

flows from a capital budgeting project. The uncertainty in the net present value results from the uncertainty in the assumptions used to project the cash flows. To analyze the uncertainty in net present value it can be defined as a forecast cell for the simulation. Forecast cells usually contain formulas that refer back to the assumption cells and decision variables in the model. To create a forecast cell go to cell that contains the variable and click on the define forecast button. Be sure to name the forecast and specify the units for the forecast when defining the forecast cells. By default crystal ball selects either the value in the cell to left of the forecast or the location of the cell as the name. Naming the forecast cell appropriately lets identify which forecast value the simulation is analyzing which is especially useful if you have selected more than one forecast variable. You also have the option to set additional forecast preferences at this stage by clicking the more button in the define forecast dialog box. The forecast preferences can be set to choose the type of display, to select whether to display the forecast window while the simulation is running or when it stops and whether to fit a continuous probability distribution to the forecast.

RUNNING THE SIMULATION

Once all the cells and variables have been properly defined it is time to run the simulation. It is often useful to run the simulation a single step at a time to demonstrate what is occurring during the simulation. By clicking the single step button the simulation will run a single trial. Students can observe the assumptions changing in each trial of the simulation. Once students understand what is going on in the trials the simulation can be ran by selecting the start simulation button. Once the simulation is completed Crystal Ball ® can generate a variety of reports to aggregate the data in a convenient format. To generate a report select the create button. A variety of predefined reports are available through Crystal Ball ® or a custom report can be created to provide the specific information desired. I recommend creating the full report to provide all the data generated from running the simulation.

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Corporate Mole: A Grouping Strategy for Minimizing the Free-Rider Problem in a Managerial Finance Course

Group projects in upper level finance courses are becoming common, both for the reflection of real-world group tasks in business firms and for their appropriateness in dealing with certain types of assignments in the classroom and beyond. Professors often lament over effective formation of groups and the task of managing group dynamics, including the problem of free-riders: those students who, knowing that the group gets the grade, will shirk their respective responsibilities in accomplishing group tasks. The following article represents one evolution of grouping methods over two decades and the observations surrounding each. The most successful, in this author's experience, is a recent marriage of a so-called "reality TV" recipe with structured groupings.

This study was carried out in a typical finance capstone course. The first part of the course involves a comprehensive review of the breadth of managerial finance in the first six weeks of the course, incorporating two exams on the selected topics. This portion of the course is very rigorous, and involves traditional lectures, website instruction, exercises and assignments on the review material, and several case studies that di-

rectly enhance the topical coverage. All of the solutions are presented during class time, with the objective of preparing students for the examination. It also establishes an approach to problem solving that is direct and quick, and one that weeds out information that may not be pertinent to the issue at hand.

The remainder of the course is dedicated to groupwork with the objective of developing solutions to business problems and issues. The material for the course is provided using a variety of cases in finance. The capstone course is typically taken in the senior year of the undergraduate experience for finance majors.

The grouping methods presented here were developed at two universities. One university (University A) is somewhat unique in terms of the student population. Most are of traditional college age, and camaraderie is easily established in the typical finance graduating class of twenty-five to thirty students. In much of the required coursework, a practical and real-world approach is stressed. Through substantial interaction with corporate and workplace representatives during their business education experience, students tend to realize the importance of working in groups, communicating effectively, and being ana-

lytically savvy. The environment was also fairly consistent from year to year. The most significant change in grouping methods at University A was a change from unstructured groups to structured groups, described *infra*.

The university where the second major re-structuring occurred (University B) contains a very different student population. While most students are traditional college age, smaller portions of classes are represented by non-traditional students. Camaraderie is much more challenging to establish among students, and few students are acquainted with much of the rest of the class. Students are not generally interactive with one another, preferring to open cell phones and communicate with others who are not present than communicating with one another. It is also a larger university, adding to the impersonal environment. Classes are larger, making group projects less manageable. Interaction with corporate representatives is essentially absent, and students do not generally seem to grasp the importance of working with others, communicating effectively, and being analytically savvy prior to taking the class. The most significant change in teaching methodology at University B was the development of the current teaching strategy, "Corporate Mole."

TWO GROUPING STRATEGIES AT "UNIVERSITY A"

Non- Structured Groups

For three years running, groups were established with four to five members per group, depending on class enrollment. The group assignments did not involve any specific reasons for the combining of students. In fact, they were determined randomly, using a random number generator in Excel. The groups were formed using quintiles (or sextiles, depending on enrollment) using the random numbers. Group members, through interacting with one another, came to some decision about how the group would work together. No direction concerning how this would be accomplished was given by the professor. For every case analyzed, some form of presentation of the analysis was required, either in written communication, or by oral presentation (in front of the class and professor), or both.

No direction concerning responsibility for the presentation of the group's work was given. The group decided who would present. Students were given instruction about length requirements for the reports, and about the structure of the report and presentation. Groups were evaluated based on the report, the presentation, or both. All group members received the same grade. Students had at their disposal the same resources described for structured groups (see item 6, below).

Structured Groups

For the next two years running, groups were established with six to seven members per group. Groupings were again determined by random numbers, but using quartiles, since classes were kept smaller. Students were given the following guidance as to how the group members would interact with one another and with the professor.

1. A "Leader" was assigned randomly as the group member with the highest random number in the quartile. The class was informed in writing that the leader's task was to be the communicator for the group. The leader was responsible for asking all questions directed to the "expert" (the professor). The leader was responsible for delegating ALL responsibility for analysis

of the case and reporting of findings to other group members. The leader was prohibited from taking part in the work tasks of the group, either in analyzing or reporting. The leader's responsibility was to lead, to organize the group meetings and work schedules, and to inspire the group's motivation to complete the tasks in a correct, concise, and professional manner. The single production responsibility for the leader was to create a progress report in professional memo form, due at the beginning of each of four class periods during the time the group analysis was to be carried out. The leader would be evaluated by the six group members as to the effectiveness of the leadership. The leader would also be evaluated by the instructor for leadership effectiveness. Half of the leader's grade was group-determined and half was professor determined.

2. An "Auditor" was assigned randomly as the group member with the lowest random number in the quartile. The class was informed in writing that the auditor's task was to be the recorder for the group. The auditor was responsible for reporting the tasks assigned to each group member, the time allotted for the task, and whether or not the task was completed by the group member on time. The auditor was prohibited from taking part in the work tasks for the group, either in analyzing or reporting. The single production responsibility for the auditor was to create two copies of a report of specific activities to be distributed to the leader and to the professor at the beginning of each of the four class sessions. This created a somewhat sensitive position for the auditor, since the report could essentially contain negative feedback about group members' participation. The auditor's position was therefore made autonomous of evaluation by the group members. Instead, the auditor was evaluated strictly by the professor, and strictly on the basis of the clarity, honesty, and accuracy of the report.

3. "Analysts" were assigned randomly as the group members without the lowest or highest random numbers in the quartile. The class was informed in writing that the analyst's task was to carry out the work required for analysis of the case, preparation of a report of findings and presentation of the findings. Analysts were prohibited from involving the leader or the auditor in the working tasks. It was reiterated (for emphasis) that "the analysts do all the work," except for the leader's and auditor's reports.

4. Evaluation of students was done according to the role each one played in the assignment. Students were informed in writing that the leader would be evaluated by the other group members, and by the professor, based on their effectiveness as the leader. The auditor would be evaluated strictly by the professor, based on the accuracy, honesty, and clarity of the auditor's reports. The group members would be evaluated by the professor based on the quality of their work, and on the quality of the output produced by the group, whether in the form of a report, presentation, or both.

5. Miscellaneous information: for the structured groups, the expected output was specified for each assignment (report, presentation, or both). Instructions regarding reports and presentations included: no fancy bindings or covers - just stapled in the upper left corner, the report or presentation should be neat and well-organized, reports should be typed in laser or sharp inkjet output, the report or presentation should appear profes-

sional, the report or presentation should contain no irrelevant content (no 'bull' or 'fluff'), there was no length requirement - it was the leader's responsibility to determine what due diligence was required and what 'adequate' was, no visual aids in either a report or a presentation unless they contributed significantly to the analysis, and the report had to be segmented and organized.

6. Resources: All students had a detailed guide to analysis, reporting, and presentation of case reports. The sections of the guide included an introduction to the case method and the philosophy of cases, organization of thought concerning cases, strategic concerns for the enterprise and its environment, financial analysis (including analysis of leverage, capital budgeting and other quantitative methods), financial concepts (including business structure, agency, market characteristics, etc), analytical process, reporting guide, and a large guide to sources of outside information. Additionally, most of the students still had textbooks and other resources from prior business courses, or purchased a financial management textbook at the intermediate level.

Initial Reactions to Non-Structured and Structured Groups

It is interesting to observe students' reactions to each of the group regimes. The non-structured regime creates a flurry of questions regarding guidance as to how the system will work. Questions tend to lean toward how to proceed with the analysis, who leads the group, and how a leader is chosen. Students usually select a leader, and it is usually by suggestion by more than one person. Sometimes, the leader will simply take charge, collecting contact information and setting meeting times and places. Often, the person a group chooses as their leader is less than enthused about being the leader. Unless most of the group is in favor of the selected leader, problems usually crop up as a result of unwilling followers. Leadership within a group seems to be of tremendous importance to the effectiveness with which a group operates. In the unstructured approach, the authority of the leader is at the whim of the group.

Leadership in the structured approach is obviously very different. Students seem to appreciate the randomness of selection of the leader. The authority commanded by the leader comes from a higher authority, the professor. Also, in the structured approach, group members realize that the leader answers both to them and to the professor, both of whom are constantly assessing the effectiveness by which they lead. If the structure of the groups is explained prior to revealing the selections, there is usually a high degree of anticipation about who will be in what group, and who the leader and auditor will be. This generally presents a good opportunity to give students some insight about committee tasks and decisions that occur in the business world. The group leader is usually someone in higher authority within the firm, and tasks are usually delegated to the different committee members.

Reactions Over Time

Student suggestions for structure run rampant in the unstructured regime. Several times, suggestions that students be allowed to determine their own groups pop up. It is reminiscent of the 'buddy' system, where two or three persons will seek to be in the same group. Some have even suggested the equivalent of the 'playground' solution; select four people to choose sides. In the unstructured group, the personal preferences involved in the formation of groups has generally been despised, and it is

commonplace for the professor to come up with remedies for problems that crop up. Other times a group just seems to 'mesh', completing tasks seemingly without mishap. Still other observations indicate that only one or two group members actually did any work on the tasks. Unfortunately, in these situations, the group grade is recorded for all group members.

The structured approach seems to solve some of these issues. There still appears to be some initial wariness about the randomness of the groupings and selection of leader and auditor, but it has been short lived during the observed semesters.

A very interesting result is that the auditor position becomes a coveted prize. This is partially because of the autonomy, but an even more likely attraction is the evaluation of the auditor solely by the professor. The task for the auditor is also very clear-cut, and not dependent on the actions or attitudes of any other group member. In the three semesters observed, it has been a fairly easy task to detect auditor fraud. Auditors unwilling to report truthfully receive a severe markdown. In both semesters, this has been a good opportunity to cover the importance of an auditor's words. The auditor is in a unique position that requires recording of fact. It has been pointed out to us by other professors that the auditor's position may be coveted because students can easily earn full credit by being accurate and on-time.

The leader position is a different story. It becomes very apparent that leadership is a crucial element to the success of the group. In the observed semesters, students either personally dread the prospect of being selected as leader, or they personally covet the position. Their attitude toward the position is based on their experiences from the past in dealing with being in a leadership position. Perhaps surprisingly, though, the randomness of selection still appears to be appreciated by both selected leaders and by their group members. On several occasions, students who would never have volunteered for a leader position rose to the occasion and actually gained some leadership confidence.

Another element of the structured approach that seems to be prevalent is the enhanced rivalry between groups. After observing this result in the first semester of structured groups, an experiment on the final group project was attempted. The four groups would compete for letter grades, involving a simple ranking of the report and presentation of their last projects. The highest ranking group received an 'A', the second highest ranked a 'B', etc, down to a 'D'. The rivalry and effort that went into that week of groupwork was unprecedented. In fact, three of the four projects were truly excellent, in the 'A' range, and the other group handed in a 'B+' effort. The projects were so good that the grading was softened, with grades ranging from 'A' to 'B-'. Assigning a 'D' would not have been very appropriate.

Another noteworthy result is the development of leadership. Under the structured regime, the leader had a great incentive to promote cooperation (among the other group members), quality work, and team play. In most of the groups and during most of the projects, the leaders developed remedies for problems that cropped up. Toward the end of the course, absenteeism became virtually nonexistent, and very few assignments were bungled. There were few cases of observed lack of effort. In several cases, students who did not seek to become leaders found that they had a great ability to lead.

Feedback from the Corporate World

The communication received from former students who have chosen to contribute feedback has been exceptionally positive. Comments have indicated that the course prepared some students for what they would face in the real world. In many of the corporate environments that these students enter after graduation, teamwork is a vital element to the way the company operates. In most of the situations described, rarely does an individual get to pick their own team; rather they are thrown together with people they are unfamiliar with and must perform together in the common cause. Most of the feedback indicates that leadership within the corporate environment is based on responsibility and position, rather than on leadership capability. One of the most rewarding comments is that the methodology created memories of the one course that was most influential in their preparation for the business world.

**THE DEVELOPMENT OF THE
"CORPORATE MOLE" STRATEGY AT
"UNIVERSITY B"**

At University B, some refinement of the grouping strategy was necessary to overcome the lack of camaraderie among students, less interaction between students, a population that grew up in the information age, and less exposure to professional managers during their undergraduate experience. An astute former student came up with a great suggestion: "You ought to make the auditor a mole!"¹ The suggestion seemed to have merit, considering the enthusiasm with which our current students pursue the episodes of reality TV. A new grouping regime was launched in 2009, with the following changes to the former structured groupings.

The former "auditor" role was reworked as the "corporate mole." A quick survey of former students currently working in corporations, financial institutions, and financial regulators confirmed the existence of informal information channels reaching to top management that were indeed secretive and to a large extent shrouded from general knowledge. These channels kept upper managers informed beyond formal hierarchical communication, and maintained some level of paranoia among lower level task groups. Even though the trial might prove risky in a class setting, it was decided to implement the strategy in 2009. Some colorful graphics emulating the TV reality shows were accompanied with the following role descriptions.

Group Descriptions and Group Dynamics

For casework in the last half of the semester, we will determine groups using random number generation in excel. In each group, group members will have a designated role according to randomly generated numbers as follows:

1. A "Leader" is assigned randomly as the group member with the highest random number in the grouping. The leader's task is to be the communicator for the group. The leader is responsible for asking all questions directed to the "expert" (the professor). The leader is responsible for delegating ALL responsibility for analysis of the case and reporting of findings to other group members. The leader is discouraged from taking part in the actual work tasks of the group, either in analyzing or reporting. The leader's responsibility is to lead, to organize the group

meetings and work schedules, and to inspire the group's motivation to complete the tasks in a correct, concise, and professional manner. The single production responsibility for the leader is to create a progress report in professional memo form, due at the end of each day during the time the group analysis is to be carried out. The leader will be evaluated by 1) the group members as to effectiveness of leadership and 2) by the instructor for leadership effectiveness evidenced by observation and by the quality of the progress report memos (50% weight for each evaluation).

2. A corporate "mole" is assigned randomly as the group member with the lowest random number in the grouping. The mole's task is to be the secret informant, reporting daily to the professor concerning the group's activities, whether everyone in the group is participating, being cooperative, and contributing to the success of the case analysis, and whether the leader is leading effectively. This is a somewhat sensitive position for the mole, since the reports could essentially contain negative feedback about group members' participation. The mole's position is therefore not known to others in the group, and the mole is free from evaluation by the group members. Instead, the mole is evaluated strictly by the professor, and strictly on the basis of the clarity, honesty, and accuracy of their reports. The designation of mole, of course, implies that their identity is totally secret. If the group members figure out who the mole is, then the mole's grade on the project will be negatively affected. The mole should participate fully in the analysis of the case, so as not to raise suspicions. In the corporate world, moles are commonplace; informal relationships provide information flows directly to top management. All group members should assume that their actions are being monitored at all times and that the identity of the mole will be secret until the end of each project. If the mole still desires to remain anonymous at that time, the professor will honor the request, of course.

3. "Analysts" are assigned randomly as the group members without the lowest or highest random numbers in the grouping. The analyst's task is to carry out the work required for analysis of the case, preparation of a report of findings and presentation of the findings. Since the mole is among the analysts, and acting as such, the mole participates in the analysis of the case.

After the determination of groupings, an email was sent to each of the secret "moles" with a large image of a fat mole digging out of a burrow with the caption "YOU ARE THE MOLE!"

Initial Reactions to the Corporate Mole Strategy

Students responded very positively after receiving the 'reality' materials outlining the grouping strategy and the thought of a "mole" reporting their every move. Less motivated students were wary of being perceived as a free-rider, and generally participated to a larger degree than they may have in absence of a secret informant. Leaders in the first group assignments reported greater participation and interaction among group members than in the prior structured group regime. In the first iteration of group projects, the moles in every group chose

to reveal themselves publicly in class at the end of the project. The class response was enthusiastic, with a buzz about “I knew you were the mole” or “I want to be the mole.”

In the second iteration of assignments, only three of seven group moles revealed themselves in class at the end of the projects. In the second iteration, there were four obvious free riders identified within the groups with the unrevealed moles. The offending students were almost chastised in the mole reports, and by three of the four group leaders in the affected groups. The lack of moles coming forward publicly created an even more intense buzz about the identity of the moles, and why they were not revealing themselves.

In the two iterations of projects following, the free-ridership was virtually eliminated except in two cases (repeat offenders). Their identification was reinforced by their different groups and their evaluation reflected their lack of contribution in the groups. For most other free riders, a single warning was enough to motivate them to change their ways.

Moles, in general, were very good at reporting detailed activities of the group and identifying free rider problems. In only one case, the mole was likely friends with the free rider, but in the leader’s reports and the group’s evaluation of one another, the free rider was identified in an obvious way. The incident was discussed in class, without identifying the people involved, which seemed to take care of any future repetition of the problem. It also indicated to the mole in question that they had been found out, and no question was ever raised by them concerning their grade, which reflected the lack of reporting the free rider.

Overall, student enthusiasm for the course and for the group study and case content was much greater when the “mole” was introduced into the mix. The link to reality TV popularity probably helped as much as anything, and the heightened interest in the course resulted in generally higher quality work and possible alleviation of the free rider problem.

Conclusion

This particular study is, of course, anecdotal, with little likelihood of any scientific conclusions. The results observed and presented, however, reveal a pattern of behaviors under each of the group strategies. As educators, professors often seek new ways of approaching particular courses, and solutions to some of the problems associated with non-traditional teaching methods.

The feedback from both students taking the course and completing the course, and from professional managers with whom the strategy was shared, has been positive. It would be interesting to see how others might employ the technique, and even refine it further to fit their own students’ learning rubric.

1. I would like to give credit to Jeremy Martin, who initially suggested the corporate mole strategy to me in January 2009.

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A Primer on Financial Calculators

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Like it or not, business calculators have become a necessity of every day life for our students. This paper is not meant to condone or condemn the practice of employing calculators to teach a subject (or topic area), but to aid both the teacher and the student in the function and use of financial calculators. The objective of this paper is to test the most popular financial calculators for basic problem solving, accuracy and ease of use. We also present elementary primers to the basic usage of each of the calculators discussed. The primers represent an easy to understand, step by step instruction which could make teaching easier for the instructor and learning easier for the student.

Many business classes use financial calculators as a teaching tool. As a result, faculty members are frequently required to spend classroom time instructing students on the use of their calculators as a prerequisite to employing the calculators for analysis and decision making. Instruction in the use of calculators may be a more formidable task than expected. The enormity of the task is better understood when the number of calculator manufacturers, the number of models and the complexity of operation is taken into consideration. One also has to keep in mind that most calculators require different key strokes to solve identical problems.

Covering calculator functions in class may take time away from other teaching objectives. In order to save time, some professors insist their students become self-taught in the usage of their instrument. Other instructors will state that their students only purchase a specific calculator if they expect to obtain aid in its use from that instructor. As business calculators have become more powerful and more complicated, the learning curve for their usage has increased. This paper compares the use of the most popular financial calculators and includes a one page primer for each calculator model tested. The one page primer can be duplicated and given to students to accelerate their learning curve and increase their understanding.

The authors recognize that most employers require students to have a rudimentary knowledge of calculator usage and that the use of tables to calculate items such as the time value of money may be a thing of the past. Many of the textbooks in finance no longer have financial tables (although all of the textbooks that the authors examined have simplified calculator instruction). The authors of this paper also hold no position on the use of financial calculators in the classroom. This paper is designed to help faculty move more quickly out of calculator functions into more meaningful discussions, and to help students solve basic financial problems using calculators. The one page primers in the appendices of this paper (available at www.jfcr.org) may be printed and distributed by the professor to assist students in understanding the use of their calculators.