skills by forcing them to develop a trading strategy. Investors need to analyze the financial information that is provided to them. By only allowing limit orders, we force students to come up with a reservation price for each security based on their own analysis.

We conduct the exercise over a series of trading ‘rounds’ where some trading rounds are required and others are optional. Trades are ‘cleared’ on the same day each week allowing students a few days between trading sessions where no activity occurs. This gives them the opportunity to address weaknesses in their analysis or trading strategy before placing additional trades. Our anecdotal evidence suggests that the exercise provides students with a better understanding of how markets work.

SIMULATION

To implement this exercise, the instructor will need to first distribute the case instructions to the students at least one

week prior to the start of the case. We recommend that at least thirty minutes of class time be reserved for reviewing these instructions and outlining what students will be required to do. The instructions include:

- An overview of the case;
- A list of required dates that the students must trade;
- Instructions on how to place trades;
- Data on the firms that will be traded;
- A sample account statement; and
- An explanation of how student performance will be evaluated.

A full set of case instructions is included in Appendix A (see www.jfcr.org/jitf.html). Students are given profiles and fundamental data for three firms (SML, MID and LRG). We use three generic firms rather than actual firm names to prevent students from making buy/sell decision based on information that was not specifically given to them by the instructor. In addition, earnings announcements and other news that would trigger a buy/sell decisions are not available often enough for “real” companies to allow the experiment to be run within a 2-3 week time span. Individually, students are given their allocation of shares of each stock and cash (see Appendix B for an allocation matrix that can be used to assign initial student allocations). While not all students receive the same allocation of stock, cash or some combination of the two, all portfolios are initially valued at \$1,000,000.

Constructing the Limit Order Book and Clearing Trades

During each of the five weeks of the exercise, students may submit trades at any time. However, trades are only ‘cleared’ three times each week. Trading takes place over 13 non-consecutive trading days with each trading day simulating one calendar month. There are 13 total trading periods. After the cutoff time for each trading period (4:30 PM on Mondays, Wednesdays and Fridays), we compile all orders and construct a limit order book. To do this, we enter each trade in our Limit Order Book template. We sort the buy and sell orders separately such that the best bid (highest buy price) and best ask (lowest sell price) are at the top of the respective lists of orders. We then act as ‘specialists’ and set a ‘market clearing price’ in order to execute trades in a manner that clears as many trades for each stock as possible. We use the following logic to set the market clearing price:

- If the best bid price is less than the best ask price, we set the market clearing price at the midpoint between the two prices. For example, if best bid = \$28 and best ask = \$30, the market clearing price is \$29 and consequently no trades will clear.
- If the best bid price is equal to the best ask price, we set the market clearing price equal to this price. For example, if best bid = \$29 and best ask = \$29, the market clearing price is \$29 and all buy orders priced at \$29 will clear provided there is enough quantity available to be sold at that price.
- If the best bid price is greater than the best ask price, we rely on the specialist’s charge of setting a price that would clear the most trades. Therefore, we review the prices and quantities of several of the best buy and sell orders in our limit order book. We consider all possible prices between

the best ask price and the best bid price and determine the quantity of shares that would be exchanged at each price level.

We then send order confirmations to each trader and update each trader's brokerage statement (please see appendix C for an example of the brokerage statement). We use a set of Microsoft Excel templates to construct the limit order book for each trading period, brokerage statements for each participant and a summary of portfolio values across all participants by period. Copies of these templates are available from the authors upon request.

Earnings and News Announcements

'News' announcements are made each trading 'month' and 'earnings' announcements are made at the end of each trading 'quarter' (see a sample newsletter in appendix C). Students are required to place limit orders for all three firms prior to the first news announcement and after each earnings announcement. Students can purchase a news service which allows them to receive the newsletter and earnings information earlier than the other market participants. In addition, they receive exclusive news such as the CEO's opinion and earnings estimates.

Brokerage Statements

Borrowing and short-selling is allowed. Interest is paid on cash held and charged on borrowed funds. These charges and payments along with any additional charges for news subscriptions or penalties for failure to trade are reflected on the brokerage statements.

Assessment

At the end of the simulation, we calculate the mean and the standard deviation of the ending portfolio values. In order to provide an incentive to students, a portion of the course grade is based on trading performance. Students are instructed in advance that 15% of their course grade is based on their relative performance in the simulations. Grades are assigned as follows: When students are first assigned a case to review and analyze, their initial step is to turn to information locations about which they are most familiar. If it is a closed, historical case that is either published in a casebook or purchased through an institutional publisher, e.g., a "Harvard

Case", they will most likely just dive into the information prepackaged therein. If it is one that is a non-packaged, contemporaneous case, their first step will probably be to "Google" the company, turn to Wikipedia, or to go to a familiar source that deals with such firms, e.g., the company's annual report and/or Yahoo Finance or Google Finance. The next step would be to download the financial statements of the firm to carry out ratio and other traditional analyses of it, to find articles about recent events associated with the firm's activities, and to locate stock market data about its financial performance. After that, they're often stuck!

The interaction of library instruction and assistance with that of contemporaneous finance case course teaching can overcome both this sudden impediment and, at the same time, provide a means for finance students to learn to investigate more deeply case company performance and the causes of it. It provides an opportunity for them to become familiar with the practical aspects of researching and analyzing the financial and operating performance of ongoing companies well-beyond the limits of more traditional case course settings. It further produces two other important related benefits -- it gives them an appreciation of the importance of searching for and incorporating externalities into the real world of financial analysis and decision making and some practice in carrying out such tasks prior to the time of their actually having to do so as company employees on the job. In fact, one of the major benefits of this approach to case company investigations is that the resultant reports offer a vehicle for students to attract the attention of the company the group has researched and analyzed as well as that of its competitors. This can thus be an important tool in their quest for employment in their field.

In order to accomplish these objectives it is important that the business librarian and the finance case professor work closely together. It is the job of the library instructor to present and discuss how to use the various sources of the available materials in these areas. At the same time, it is the responsibility of the case instructor to educate his/her students as to the manner in which that material should be integrated into and analyzed as a part of each case company assignment. Coordination takes place in three informational areas (deeper information, footnotes, and externalities), each discussed below.

Table 1. Student Assessment Based on Relative Trading Performance

<i>Performance</i>	<i>Percentage Grade</i>
$< \mu - 3 \text{ SD}$	70%
$> \mu - 3 \text{ SD}, < \mu - 2 \text{ SD}$	75%
$> \mu - 2 \text{ SD}, < \mu - 1 \text{ SD}$	80%
$> \mu - 1 \text{ SD}, < \mu + 1 \text{ SD}$	85%
$> \mu + 1 \text{ SD}, < \mu + 2 \text{ SD}$	90%
$> \mu + 2 \text{ SD}, < \mu + 3 \text{ SD}$	95%
$> \mu + 3 \text{ SD}$	100%

CONCLUSION

When we carried out this exercise, the mean ending portfolio value was \$1,234,835.93 which represented a 23.5% total return. The standard deviation of ending portfolio values was \$117,761.60 – just under 10% of the mean ending

portfolio value. The minimum and maximum returns were 4.3% and 54.4% respectively. Using the grading scheme in Table 1, this resulted in all grades clustered between 80% and 95%.

In our experience, the exercise appears to add value to the student experience. However, instructors must be prepared to

invest a significant amount of effort into developing and executing customized trading cases. This is an ongoing cost in that trades have to be executed manually. However, in times of very tight budgets it is a worthy effort to provide students

with this valuable tool. The cost of commercial trading software might be prohibitively high for a lot of schools, but the learning experience for the students is worth the extra effort of the instructor.

NOTES

- 1 See McClatchey and Kuhlemeyer (2000) for a survey on what types of market simulations are used by faculty
- 2 For different simulations see for example Angel (1994), Cheng (2007), Maxam and Maxam (2003), Lyman and Stone (2006), and Cooper and Grinder (1997).
- 3 Our simulation is different from FTS in that FTS has two simulations one with real data called *The Real Time Trader* (where you can change the parameter, but it uses real market information and runs over several weeks) and one that is case based, called *FTS Markets*. This one is fictitious, but runs only for a few minutes per trial. The RE1 case used in this paper to compare student results is from that application.

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Preparing the Statement of Cash Flows Using the Balance Sheet “Squeeze” Spreadsheet

Robert B. Matthews, Joe James, and Ronald J. Daigle

The statement of cash flows (SCF), established pursuant to Statement of Financial Accounting Standards No. 95 (FAS 95), is perhaps the most useful of the standard financial statements—balance sheet (BS), income statement (IS), and SCF—in evaluating the financial viability of a company, particularly a small business. Unfortunately, the SCF is probably the least understood of the three statements and the most difficult to prepare, and is frequently not included in the financial statement compilations issued by accountants for many small businesses. This paper describes a spreadsheet methodology commonly employed in private industry to facilitate preparation of the SCF, which can be suitable for teaching accounting and finance students at the undergraduate level.

Understanding cash flow is essential for accurate analysis of the financial condition and viability of any enterprise. Among the standard financial statements specified by

Generally Accepted Accounting Principles (GAAP)—balance sheet (BS), income statement (IS), and statement of cash flows (SCF)—the SCF may be the most important of all, particularly in analyzing the creditworthiness of small businesses. Unfortunately, perhaps because the SCF is the one basic statement that is not prepared more or less directly from a trial balance, it is usually the last one taught to accounting students, and it is understood by very few non-accountants.

Accountants for many small businesses often omit the SCF (and footnotes) in preparing compilations of financial statements. This presents an obvious problem for users seeking to understand cash flow, such as bank lending officers charged with making small business loans. Such a user must either prepare a cash flow statement with the information available, or request such a statement be included in any additional information to be provided.

What is needed is a methodology that can be useful in preparing the SCF or in validating a SCF prepared by others.

The balance sheet “squeeze” is a method used widely in industry, but the authors have found little evidence of its being taught in universities. It offers the following advantages:

1. It can be learned and understood by anyone with a reasonable knowledge of spreadsheet techniques.
2. It provides a straightforward way to separate changes in cash among operating, financing, and investing activities.
3. The SCF can be prepared fairly directly from the completed squeeze.
4. Validating the SCF by reference back to the squeeze is a relatively straightforward process.
5. Since the method is widely used in industry, students who learn it at the university level will be better prepared to step into jobs after graduation.

One other advantage is that the squeeze provides a fairly straightforward approach to the more difficult, but preferable, direct method of preparing the SCF. In the interest of space, this article addresses only the simpler indirect method, but preparation using the direct method is addressed in the supplemental materials, including teaching notes and further examples, which can be found online at www.jfcr.org/jitf.html

PURPOSE, FORM, AND CONTENT OF THE STATEMENT OF CASH FLOWS

The Financial Accounting Standards Board (FASB) defines the purpose of the SCF as being, “to provide relevant information about the cash receipts and cash payments of an enterprise during a period” (SFAS-95, see also ASC-230 and IAS-7). FASB further states that the statement of cash flow, when considered along with the other financial statements and the related disclosures, should help investors, creditors, and others to assess:

1. The enterprise's ability to generate positive future net cash flows;
2. The enterprise's ability to meet its obligations, its ability to pay dividends, and its needs for external financing;
3. The reasons for differences between net income and associated cash receipts and payments; and
4. The impact on the enterprise's financial position of both its cash and non-cash investing and financing transactions during the period (SFAS-95, p. 4).

The general layout of the SCF is:

Cash inflows (outflows) from operating activities
 +/- Cash inflows (outflows) from financing activities
 +/- Cash inflows (outflows) from investing activities
 = Net cash flow
 + Beginning cash and cash equivalents
 = Ending cash and cash equivalents

A key to preparing the SCF is applying the following rule setting forth the relationship between the SCF and double-entry accounting:

Credit = Source/Inflow of Cash;
 Debit = Use/Outflow of Cash

This rule is simple and obvious. It applies primarily to non-cash accounts, but can be applied to cash accounts if one thinks mnemonically of taking money out of the bank as a “source” of cash, and putting money into the bank as a “use.” The following is a list of more detailed classification rules that apply generally in analyzing the changes in accounts other than cash and cash equivalents, with some specific exceptions:

Current assets - Debit changes (increases) are operating outflows; credit changes (decreases) are operating inflows
 Non-current assets - Debit changes (increases) are investing outflows; credit changes (decreases) are investing inflows
 Current liabilities – Debit changes (decreases) are operating outflows; credit changes (increases) are operating inflows
 Non-current liabilities – Debit changes (decreases) are financing outflows; credit changes (increases) are financing inflows
 Equity – Net income (loss) is an operating inflow (outflow); capital contributions (credits) are financing inflows; capital distributions (debits) are financing outflows

PREPARING THE SCF

The procedure for preparing the SCF generally consists of the following steps:

1. Determine the net change in each balance sheet account.
2. Segregate the changes in cash (and cash equivalents) from the changes in non-cash accounts.
3. Classify the changes in non-cash balance sheet accounts as resulting from operating, investing, and financing activities, where:
 - a. Operating activities can be reported applying either: 1) The indirect method, which reconciles net income to cash flow from operations and is most common, apparently because it is easier, or 2) The preferred direct method, reflecting cash received from customers, cash paid to vendors, and cash flows from other operating activities.
 - b. Investing activities include the cash effects of lending money and collecting on those loans and acquiring and selling investments and productive long-term assets.
 - c. Financing activities include the cash effects of borrowing and repaying long-term loans; issuing equity securities; and payment of dividends to shareholders.
4. Verify that the total of operating, investing, and financing changes equals the net change in cash.

The balance sheet squeeze provides a logical framework for applying the rules for preparation of the SCF. To demonstrate how the squeeze works, assume the following:

1. Table 1 shows ABC Corporation's balance sheets at December 31, 2009 and 2008.

2. Table 2 shows ABC's income statement for the year ended December 31, 2009.
3. During the year 2009, ABC did the following:
 - a. Purchased property and equipment totaling \$30,000.
 - b. Repaid \$4,000 of commercial paper outstanding at the beginning of the year.
 - c. Issued \$10,000 of new long-term debt, and repaid \$4,000 of long-debt outstanding at the beginning of the year.
 - d. Paid dividends of \$5,000.

To illustrate the use of the balance sheet squeeze, the following steps are helpful. In working through these steps it will be helpful to refer to Table 3, which is a completed balance sheet squeeze template based on the above facts.

1. Set up the spreadsheet. An Excel template is provided online at <http://www.jfcr.org/jitf.html>. The general layout of the spreadsheet is Column A-Balance sheet captions, Column B-Beginning balances, Column C-Ending balances, Column D-Changes from beginning to end, Column E-Changes attributable to operating activities, Column F-Changes attributable to financing activities, Column G-Changes attributable to investing activities, and Column H-Check column to capture any changes not spread between operating, financing, and investing.
2. Put the balance sheet captions in Column A, following the format in the company's financial statements.

3. List balances at the beginning of the year on the appropriate line in Column B. Insert debits as positive numbers and credits as negative numbers, regardless of the natural signage for individual accounts or line items in the company's financial statements.
4. List balances at the end of the year on the appropriate line in Column C. Again, enter debits as positive numbers and credits as negative numbers, regardless of the natural signage of the individual account in the company's financial statements. It is extremely important that the data in both columns B and C be entered in accordance with this convention in order for subsequent formulas to work properly. As a validity check, the following equations should be true for both columns B and C:

$$\begin{aligned}\text{Total Liabilities and Equity} &= -1 \times (\text{Total Assets}) \\ \text{Total Assets} + \text{Total Liabilities and Equity} &= 0\end{aligned}$$

If these are not true, resolve this error before proceeding further. The most common causes are a reversed sign (debit/credit) or omission of a line item.

5. In Column D, insert a formula to subtract the current year-end amount in Column C from the prior year-end amount in Column B (D6=B6-C6, D7=B7-C7, etc.). Do not include such calculations for lines containing totals or subtotals. Setting up the worksheet this way places the proper signs on the calculated amounts for inclusion.

Table 1. ABC Corporation's Balance Sheets, Fiscal Year 2008 & 2009

<u>Assets</u>	<u>12/31/2008</u>	<u>12/31/2009</u>
Cash and cash equivalents	8,000	32,000
Accounts receivable, net	100,000	102,000
Reserve for doubtful accounts	(10,000)	(11,000)
Inventories	92,000	96,000
CURRENT ASSETS	190,000	219,000
Property, plant, and equipment	250,000	271,000
Accumulated depreciation	(31,000)	(36,000)
TOTAL ASSETS	409,000	454,000
<u>Liabilities and Equity</u>		
Accounts payable and accrued liabilities	105,000	110,000
Income taxes payable-Current	15,000	17,000
Current notes payable	4,000	-
CURRENT LIABILITIES	124,000	127,000
Long-term debt	50,000	56,000
Income taxes payable-Deferred	-	1,000
TOTAL LIABILITIES	174,000	184,000
Common stock	10,000	10,000
Additional paid-in capital	90,000	90,000
Retained earnings	135,000	170,000
TOTAL EQUITY	235,000	270,000
TOTAL LIABILITIES AND EQUITY	409,000	454,000

While not intuitively obvious (this effectively reverses the convention observed in Columns B and C, so that an increase in receivables from the prior year to the current year will be reflected as a negative number in the change column), this convention results in the proper signs for inclusion in the SCF:

- a. Debit changes = Uses of cash = Negative numbers in SCF (although debits are positive numbers in Columns B and C)
- b. Credit changes = Sources of cash = Positive numbers in SCF (although credits are negative numbers in Columns B and C).

Column D must not include values for subtotal and total lines in order to facilitate an important validity check. If all balance sheet changes are properly accounted for, then the total of Column D must equal zero. If the total of Column D does not equal zero, resolve this error before proceeding further. To assist in resolution, the most likely causes of any errors are:

- a. Incorrect sign (debit/credit) in populating Columns B and C
- b. Inclusion of total or subtotal lines in Column D.
- c. Omission of non-total or non-subtotal line from Column D.
- 6. Continue to populate the template in this manner until all assets and liabilities are recorded and the net change in each is reflected.

Table 2. ABC Corporation Income Statement for the Year Ended Dec. 31, 2009

Sales	371,000
Cost of goods sold	224,000
GROSS MARGIN	147,000
Selling, general, and administrative expenses	87,000
Depreciation	6,000
	93,000
INCOME FROM OPERATIONS	54,000
Interest income	10,000
Interest (expense)	(4,000)
Gain (loss) on sale of assets	(2,000)
PRETAX INCOME	58,000
Income tax expense - Current	17,000
Income tax expense - Deferred	1,000
NET INCOME	40,000

7. In analyzing retained earnings, it will be helpful to split current year activity into its components. Therefore there would be a beginning balance line (where the prior year balance is shown on this line in the prior year statements), a net income line, a dividends/distributions line, and other lines as necessary to break out current year changes to retained earnings.

8. Next, add columns E, F, G, and H to the spreadsheet. Column E is for changes from operating activities, Column F for changes from financing activities, column G for changes from investing activities, and column H for any amounts in column D that are not spread to columns E, F, or G. The formula for column H is column D minus the sum of columns E, F, and G (i.e., $H7=D7-E7-F7-G7$). The net change in cash ends up in column H since it is not spread to columns E, F, or G (keeping in mind that a debit is a "use" and a credit is a "source" under this signing convention). Keep working until all noncash lines in column H equal zero. Zeros in column H-except the net change in cash (and cash equivalents)-indicate that all sources and uses of cash have been classified as operating, financing, or investing.

9. In our example, the following items are to be posted to the spreadsheet:

- a. Debit changes of \$2,000 to accounts receivable and \$4,000 to inventories are operating outflows (negative amts in Column E).
- b. Credit change of \$1,000 to reserve for doubtful accounts is operating inflow (positive amount in Column E).
- c. Debit change of \$21,000 to property, plant, and equipment is investing outflow (negative amount in Column G).
- d. Credit change of \$5,000 to accumulated depreciation is investing inflow (negative amount in Column G).
- e. Credit changes of \$5,000 to accounts payable and \$2,000 to income taxes payable-current are operating inflows (positive amount in Column E).
- f. Debit change of \$4,000 to commercial paper payable is financing outflow (negative amount in Column F).
- g. Credit change of \$6,000 to long-term debt is financing inflow (positive amount in Column F).
- h. Credit change of \$1,000 to income taxes payable-deferred is operating inflow (positive amount in Column E).

i. Net credit change of \$35,000 to retained earnings consists of several components:

- 1) \$40,000 net income is operating inflow (positive amount in Column E).
- 2) \$6,000 depreciation expense is operating inflow (positive amount in Column E), with offsetting investing outflow of \$1,000 (negative amount in Column G) to equal net change of \$5,000 in accumulated depreciation.
- 3) \$2,000 loss on sales of assets is reclassified from operating to investing (positive amount in Column E and negative amount in Column G).
- 4) \$5,000 dividend paid is financing outflow (negative amount in Column F).

Posting these amounts to the spreadsheet produces a net cash inflow from Operating Activities of \$51,000, a net cash outflow to Financing Activities of \$3,000, and a net cash outflow to Investing Activities of \$24,000. Note that the sum of the Operating, Financing, and Investing Activities columns produces a net source of cash of \$24,000, which is exactly the

amount by which cash increased. Once that verification is completed, we can be relatively certain that we have captured all elements of cash flow. Table 3 shows the completed spreadsheet. Note that the sum of the totals for columns E, F, and G is equal to the total amount for column H, but of the opposite sign. Note also that column H has zero values except on the line(s) attributable to cash (and cash equivalents). These are both important validity checks.

Now we must adjust certain components to reflect additional information, as follows:

- a. The \$6,000 decrease in long-term debt results from \$10,000 in new borrowings and \$4,000 of repayment of prior borrowings.

- b. With respect to property, plant, and equipment and related depreciation:

- 1) The \$21,000 debit change in property, plant, and equipment reflects \$30,000 in additions, less assets sold, so the cost of assets sold must equal \$9,000.

Table 3. Completed Balance Sheet Squeeze Template

A	B	C	D	E	F	G	H
ABC COMPANY	Dr (Cr)	Dr (Cr)	Source/Inflow (Use/Outflow)	<u>Operating</u>	<u>Financing</u>	<u>Investing</u>	(Increase) Decrease <u>in Cash</u>
BALANCE SHEET "SQUEEZE"	<u>Beginning</u>	<u>Ending</u>	<u>Of Cash</u>				
Cash and cash equivalents	8,000	32,000	(24,000)	-	-	-	(24,000)
Accounts receivable, net	100,000	102,000	(2,000)	(2,000)	-	-	-
Reserve for doubtful accounts	(10,000)	(11,000)	1,000	1,000	-	-	-
Inventories	92,000	96,000	(4,000)	(4,000)	-	-	-
CURRENT ASSETS	190,000	219,000					-
Property, plant, and equipment	250,000	271,000	(21,000)	-	-	(21,000)	-
Accumulated depreciation	(31,000)	(36,000)	5,000	6,000	-	(1,000)	-
TOTAL ASSETS	409,000	454,000					-
Accounts payable	(105,000)	(110,000)	5,000	5,000	-	-	-
Income taxes payable-Current	(15,000)	(17,000)	2,000	2,000	-	-	-
Current notes payable	(4,000)	-	(4,000)	-	(4,000)	-	-
CURRENT LIABILITIES	(124,000)	(127,000)					-
Long-term debt	(50,000)	(56,000)	6,000	-	6,000	-	-
Income taxes payable-Deferred	-	(1,000)	1,000	1,000	-	-	-
TOTAL LIABILITIES	(174,000)	(184,000)					-
Common stock	(10,000)	(10,000)	-	-	-	-	-
Additional paid-in capital	(90,000)	(90,000)	-	-	-	-	-
Retained earnings	(135,000)	(135,000)	-	-	-	-	-
Net income (loss)	XXX	(40,000)	40,000	40,000	-	-	-
Loss on sale of asset	XXX			2,000	-	(2,000)	-
Dividends paid	XXX	5,000	(5,000)	-	(5,000)	-	-
TOTAL EQUITY	(235,000)	(270,000)					-
TOTAL LIAB AND EQUITY	(409,000)	(454,000)					-
GRAND TOTALS	-	-	-	51,000	(3,000)	(24,000)	(24,000)
						24,000	-

2) The \$5,000 credit change in accumulated depreciation reflects \$6,000 in depreciation expense, less accumulated depreciation on assets sold, so the accumulated depreciation on assets sold must equal \$1,000.

3) The loss on sale of assets is \$2,000, so the proceeds from sales of assets must equal the cost of assets sold (\$9,000), less accumulated depreciation on assets sold (\$1,000), less the loss on sale (\$2,000), or \$6,000.

We now have sufficient information to prepare the SCF based on the indirect method, as shown in Table 4. The direct method is addressed in the online supplemental materials at www.jfcr.org/jitf.html

To reiterate, the most important points about setting up the balance sheet squeeze spreadsheet are to ensure that:

- a. Debit account balances are recorded as positive numbers and credit account balances are recorded as negative numbers in Columns B and C, regardless of the natural sign of the particular account.
- b. Total assets are equal to, but with opposite sign to, total liabilities and equity in Columns B and C.
- c. No amounts are calculated for total and subtotal lines in Column D.
- d. The total of all amounts in Column D equals zero.
- e. All amounts in Column D, except for the changes in cash and cash equivalents, are then spread to Columns E, F, and G, with the same signing convention maintained. Mathematical validity checks can be built into the spreadsheet.
- f. The sums of Columns E, F, and G, when added together, are equal to, but with opposite sign to, the net change in cash and cash equivalents in Column H. A relatively easy validity check can be built into the spreadsheet.

CONCLUSION

The statement of cash flows is critical to evaluating an enterprise's financial performance. Unfortunately, knowing of how to prepare the cash flow statement and understanding how to interpret it are not taught as commonly--or as well--as they arguably should be. The balance sheet "squeeze" approach provides a logical method for preparing the statement. This method is easily taught to students with basic spreadsheet skills, provides a straightforward way to separate changes in cash among operating, financing, and investing activities, leads fairly directly to preparation of the SCF, provides a relatively straightforward process for validating the

Note: Following the signing convention that we have used in preparing the spreadsheet, the signs (plus for sources/inflows, minus for uses/outflows) in the spreadsheet are retained when preparing the SCF. It is certainly possible to follow and alternate signing convention to avoid this, but the authors believe that of all the alternatives, the approach laid out here is the most straightforward. Note further that in the completed SCF, the total cash inflows/outflows from operating, financing, and investing activities equal the corresponding subtotals in the SCF. This is a useful check to ensure that the SCF is prepared properly.

completed SCF, and prepares students to step into the business world, where the method is widely used.

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Illustrating Multiple IRRs Using Excel and Financial Calculator iPhone Applications

Jose Gutierrez and Robert Stretcher

In recent years, the capability of handheld computing devices has developed into a compelling argument for calculator applications. This article summarizes two calculator applications for the iPhone, the Texas Instruments BA II Plus and the Hewlett Packard 10B II. The obvious advantage to the user for both applications is cost. The BA II Plus app is \$5.99 and the Hewlett Packard 10B II app is 14.99, both substantially less than the equivalent calculators. The HP app discussed here, though, substantially extends the base calculator's capability. We illustrate this capability in an exposition of the multiple IRR problem in capital budgeting using Excel, and then using the two calculator applications. The extended capability of the iPhone applications is equally applicable to many other exercises in finance and other disciplines.

NONCONVENTIONAL CASH FLOWS AND THE MULTIPLE IRR PROBLEM

“Conventional” project cash flows are defined as cash flows that consist of one or more net outflows followed by net inflows in all subsequent periods. In this case below, the project under consideration will have a single IRR. On rare occasions, however, projects may have what are referred to as “nonconventional” cash flows. Nonconventional cash flows are defined as those where a net outflow occurs sometime after the net inflows have commenced. Stated differently, if the sign change (negative to positive or positive to negative) occurs more than once, then the cash flows are said to be nonconventional. In this atypical case, the project under consideration may have multiple IRRs. Examples:

Conventional					
-	+	+	+	+	+
-	-	-	+	+	+
Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5

Nonconventional					
-	+	+	+	+	-
-	+	+	-	+	+
+	-	+	+	+	-
Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5

An example of a project that may have nonconventional cash flows is the case of a paper manufacturer and the deforestation that occurs as a result of their business operations. If operating in the United States, the firm will need to repair the landscape and plant new trees in the place of the trees that were removed. The process of restoring the land is likely to be very expensive, thereby causing a net cash outflow in that year, usually the last year of the project. A hypothetical set of cash flows that captures the essence of this scenario could look like this

Project A	
Year	Cash Flow
0	\$ (1,000,000)
1	\$ 750,000
2	\$ 750,000
3	\$ 750,000
4	\$ (1,260,000)

Given these project cash flows, what is the IRR? Equation 1 states that the IRR is the discount rate that forces the NPV to equal zero. However, because equation 1 is a polynomial of degree n, it will have a maximum of n solutions. In fact, an nth degree polynomial can have as many solutions as the number of cash flow sign changes, however, having multiple sign changes does not mean that you will have multiple IRRs; it simply means that you might.

Equation 1.

$$NPV = 0 = CF_0 + \frac{CF_1}{(1+IRR)} + \frac{CF_2}{(1+IRR)^2} + \frac{CF_3}{(1+IRR)^3} + \dots + \frac{CF_n}{(1+IRR)^n}$$

For our example:

$$0 = 1,000,000 + \frac{750,000}{(1+IRR)} + \frac{750,000}{(1+IRR)^2} + \frac{750,000}{(1+IRR)^3} + \dots + \frac{-1,260,000}{(1+IRR)^n}$$

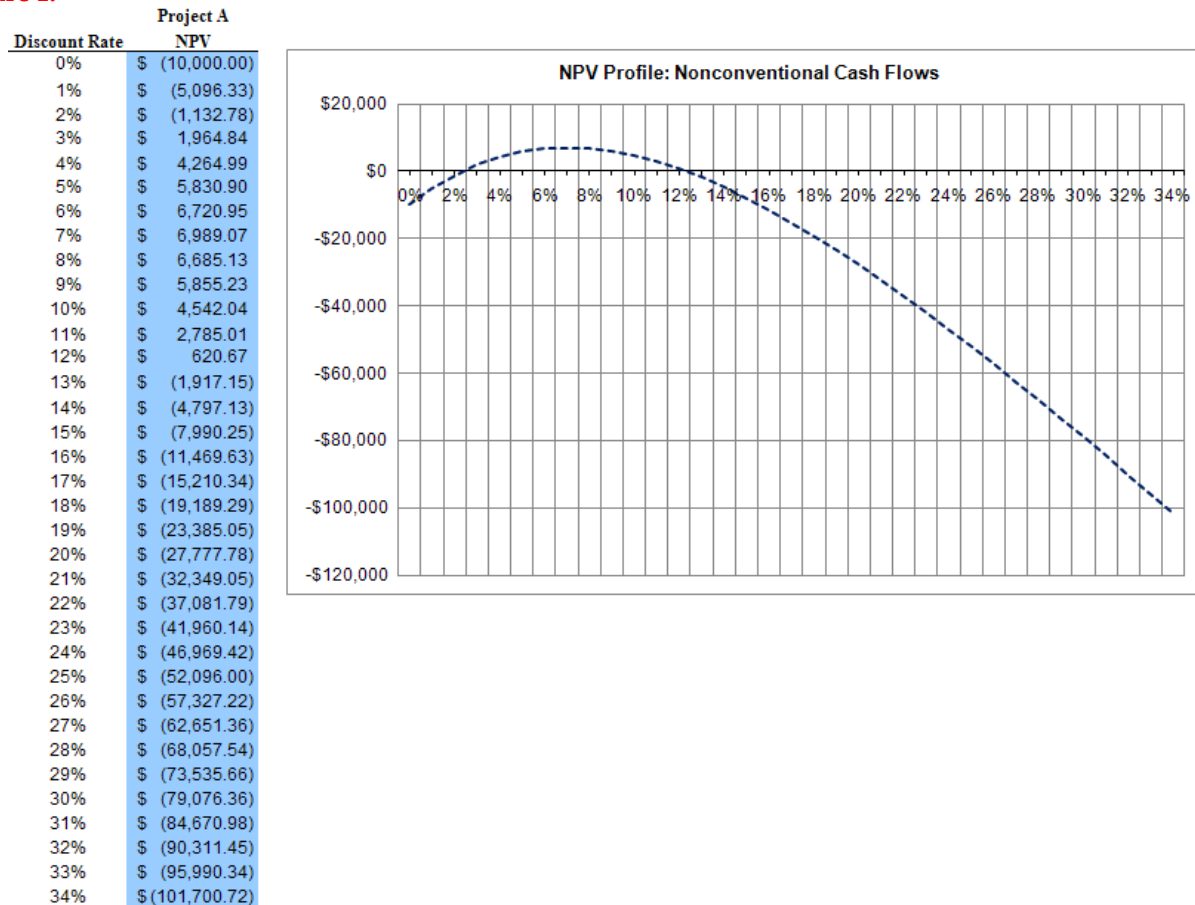
To assist in finding the IRR of this project, we calculate the NPV at various discount rates in order to create a NPV profile. We use rates beginning at 0% up to 34% in increments of 1%. Figure 1 shows the resulting NPVs as well as the NPV profile. From this we notice that the NPV is zero when the discount rate is 2.34% and again when it is 12.26%. In other words, there are two IRRs for this project. Given this scenario, which IRR should the decision maker use to decide

whether or not to invest? The answer to this question is ambiguous, which highlights one of the flaws when using the IRR to make capital budgeting decisions under the umbrella of nonconventional cash flows. In this instance, to answer the question, it is best to fall back on the NPV decision rule as its

assumption regarding reinvestment of cash flows is superior to that of IRR.

To complete the picture, we now explore a set of cash flows with multiple sign changes to see how many IRRs exist for this project.

Figure 1.



$$0 = 10,000,000 + \frac{-46,000,000}{(1 + IRR)} + \frac{+79,100,000}{(1 + IRR)^2} + \frac{-60,260,000}{(1 + IRR)^3} + \frac{+17,160,000}{(1 + IRR)^4}$$

In this pattern of cash flows, notice that there are four sign reversals. The sign reversals are from \$10,000,000 to \$(46,000,000), from \$(46,000,000) to \$79,100,000, from \$79,000,000 to \$(60,260,000), and from \$(60,260,000) to \$17,160,000. Because this cash flow pattern is a polynomial of degree four, it will have a maximum of four IRRs that will make the NPV equal zero. As we did previously, in order to close in on the IRRs, we calculate the NPV at various discount rates in order to create a NPV profile. The rates we

use for calculating the NPV begin at 0% and go to 34% in increments of 1%. Figure 6B.2 shows the resulting NPVs as well as the NPV profile. From this graph we see that the NPV is zero when the discount rate is 0%, 10%, 20%, and 30%. As the above function curves, it crosses the X axis four times with four IRR solutions. Other cash flow patterns and their resulting NPV profiles, while they may exhibit the same number of turns, may not cross the X axis as the turns occur. For these cases, fewer than n solutions will result, even for a polynomial of degree n.

For theoretical completeness, let us now consider a set of nonconventional cash flows which contain a total of four sign changes, but where the number of IRRs is less than four. More specifically, Project C is a simple modification of Project B, but includes one additional year of net cash flow totaling \$1,150 in Year 5.

Notice that the Year 5 cash flow is extremely small relative to the size of cash flows in prior years, but the impact is quite large in terms of the placement of the NPV profile. From the graph notice that the NPV profile sits above zero for most discount rates until it first falls below zero at 24.84%

and remains negative until 27.50%. Although an unlikely set of cash flows, this example is used to illustrate demonstrate

that a polynomial of degree n will have a maximum of n solutions

Project B	
Year	Cash Flow
0	\$ 10,000,000
1	\$ (46,000,000)
2	\$ 79,100,000
3	\$ (60,260,000)
4	\$ 17,160,000

Figure 2.

Project B	
Discount Rate	NPV
0%	\$ -
1%	\$ (476.55)
2%	\$ (744.99)
3%	\$ (856.41)
4%	\$ (853.44)
5%	\$ (771.28)
6%	\$ (638.74)
7%	\$ (479.02)
8%	\$ (310.48)
9%	\$ (147.28)
10%	\$ -
11%	\$ 123.91
12%	\$ 219.64
13%	\$ 284.64
14%	\$ 318.30
15%	\$ 321.61
16%	\$ 296.91
17%	\$ 247.67
18%	\$ 178.26
19%	\$ 93.80
20%	\$ -
21%	\$ (96.99)
22%	\$ (190.67)
23%	\$ (274.33)
24%	\$ (341.09)
25%	\$ (384.00)
26%	\$ (396.12)
27%	\$ (370.52)
28%	\$ (300.41)
29%	\$ (179.08)
30%	\$ -
31%	\$ 243.16
32%	\$ 556.53
33%	\$ 946.02
34%	\$ 1,417.29

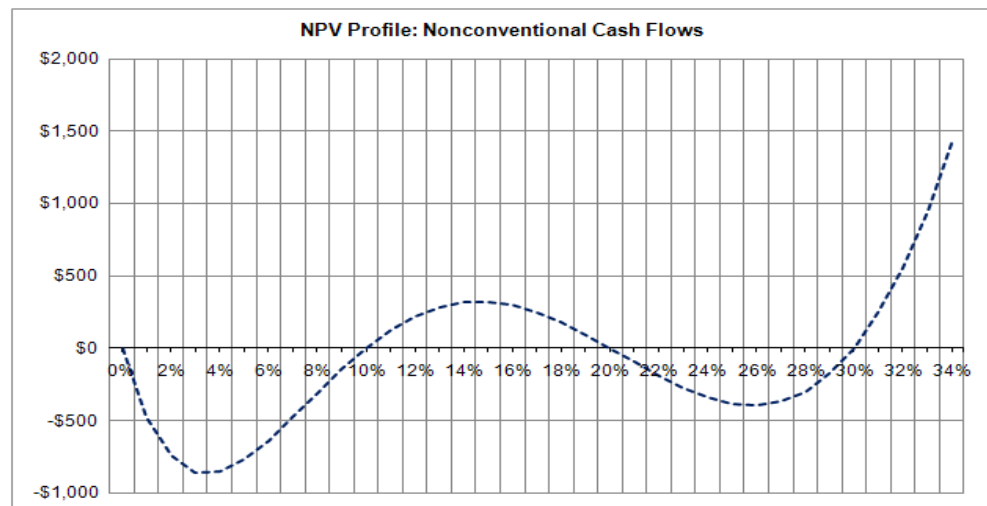
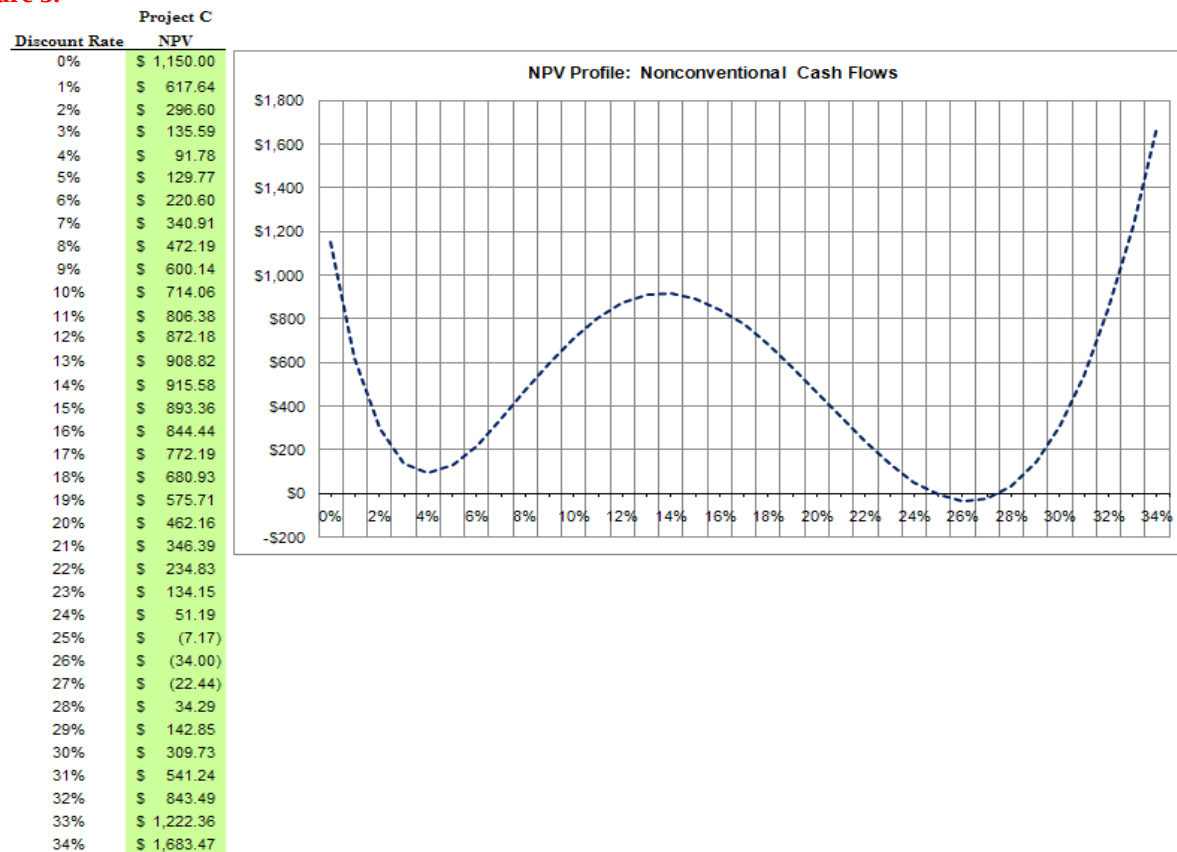


Figure 3.



Project C	
Year	Cash Flow
0	\$ 10,000,000
1	\$ (46,000,000)
2	\$ 79,100,000
3	\$ (60,260,000)
4	\$ 17,160,000
5	\$ 1,150

MULTIPLE IRRs USING *iPhone* APPS

We now present an exposition of the *TI BA II Plus* (TI) and the *HP-10B II* (HP) financial calculators to their respective *iPhone* applications¹, using the example of the multiple IRR problem in capital budgeting. Using either of the calculators (TI or HP), a problem that contains multiple IRRs becomes somewhat troublesome. In particular, if one were attempting to find the IRRs of Project A (below) using the TI calculator, difficulties arise because, by default, the TI calculator only displays the IRR closest to zero when multiple IRRs exist. Likewise, if using the HP calculator, an error message is displayed due to the fact that the HP calculator is unable to handle multiple IRR problems.

HP-10B II AND *TI BA II Plus* FINANCIAL CALCULATOR *iPhone* APPS

With regard to the TI *iPhone* application, there is very little improvement beyond what the calculator can do, at least thus far. The TI application, like the calculator, only displays the IRR closest to zero when multiple IRRs exist. The HP *iPhone* application, on the other hand, has computing power that greatly exceeds that of the corresponding calculator. More specifically, the HP *iPhone* application will display multiple IRRs, and will even graph the NPV profile, highlighting the points where the function crosses zero.

Project A	
Year	Cash Flow
0	\$ (1,000,000)
1	\$ 750,000
2	\$ 750,000
3	\$ 750,000
4	\$ (1,260,000)

The following set of screenshots show the results for computing IRR using both the TI and HP *iPhone* applications. Figure 4 is for the TI *iPhone* application, and Figure 5 for the HP *iPhone* application, making clear the difference in how comprehensively the HP *iPhone* application handles the nonconventional cash flows from Project A, relative to the TI *iPhone* application.

Figure 4. TI BA II Plus iPhone Application (Project A)

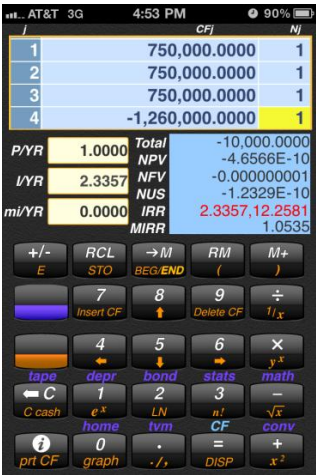
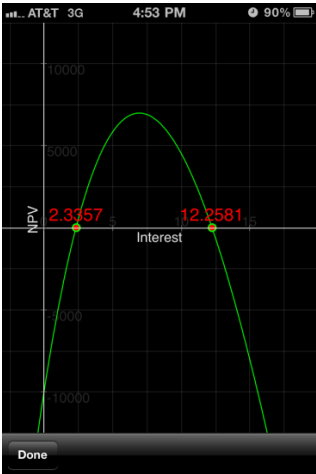


Figure 5. HP-10B II iPhone Application (Project A)



In figure 5, the first screen appears when prompting the calculator to calculate the IRR. By pressing the blue shift key and then "CF", the cash flows are displayed, showing the error and a more exact set of IRR solutions. Taking advantage of the extended capabilities of the HP emulator, by pressing the orange shift key and "graph", the NPV profile is displayed, showing the function and the two values where it crosses the axis (at a zero NPV).

Now refer to Project B, the set of cash flows with multiple sign changes. Recall from the prior example that the four IRRs for this set of cash flows are 0%, 10%, 20%, and 30%.

Project B	
Year	Cash Flow
0	\$ 10,000,000
1	\$ (46,000,000)
2	\$ 79,100,000
3	\$ (60,260,000)
4	\$ 17,160,000

As noted before, the TI *iPhone* application only displays the IRR closest to zero (Figure 6), thereby only providing the

first of four IRRs that we know to exist (0% in this case). The HP *iPhone* application also breaks down to some degree with this particular problem. As shown in Figure 7, the HP application provides two IRRs at or around 0% and two IRRs at 10% (first image). Pressing the blue shift key and "CF", the cash flows and more exact versions of the IRRs appear. Based on this example, it appears as though the HP *iPhone* application is unable to handle a problem with four solutions for IRR, providing only two of the known four solutions.

Despite the fact that the HP *iPhone* application fails to identify all possible IRR solutions, from a functional standpoint, the *HP-10B II* and *TI BA II Plus iPhone* applications do everything that their respective financial calculators do.

Figure 6. TI BA II Plus iPhone Application (Project B)

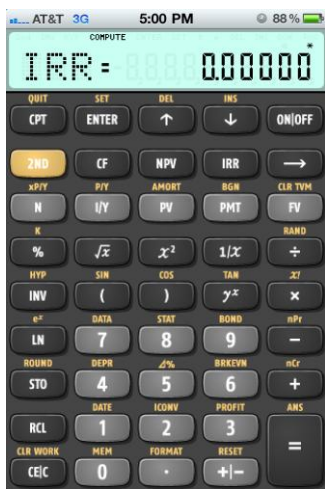
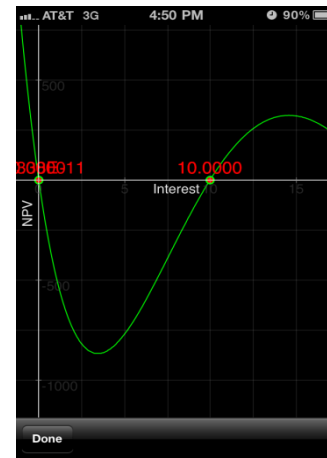
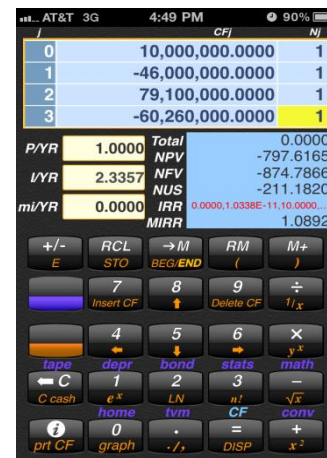
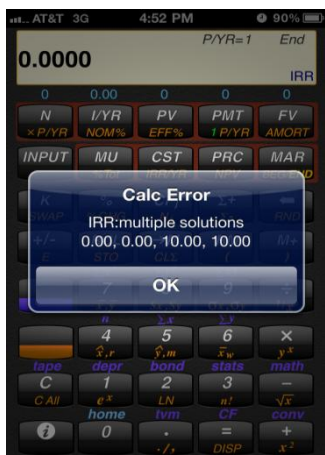


Figure 7. HP-10B II iPhone Application (Project B)



CONCLUSION

In the case of the HP-10B II, the iPhone application far exceeds the capability of the hand-held calculator, providing two IRR solutions, display capabilities concerning summaries of cash flows and solutions in a separate screen, and some fairly sophisticated graphing capabilities as well.

While the iPhone applications extend analytical capabilities, it is unlikely that professors would require iPhone and application purchases, and even less likely that communication devices would be allowable on exams. But this presentation does highlight the usefulness of the calculator applications beyond the handheld equivalents. As devices become more sophisticated, finance and business practitioners may find it convenient as well as quite robust to use handheld devices and appropriate applications to carry out useful analyses.

NOTE

1. The applications shown in this article were downloaded from the app store. The Texas Instruments emulator appears as the "BA II Plus(tm) Financial Calculator (Texas Instruments)." The Hewlett Packard emulator appears as the "10BII Calc Financial Calculator (Ernest Brock)." The latter is now available in a combination pack- iPhone and iPad versions in one, for the same price of \$5.99, called the "Hewlett Packard 10B II Calc HD". The combination version boasts HD graphics (which the iPad can take advantage of) and new worksheets with interactive graphs. The combination version was not included in our observations in this article.

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Creating a Capital Budgeting Analysis Model in Excel

Jessica Collins, Robert Irons, and Robert Weigand

The reference document for this article is available on the Journal's website, www.jfcr.org/jitf.html. The reference document is a detailed, step-by-step guide to the model described infra.

We develop an exercise that guides students through the creation of a capital budgeting analysis model using Microsoft Excel. A capital budget is a pro forma forecast of the revenues, expenses, profits and after-tax free cash flows a new corporate investment is expected to generate. The analysis typically culminates with the calculation and interpretation of project evaluation criteria such as net present value (NPV), internal rate of return (IRR), modified internal rate of return (MIRR), payback period (PB) and discounted payback period (DPB). We also provide the following resources for instructors: 1.) spreadsheet templates, 2.) a fully-functioning spreadsheet answer key, and 3.) a detailed teaching manual with step-by-step instructions that, at the instructor's discretion, may be distributed to students so the exercise can be completed as a tutorial.

The use of applied exercises that feature experiential learning and emphasize the creation of outputs that meet real-world standards are becoming increasingly important as business schools work to overcome their reputation for "...graduating students who are ill-equipped to wrangle with complex, unquantifiable issues — in other words, the stuff of management" (Bennis and O'Toole, 2005). The National Survey of Student Engagement, a joint venture of the Carnegie Foundation and the Pew Charitable Trust, identified several best practices likely to enhance student engagement in business education. Among these are an emphasis on active and collaborative learning, increased student interaction with faculty members, and other "enriching educational experiences" (Burbridge, 2005). Our exercise is designed to address these issues. It allows students to engage in an experiential learning activity that provides them with an additional perspective on key finance concepts and

calculations while developing their spreadsheet modeling skills.

OVERVIEW OF THE SPREADSHEET MODEL

In the model, students create a spreadsheet that calculates the annual after-tax cash flows and NPV, PB, DPB, IRR and MIRR for a 5 to 10-year capital investment project. The model requires students to calculate these metrics manually, rather than using the Excel functions. As part of the analysis, students are required to learn how to use Excel's Solver tool to calculate the project's IRR and MIRR. Students are also instructed to use Excel's Goal Seek and Scenario Manager tools for what-if analysis of the assigned capital budgeting problem. User-specified input data includes the initial investment, the expected first-year change in revenues, expenses and cannibalization, and the expected average annual growth rate (percentage change) of these items over the life of the project. The model permits flexibility in specifying project parameters such as project and depreciable life, choice of depreciation method, and the ability to model the change in revenues, expenses and cannibalization on a year-by-year basis.

The model is structured so that the analysis inputs, assumptions, calculations and criteria for evaluating projects are communicated to the end user in a professional and efficient manner. Students are provided with numerous tips and hints on how to add professional touches to their spreadsheets.

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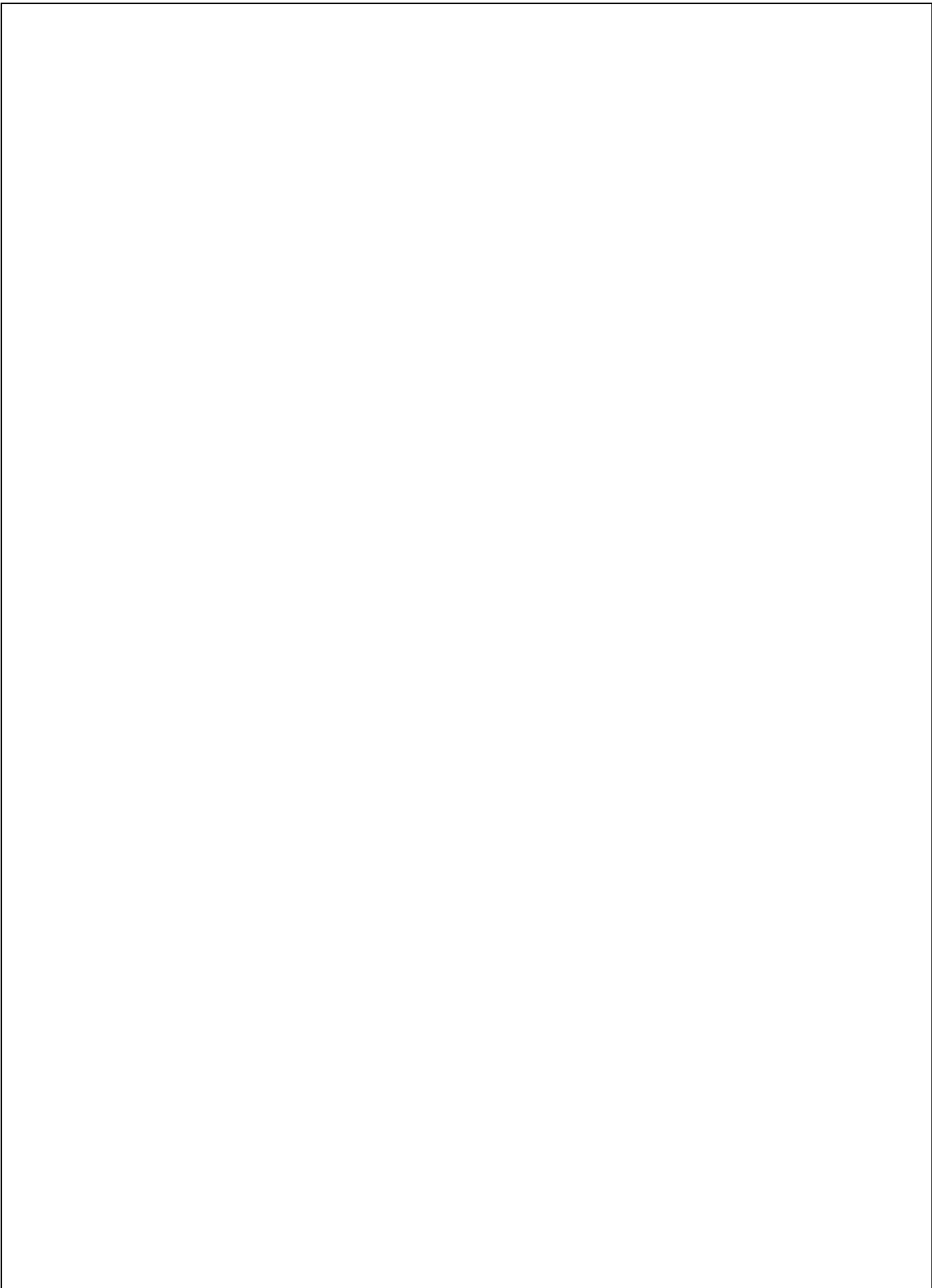
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