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INSTRUCTORS' NOTES

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LETTER FROM THE EDITORS

Welcome to the *Journal of the International Academy for Case Studies*. The editorial content of this journal is under the control of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world. The purpose of the *JIACS* is to encourage the development and use of cases and the case method of teaching throughout higher education. Its editorial mission is to publish cases in a wide variety of disciplines which are of educational, pedagogic, and practical value to educators.

The cases contained in this volume have been double blind refereed, and each was required to have a complete teaching note before consideration. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies. The Instructor's Notes are published in this volume and the corresponding cases are published in a separate issue of the *JIACS*.

We intend to foster a supportive, mentoring effort on the part of the referees which will result in encouraging and supporting writers. We welcome different viewpoints because in differences we find learning; in differences we develop understanding; in differences we gain knowledge and in differences we develop the discipline into a more comprehensive, less esoteric, and dynamic metier.

The Editorial Policy, background and history of the organization, and calls for conferences are published on our web site. In addition, we keep the web site updated with the latest activities of the organization. Please visit our site and know that we welcome hearing from you at any time.

Inge Nickerson, Barry University Charles Rarick, Purdue University, Calumet NOTES

GONE WITH THE WIND: HOME DEPOT IN FLORIDA

Kuo-Ting Hung, Suffolk University Neil Hunt, Suffolk University Hasan Arslan, Suffolk University

CASE DESCRIPTION

This is a field/secondary researched case that describes multiple operational issues that are faced by Home Depot store managers located in areas that have a high probability of encountering hurricane activity. The problem for the character in the case revolves around how a large retail operation can manage its inventory levels and logistic concerns while maintaining the desired service level. The surge of sales before a hurricane makes landfall helps to increase store revenues. To prevent stock out, stores need to quickly raise the inventory level of popular items; however, items not sold during the rush before the hurricane makes landfall may have to stay in the store until the next hurricane. Worse, these items may have to be shipped to other stores faced with incoming hurricanes in other geographical areas. Such additional transportation increases cost per unit item, thus reducing profits. Therein lies the potential conflict of interest between the local store manager and the regional distribution center management team.

CASE SYNOPSIS

This case focuses on the pre-hurricane planning analysis of a home material supply company located in a hurricane prone area. In the age of information, as weather information becomes readily available, stakeholders are increasingly less forgiving of mismanagement of weather risk. The conflicting goals of maintaining service quality while maintaining low cost operation is a common challenge faced by many retail industries. In this case, students are exposed to the complexity of inventory management during hurricane season at the retailers and the Home Depot distribution center. The case includes a simulation exercise with role playing as an alternative to standard in-class case analysis because of the engaging nature of the exercise. The information used in this simulation, such as strength, path, and landfall locations of each hurricane, is based on actual data from National Hurricane Center and NASA.

INSTRUCTORS' NOTES

Intended Audience and Course Placement

This case is created primarily for upper division undergraduate students taking an operations management course. The case is designed to be taught in one to two class periods depending upon instructor approach employed. A key feature of this teaching note is the simulation exercise included with this case to allow students to experience the complexity of inventory management under an impending natural disaster.

Alternatively, this case can be used as a scenario for discussion on inventory management. The students are expected to spend between 2 to 3 hours of outside preparation time, depending upon instructor's choice of class preparation method.

The case should be introduced after the students have read the relevant chapters on inventory and logistics management (Chapter 10, Inventory Management, Foundations of Operations Management, by Ritzman and Krajewski, 2002; Chapter 12, Independent Demand Inventory Management, Operations Management, by Reid and Sanders, 2004). An instructor may use this case to begin discussion in inventory planning and service quality or use this case for an end-of-chapter discussion in inventory management.

Learning Objectives

The overall purpose of this case is to introduce students to conflicting considerations in decision making within retail operation management, including the tradeoff between costs in transportation and inventory holding, the conflict between operational cost control and service quality maintenance, and the balance between aggregated planning and satisfying immediate local need.

In this case, students consider the difficult tactical operation decisions faced by managers in real world, seasonal inventory items decision making while addressing the uncertainty of a natural disaster.

Specific learning objectives are as follows:

- 1. Students will be able to identify factors influencing inventory management decisions.
- 2. Students will be able to understand and appreciate the difficulties in making decisions under insufficient information and uncertainty.
- 3. Students will be able to recognize the challenges in coordinating conflicting local needs at the regional level.
- 4. Students will be able to apply logistics tools used for managing the supply chain upon occurrence of natural disasters such as hurricanes.

CASE PREPARATION

There are several approaches in preparing the students to analyze this case. It is strongly recommended that students have some understanding of Home Depot's business and target customers. The instructor could assign that the student review the Home Depot website, corporate news link to help familiarize them with the goals/objectives of Home Depot (www.homedepot.com).

Students should have exposure to the factors influencing inventory management decision such as the role of inventories in supply chain and costs associated with inventory decisions. Reading assignments before class, e.g. Chapter 10, Inventory Management, *Foundations of Operations Management*, will help students in their analysis of the case.

TEACHING SUGGESTION

We provide a role playing simulation game to highlight the decision-making procedures demanded by inventory maintenance in an unsettled and dynamic environment. The information used in this simulation, such as strength, path, and landfall locations of each hurricane, is based on actual data from the National Hurricane Center and NASA. To prepare for the simulation exercise, students should be given the Appendix A of this instructor's note prior to class to learn about the uncertainty of nature and the destructive force of hurricanes.

We also provide introductory level questions on inventory management which the instructor can use to build a general understanding of the subject prior to conducting the simulation exercise in class. When time permits, the instructor may devote one class period to cover fundamental inventory management concepts (40 minutes) with discussion based on the case questions (40 minutes). During the second class period, instructor can use the simulation exercise to illustrate the complexity of inventory management in practice. The simulation exercise should last about 40 minutes. The remaining time of the second class period should be used for debriefing. Detailed information about the simulation is included at the end of this teaching note.

CASE QUESTIONS

- 1. Ignoring the issue of hurricanes for now, why would local stores try to keep low inventory levels? Why might each store want to keep high inventory levels?
- 2. What are the types of inventories, according to the reasons they are kept? In this case, why would a Home Depot store keep more inventories during hurricane season?
- 3. How can you improve Home Depot's inventory management during the hurricane season? What are the potential conflicting considerations between operational cost control and service quality management in this case? How should these considerations be balanced?
- 4. What are the potential conflicting considerations between the regional manager and the local store manager? How do you reconcile the conflicting objectives of the local and regional managers?

The students need to understand the conflicting factors influencing inventory and logistical decisions, as well as the complexity of managing a distribution network for a national store that carries a huge collection of SKU's, such as Home Depot. There are also opportunities to further discuss corporate policy, supply chain management and distribution strategies for both the regional manager and corporate home office.

Several factors complicate the decisions that may be discussed after students are familiar with basic concepts of inventory management. Students can be instructed to discuss these issues and identify additional information necessary to analysis these factors.

- 1. Should Home Depot use the impending surge of sales as a profit generating opportunity? Why or why not?
- 2. What are the long term service ramifications to selected stock out of hurricane related items in a hurricane-prone region during the season?

- 3. Given that hurricanes are seasonal ("Frequently Asked Question", 2005), i.e., the period is traditionally June 30-November 30, which tactic would be more cost effective: to hold an overstock of items during the beginning of the season and replenish on an as-need basis depending on the inventory movement and hurricane activity?
- 4. Is there a conflict between large transportation costs of post hurricane items from "out of region stores" to the impacted area as compared to community goodwill and customer retention?

RESEARCH METHOD

Derived both from field interviews with Home Depot management and articles in journals and the press, this case presents a management dilemma that was faced by a local store manager of Home Depot operating in the Lee County Florida area. Our onsite observations and initial literature reviews of Home Depot (Morse, 2004a, 2004b) and its competitors convinced us that managers at these stores face significant operational challenges with respect to customer behavior associated with hurricane landfalls. In 2005, we interviewed Don Harrison, Home Depot Public Relations representative, to identify Home Depot's operational strategy in Florida during the hurricane season. Specifically, we learned about Home Depot's practices in inventory management, distribution, and shelving, before and after hurricane landfalls. At the same time, we gathered statistical information related to past hurricane paths, landfall locations, frequency, and power, based on our literature research of information from National Hurricane Center (NHC) and National Aeronautics and Space Administration (NASA). We also researched several press articles released during the 2004 and 2005 hurricane seasons to understand the disruptive power of hurricanes and consumer behavior during the hurricane seasons.

Past consumer behaviors show that customers rush to buy emergency and necessity items such as plywood and batteries just before and after a hurricane makes landfall (Infortunio, 2006). In order to maintain a certain service level, more inventories are needed to satisfy such short lived demand ("Keeping Stores Stocked in Natural Disasters", 2005). The potential additional transportation cost per item can drive down profit; yet over-ordering may result in increased holding costs as well as stagnant inventory buildup. Furthermore, since it takes time to deliver from the vendor's distribution center to local stores, there is very little time to place order after a hurricane is forecasted to make landfall (Hudson, 2004). In the case of Lee County, Florida, the transportation lead time alone averages at around 8 hours. Besides, it can be dangerous to drivers should a hurricane make landfall while a shipment is on-route.

Forecasting the actual path of a hurricane is difficult, even within a 24 hour period. This often means it is uncertain where the hurricane will make landfall and when local government will invoke voluntary and/or mandatory evacuations all which impact decision making.

Thus Home Depot store managers, operating within different Florida counties, may all request additional inventory "just in case." This creates complications for regional managers who are working with vendor's distribution centers to coordinate deliveries to various local stores.

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ANALYSIS

Frequent, yet unexpected, events can often introduce complexity in operation managements at all levels of a supply chain (Zsidisin, Ragatz, & Melnyk, 2003). This case uses hurricanes as an example to illustrate the complexity of inventory management.

In the age of information, as weather information becomes readily available, shareholders are increasingly less forgiving of mismanagement of weather risk (Reda, 2004). The seemingly conflicting goals of maintaining service quality while maintaining low cost operation is a common challenge and raises questions from students who are studying operations management.

For a large retail supply chain such as that of Home Depot, with nearly 140 locations in Florida, coordinating the operations over all stores is not a trivial task (Appendix B). In this case, we use Home Depot operating within Lee County, Florida. The threat of a hurricane brings out the complexity in inventory and logistics management under uncertainty. Home Depot can simply ignore the potential demands. However, this is deemed inappropriate because of the fierce regional competition with other local stores such as Lowe's. Through the use of the simulation exercise included with this case, students can experience the complexity of managing inventory faced by the retailers and the Home Depot distribution center through hurricane seasons.

CASE QUESTIONS AND ANSWERS

1. Ignoring the issue of hurricanes for now, why would local stores try to keep low inventory levels? Why might each store want to keep high inventory levels?

Inventory management is an important aspect in many industries, including retailing such as Home Depot. Though the availability of items is a key competitive advantage for Home Depot, there are many costs associated with keeping inventory. For example, inventory must be counted, paid for, and managed. Also, investments in inventory mean opportunity cost.

Several factors influence inventory holding policies in business. On one hand, inventory holding cost, i.e. the cost of keeping items in stock, provides a motive for firms to keep small inventories. Inventory holding cost includes opportunity cost, storage and handling due to warehouse facilities and labor, taxes and insurance. Certain items may also have shrinkage cost (fresh produce), obsolescence (fashion, electronics), and deterioration (batteries).

On the other hand, there are many reasons, such as service level, ordering cost, and transportation cost, for firms to keep large inventories. In retail industries such as Home Depot, having a high service level means reduced stockouts, i.e. when item is not on hand when demand occurs, and backorders, i.e. customer order is not filled when promised or demanded but is filled later. Ordering costs include follow-up, receiving, and paperwork, associated with purchasing. Transportation cost is the cost of transporting items from one location to another. Since the setup cost of transportation is usually much larger relative to an individual item's value, items are often packed and shipped in full truckloads to reduce the unit cost of transportation. In some manufacturing and food industries, firms may build up high levels of raw material inventories, such

iron ore and corn, to hedge against future price increases and provide a means to obtain quantity discounts (Ritzman & Krajewski, 2002, pp. 324-325).

A B student should be able to identify most of these factors, including inventory holding cost (opportunity cost, storage cost, tax, and insurance), service level, ordering cost, and transportation cost. An A student may be able to list shrinkage cost, obsolescence cost, deterioration cost, and benefit of hedging against future price increase.

2. What are the types of inventories, according to the reasons they are kept? In this case, why would a Home Depot store keep more inventories during hurricane season?

In general, we can group inventory into four types, cycle inventory, pipeline inventory, safety stocks, and anticipation inventory, based on the reasons of holding these inventories (Ritzman & Krajewski, 2002, pp. 328-329). Students may provide different ways to categorize different types of inventory. For example, students may suggest keeping inventory as way to buffer against uncertainty of demand (anticipation inventory), seasonal increase in demand (anticipation inventory), supply chain interruption or supplier failure (safety stock inventory), etc. Students with manufacturing backgrounds may suggest inventory as a result of work-in-process (cycle inventory), or transportation lead time (cycle or pipeline inventory).

Cycle inventory is created due to ordering larger quantities so as to place orders less frequently, so the longer the ordering cycle the bigger the ordering quantity (Q). Large ordering quantity can help lowering costs including ordering cost, setup cost, transportation cost, and purchasing cost. The amount of average cycle inventory can be computed as Q/2. So, larger ordering quantity increases inventory holding cost. Cycle inventory is also created when one produces in large batches. In this case, this is also known as work-in-process inventory.

Safety stock inventory is kept to protect the firms against uncertainties such as demand uncertainty, delivery lead time uncertainty, and supplier reliability uncertainty. It can be created by placing an order sooner than they are needed. So, the replenishment order will most likely arrive ahead of time, thus protecting the firm against uncertainties. Retailing firms often keep a certain level of safety stock in order to provide high level of customer service.

Anticipation inventory is created to absorb uneven demand and supply. Essentially, firms create anticipation inventory by stockpiling during the slack season before a price increase or an anticipated surge of demand. For example, makers of heaters will manufactures heaters during the summer months and store them in warehouse in preparation for the heighten winter demand for heaters.

Pipeline inventory are inventory in transit after an order is placed but not yet received. On average, pipeline inventory quantity is equal to the (demand quantity per period)*(delivery periods).

For the purpose of this case, stores such Home Depot will either be keeping safety stocks or anticipation inventory before and during the hurricane season. When demand surges in Florida during the hurricane season, there may also be a substantial amount of pipeline inventory between distribution center and stores due to increased store orders.

An average student should be able to identify anticipation inventory and safety stock inventory. An A student may be able to also identify cycle inventory and pipeline inventory, and the

reason they are created. Typically, an average student will be able to associate anticipation inventory or safety stock inventory with extra inventory holding during hurricane seasons. An A students may be able to include increased pipeline inventory as part of the answer.

3. How can you improve Home Depot's inventory management during the hurricane season? What are the potential conflicting considerations between operational cost control and service quality management in this case? How should these considerations be balanced?

Improving the management of Home Depot's inventory during hurricane season will require thorough analysis of its stores' inventories and their inventory policy.

Rather than closely managing all inventory items, only a small percentage of items held in inventory deserve management's closest attention. The demand for items most affected by the impending hurricane should be identified. These items are then subjected to the ABC analysis (based on the Pareto Principle). Divide the inventory items into three classes, based on having greatest demand during the hurricane rush and/or highest profit margin. Class A items should be monitored closely (Ritzman & Krajewski, 2002, pp. 330). For Home Depot during the hurricane seasons, plywood panels and batteries will fall in this category.

Good inventory policy on class A items will have a greater impact on the store's performance than items on the lower classes. A certain level of safety stock for class A items should be established to cater to increased demand during hurricane rush.

When there are uncertainties in demand, there is a need for safety stock. From a management perspective, the quantity of safety stock depends on two factors: service level and degree of demand uncertainty.

Here, we discuss how to derive such safety stock level under demand uncertainty. First we need to decide on a service level appropriate for the Home Depot stores. In order to make such a decision, we must weigh the benefits of holding safety stock against the cost of holding it. We must also consider the variability in demand during lead time measured by probability distributions. This is the basis of balancing operational cost and service quality (Ritzman & Krajewski, 2002, pp. 339-341).

Assuming that the demand has a normal probability distribution and the average demand during lead time is the mean of the distribution, then the safety stock can be computed as safety stock $= z^*(\text{standard deviation of demand during lead time})$. Z is the number of standard deviations from the mean to implement desired cycle service level. If the delivery lead time is long, then it will be necessary to take into account the amount of demand generated during delivery lead time. In general, larger value of z improves the fill rate and reduces the probability of stock out. Consequently, service quality is improved. This approach is robust in assessing the balance between service quality and inventory requirement. For example, one can extend this approach for high price items, such as generators, by modeling demand as Poisson distribution.

A C student should be able to point out that higher inventory level will lead to higher service level, or that higher inventory level will lead to greater cost. A B student will be able to identify these and apply the ABC analysis on inventory to identify the items that require more focus. An A student should be able to also associate the quantitative method of safety stock calculation with service level requirement.

Some students may suggest the application of Economic Order Quantity to improve Home Depot's inventory management. This is, however, inappropriate for the hurricane related items, due to the seasonality the demand and high level of demand uncertainty.

4. What are the potential conflicting considerations between the regional manager and the local store manager? How do you reconcile the conflicting objectives of the local and regional managers?

The Home Depot managers may have different goals. From the regional manager's perspective, the goal may be to run an efficient supply operation for the organization as a whole. However, from the local store managers' perspective, their goal is probably to run a responsive operation to meet the demand of the local public.

In an efficient supply chain, the main purpose is to minimize inventories and maximize efficiency of the members of the supply chain (Ritzman & Krajewski, 2002, pp. 276-278). From the regional manager's perspective, the overall demand of the region is must less variable due to risk pooling. This allows the regional manager to run an efficient supply operation with low safety inventory level.

However, the local store managers face a different reality. In order to run a responsive operation, the stores must react quickly to market demands. The focus is on reaction time, and the primary competitive priorities are fast delivery times and volume flexibility. The different realities faced by these managers could potentially create a conflict between the regional manager and the local managers.

Typical answers from students may focus around organizational issues, such as misalignment of incentives and lack of communication. An A student should be able to realize that the risk pooling effect will create different realities for the regional and local managers. This should be the focus of the discussion.

SIMULATION EXERCISE

Introducing Students to Hurricanes

This simulation exercise will take about 45 minutes to an hour. About 10 to 30 students (divided in five groups) can do this simulation together. Interested instructors should contact the author for the electronic file of the simulation slides (Appendix C).

During the introduction, students will learn about hurricanes, including the category ranking of hurricanes and their destructive power. This information is covered in slides 1 through 16 (Please refer to Appendix C of this note). To save valuable class time, the instructor should also ask students to read Appendix A of this instructor's note prior to class.

Game Rules Overview

Divide the students into five groups. One of the groups will represent the Distribution Center; the other groups will represent the local store managers from the different regions of Florida (See Appendix B in this instructor's note for Florida store locations).

The order item is lumber (measured in cubic meters) necessary for reconstruction of houses after a hurricane landfall. Since lumber is produced out-of-state, procurement and distribution are managed by the Regional Distribution Center.

The Regional Distribution Center decides how much to ship to the regional stores. There are four regional stores in this simulation, Northwest (Tallahassee), Northeast (Dayton Beach), Southwest (St Petersburg), and Southeast (Miami) stores. Each regional store decides the degree to which to meet local demand. Each store's goal is to minimize its own operational cost (cost = shipping cost + inventory cost + lost sale cost). The goal of the Regional Distribution Center (Georgia) is to minimize overall cost including all stores. The Distribution Center can choose not to ship the ordered quantity to a store.

While there are a total of five rounds with four actual hurricane landfalls, the participants are unaware of this information. Each group is expected to make an inventory decision in each round after being presented with information such as store location, current inventory position, transportation cost, and holding costs.

Each "store" makes ordering decisions during the game. At the end of the game, each group's financial performance is tallied. Specific game rules are covered in slides 17 through 20 in the simulation slides (Please refer to Appendix C).

Ordering Rules

The simulation runs from July to the end of October

You can order at the start of each month, and receive deliveries at a regular ordering cost (\$5/order). These deliveries take 4 days to arrive.

You can make expedited ordering, which takes 2 days to arrive, at any time at a higher ordering cost (\$10/order)

Unit inventory cost per day (\$1/day) Lost sale cost (\$0.5/unit)

Note on Rules: For simplicity and time considerations, we run the simulation game starting from July to the end of October, with no starting inventory for each store, and with a set of make up costs. For additional complexity, the instructor may elect to permit students to hold inventory at the start of the simulation.

Demand Information

If a forecasted hurricane does not make landfall, then there is no demand. If a forecasted hurricane makes landfall, the demand is dependent on the hurricane's category:

Category 1:	0 cubic meter of lumber
Category 2:	10 cubic meters of lumber
Category 3:	20 cubic meters of lumber
Category 4:	40 cubic meters of lumber
Category 5:	80 cubic meters of lumber

If a forecasted hurricane makes landfall and it is category 5, all inventory is wiped out. The store hit by the hurricane is also charged the lost sale cost.

Demand is realized on the day after the hurricane makes landfall.

Weather Updates

Tropical storm alerts are available about 7 days before potential landfall Path forecast of a potential hurricane is available about 3 days before potential landfall This timing is approximate, because it is not possible to forecast how fast a hurricane will travel or what direction it will head.

Each of the hurricane scenarios used in this simulation corresponds with an actual hurricane documented in the NHC database. This makes the simulation very realistic.

SIMULATION

During the beginning of each round, students are presented with weather forecast information. The essential information includes current position of the storm, its size, and the predicted path in the next 5 days (in 24 hours intervals). Each group has 5 minutes to discuss its decision. At the end of each round, each group decides on the order quantity (zero means no order).

In making the ordering decision, students should consider the hurricane statistics included in the case appendices in conjunction with their current inventory position. For additional realism in simulation, the instructor can use blocks or other small items to represent units of lumbers. A simulation worksheet (Appendix D) can be used to keep track of the simulation as it progresses. If there is not enough time to tabulate the results during the class period, the instructor can proceed to the *Debriefing* section. Often, the result is straightforward. Students quickly recognize the complexity of decision making in this simulation.

Debriefing

Instructor may use these questions to lead the discussion during the debriefing process.

- 1. What influenced your decisions during the simulation?
- 2. How much was your cost?
- 3. How could you improve your results?

The first question is designed to have students reflect upon their decision making process during the simulation. Typical issues such as probability of landfall, hurricane category, inventory at hand, will likely be brought up.

The second and third questions are designed to invoke discussion on issues such as weather forecasting accuracy, delivery lead time, and coordination within supply chain.

A common question raised by students is whether they are allowed local level transfer of inventory between stores. We do not allow local level transfers in this simulation because this is not the key point we want to convey in this case. However, the overall performance of the system should improve if we were to allow it. In practice, the actual change (better or worse) will depend on the actual cost of inventory holding and transportation at the regional and local level.

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APPENDIX A

BACKGROUND INFORMATION ON ATLANTIC HURRICANES

Each year, the US Gulf Coast region is visited by a number of hurricanes. Each hurricane is rated on an intensity scale of category 1 (barely a hurricane) to category 5 (worst imaginable). "Major Hurricanes" are those in Categories 3, 4, and 5 with winds stronger than 110 miles per hour (50 m/s). Category 5 hurricanes are the most extreme but most rare (1935, 1969 - Camille, 2005 - Katrina).

HURRICANE STATISTICS (http://www.firstscience.com/site/articles/hurricanes.asp)

- Hurricane landfalls on the U.S. east coast were common during the 1940s through the mid 1960s.
- In the 1970s and 1980s, landfalls were few
- The 1995 through 1999 seasons inclusive had been the five most active in the last 100 years
- Now activity appeared to have returned to the high level at the immediate post-World War II period.
- From 1925 through 1995, 244 landfalls occurred.
- An average landfall would have resulted in \$1.5 billion in damage in 2005 prices.
- Major hurricanes accounted for 80% of the normalized damage, although they represented only 20% of occurrence.

A HURRICANE'S POWER

In the center of the hurricane is the cloud-free eye. In a hurricane, the strongest winds are near the surface and just outside the eye wall. A typical hurricane intensifies slowly, remaining in Category 1 or reaching 2 or even 3 before it runs ashore or drifts north out of the tropics. The strongest hurricanes, such as Andrew in 1992, intensify rapidly and go from Category 1 or 2 to Category 4 or 5 in just a day or two.

The following satellite image taken days before Hurricane Andrew made landfall in Florida in 1992 illustrate the size and power of a category 4 hurricane. The outline of Florida is shown at the upper left hand corner of the image.



HURRICANE ANDREW APPROACHING FLORIDA IN 1992 (Source: NASA)

The National Hurricane Center (NHC) observes the progress of each hurricane and updates the public on its progress. It releases a seven-day advance warning and a 3-day forecast of path and category of any hurricane on the Atlantic Ocean. The following is a typical 3-day forecast of hurricane path.



Depending on the strength of a hurricane when it makes landfall, there are different level of damages associated. Usually, a category 1 hurricane causes no significant damage to the properties on land. A category 2 or 3 hurricane is associated with significant damage. A category 4 hurricane, such as Andrew in

1992, will usually cause severe damage to properties reaching to billions of dollars. A category 5 hurricane is associated with level of damage that is usually classified as national disaster, such Katrina.

The following table shows the number of hurricane landfalls in US from 1851 to 2004, during hurricane seasons, organized by months, according to National Hurricane Center's data.

Area	Jun	Jul	Aug	Sep	Oct	All
U.S. (Overall)	2	4	26	43	17	92
Florida	0	1	6	19	9	35
(Northwest)	0	1	1	7	3	12
(Northeast)	0	0	0	1	0	1
(Southwest)	0	0	2	5	5	12
(Southeast)	0	0	4	8	3	15

The following table shows the strength of hurricane landfalls in US from 1851 to 2004, during hurricane seasons, organized by categories, according to National Hurricane Center's data.

Area	Category Number					All (1-5)	Major (3-5)
	1	2	3	4	5		
U.S. (Overall)	109	72	71	18	3	273	92
Florida	43	32	27	6	2	110	35
(Northwest)	27	16	12	0	0	55	12
(Northeast)	13	8	1	0	0	22	1
(Southwest)	16	8	7	4	1	36	12
(Southeast)	13	13	11	3	1	41	15

What are the odds of affecting the residence once a hurricane is within 100 miles? The following visual representation of the likelihood, Empirical Probability of a Named Storm," illustrates this issue. In this graph, the probability of residents' in Miami, Florida, being affected once a hurricane is within 100 miles is 0.48.

14



Chance that a tropical storm or hurricane will affect the area when it was within 100 miles (Data from 1944 to 1999, hurricane season, figure created by Todd Kimberlain)

The "Empirical Probability of a Named Storm" figure shows the likelihood that a region will be affected by a hurricane once it is within 100 miles in distance. In some locations, this likelihood may be much small because of some unique geographical characteristics. For example, the likelihood of Miami being damaged by a hurricane is almost 50% once a hurricane is within 100 miles. One the other hand, this likelihood is only 24% to 30% for the northwest region of Florida. The table before this figure shows the strength of landfall hurricanes historically. Thus, it conveys information on the level of damage to a region once a hurricane makes landfall at that region.



APPENDIX B FLORIDA STORE AND DISTRIBUTION CENTER LOCATIONS

This map displays locations of Home Depot stores in the State of Florida in 2004.



This map displays locations of Home Depot distribution centers for the simulation.

APPENDIX C

POWER POINT SLIDES FOR SIMULATION EXERCISE Simulation Slides

Please contact the author (khung@suffolk.edu) for the complete set of Power Point slides used for this simulation.

APPENDIX D

SIMULATION WORKSHEET

Hurricane Simulation Worksheet (Store)					
Location:					
Date	Order	Inventory	Lost Sale	Cost	Cumulative Cost
6/28		0			
7/1					
				Total Cost:	

FIDUCIARY FOLLY LEADS TO FIASCO: THE CASE OF CONSOLIDATED PIPELINE AND EQUIPMENT CORPORATION (CPEC)

Laura Sullivan, Sam Houston State University Robert Stretcher, Sam Houston State University Joey Robertson, Sam Houston State University

CASE DESCRIPTION

The primary subject matter of this case involves the agency relationship between Steve Shelton, a fiduciary (the accountant) and his client and friend, Paul Jameson. Paul's son, Jim Jameson, has brought a lawsuit against Paul and Steve, because of his dissatisfaction with the recent sale of his property. Secondary issues include gratuitous agent issues, agent liability, and confidential relationship liability. The case has a difficulty level appropriate for undergraduate Business Law or Accounting courses. The case can be taught in 1-2 class hours, depending on the desired detail level for the discussion. It should take approximately one hour of outside preparation by students.

CASE SYNOPSIS

Jim Jameson, former president of CPEC Pipeline and Equipment Corporation (CPEC) has brought an action against his father and his father's accountant. His father, Paul, is the 100% owner of CPEC, and has arranged the sale of the business to a third party for \$65 million. One year earlier Jim's employment as CPEC president had been terminated for alleged mismanagement. After Jim's termination Paul resumed duties as president of CPEC during the structuring of the sale of the business.

Following his termination, but prior to the sale of CPEC Jim was paid \$3.8 million by CPEC (at his father's direction) for a parcel of land Paul had essentially given to Jim five years earlier. The fair market value of the land at the time of this transaction was about \$1.2 million. The purpose of the purchase in excess of the actual value was to transfer an "inheritance" of sorts to Jim while avoiding the tax consequences of a gift tax. The burden of the tax was then Jim's, a further irritating aspect of the transaction.

Following the sale of CPEC Jim now claims the \$3.8 million he received for the land did not represent an amount acceptable for an inheritance. Jim also felt that the land was of substantially higher value to the firm, and that the sale of the business was somehow tied to the inclusion of the land. His conclusion was that the land is actually worth substantially more than the \$3.8 million he was paid.

Interestingly, if Jim's conclusion is correct, then the amount paid does not exceed the value of the land, and there would be less suspicion of a fraudulent avoidance of taxes by Paul. If Jim is wrong in his conclusion, Paul and the firm would be suspected of fraudulent avoidance of taxes, but would have greater

wealth to offer the firm's purchaser. The main question addressed by the case is whether Steve, the accountant for CPEC, owes a fiduciary duty to Jim in connection with this land sale.

INSTRUCTORS' NOTES

Suggested Teaching Approach

We suggest using this case after course coverage of agency theory to enhance understanding of agency theory, fiduciary duty and fraud.

We assign this case to students in the class time prior to the class scheduled for discussion. For the first business law course, we limit our coverage to questions 1-3 (below) but for higher level courses we often utilize questions 4-6.

To get maximum mileage from the case, we suggest that the students prepare their answers to the questions prior to any class discussion.

DISCUSSION QUESTIONS

1. What duty does an accountant owe his client?

An accountant owes his or her client a fiduciary duty. The accountant – client relationship is at its most basic an agency relationship. Any agency relationship creates the requirement of a fiduciary duty owed to the master (the client in this case).

2. What is an agency relationship?

An agency is a consensual relationship between two parties. In which one, the agent, acts on behalf of the other, the master or principal. The agent's action is subject to the master's control.

a. How does an agency relationship begin?

Agency requires a meeting of the minds between the parties. In addition, there must be some act of appointment of the agent. The key is the agreement of the parties. The agent must agree to act on behalf of the master or principal. Once the agency relationship begins the agent owes a higher duty to the master. The agent must not: 1) compete with the master; 2) relate all matters regarding the subject matter; 3) to deal openly and provide full disclosure; 4) duty of loyalty; 5) duty to obey instructions and 6) duty to act with care and skill which is standard or based on the skills of the agent.

In essence, the agent must put the master's best interests above his own. He owes this duty to the master.

b. Who bears the burden to prove that an agency relationship existed?

The law does not presume agency. The alleged master has the burden to prove than an agency relationship existed. The evidence presented by the alleged master must establish that he had the right to assign the agent's task and control the details and process by which the agent completes the task.

c. What liability does that pose to the agent?

If the agent does not hold the master's interests above his own he can be found liable for breach of his fiduciary duty to the master.

3. What is a fiduciary duty?

A duty of utmost loyalty and good faith.

a. When does one owe a fiduciary duty?

An agent owes a fiduciary duty to his or her master/principal. The fundamental element of a fiduciary duty is that the agent subordinate his or her self-interest to the interest of the master or principal. If this duty is breached the master/principal can sue the agent.

b. Can one owe a fiduciary duty even if one is not paid for his or her services?

Yes.

c. If "yes" what is the name for this duty?

Gratuitous Agency theory. A gratuitous agent is one who receives no compensation for his or her efforts.

4. Did Jim appoint Steve as his agent?

No. There was no meeting of the minds. Steve did not agree to serve or act as Jim's agent. Jim was well aware that Steve was in fact Paul's agent and acting solely for his benefit.

5. If Steve was, in fact, Jim's agent – what type of agent was he?

Gratuitous Agent.

6. If Steve was not Jim's agent, was there any relationship between the accountant and son at all?

Yes. If Steve is Paul's agent and not Jim's the relationship between Steve and Jim is that of an agent and a third party. Since Steve represents Paul, and Jim in his dealings with the agent/principal pair

has changed his position by relying on Steve's representation of Paul, Jim has rights and recourses against Steve even though Steve is not his agent.

7. What is fraud?

Deceitful conduct designed to manipulate another person to give something of value by (1) lying; (2) by repeating something that is or ought to have been known by the fraudulent party as false or suspect or (3) by concealing a fact from the other party which may have saved that party from being cheated. The existence of fraud will cause a court to void a contract and can give rise to criminal liability.

8. Is there any evidence of fraud on Jim's part?

Yes. Jim may have committed fraud against CPEC when he was embezzling money from the company during his service as the company's president.

9. Is there any evidence of fraud on Paul's part?

Yes. When Paul agreed to purchase the parcel of land from Jim paying far more than the actual value of the land Paul may have committed fraud against the government in an effort to avoid paying certain inheritance taxes.

10. If the sale of the parcel of land from Jim to CPEC for 3 times its actual value is fraud, who is liable?

It depends, but most likely Paul and Steve. A principal is generally liable for the actions of their agents, but when it comes to criminal activity a principal is only liable if they approved the activity or conspired with the agent to commit the crime.

11. If Paul relied on Steve's expertise in setting up the sale of the land, does Paul have any recourse against Steve?

Yes. Although Paul may be liable for an improper sale of the land he may be able to recover from Steve through indemnification. Although a principal is generally liable for the actions of his agent, a principal can also rely on the expertise of his agent. The facts of this case indicate that the sale of the land for an inflated value was the agent's idea. If Steve knew of should have known this sale was improper, and Paul relied on Steve's expertise, Paul may be able to recover any fines or expenses he is forced to pay through indemnification. Indemnification allows either an agent or principal to recover from the other if they are subjected to legal obligations due to the fault of the other.

12. Is it possible that a court could find there was no agency relationship in the sale of land in excess of its true value?

Yes. Agency agreements can be entered into for any legal purpose. If the sale of the land for an inflated value was an illegal purpose, there may not have been an agency relationship for that specific purpose.

EPILOGUE

This case demonstrates an example of the type of liability an accountant might face. There are serious consequences for even the best intended actions. It is important to realize when an individual is acting as an agent for another person and the potential liability for such actions. In the real life scenario this case represents, Jim lost his case against Steve. The jury decision was 11 to 1. Steve continues to practice as an accountant.

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ABC COATINGS, INC.: EQUIPMENT REPLACEMENT ANALYSIS

Sharad Maheshwari, Hampton University P. Michael McLain, Hampton University Robert Stretcher, Sam Houston State University

CASE DESCRIPTION

This case presents a simple scenario to reinforce the concept of capital financing. The case involves a small manufacturing company which specializes in the powder coating technologies for metal components for automobile industry. The company is considering upgrading its current plant & equipment that would make the process of powder coating of metal surfaces more efficient. While improvement the technical efficiency is substantial with the proposed plant & equipment, however, the improvement adds a small increment in the financial benefits. The financial savings are less due to the capital cost of the new plant as well as the added cost of an IT worker. That is, the proposed upgrades are financially unadvisable. The objective of the case is to illustrate the difference between technical efficiency and financial feasibility. The situation is a relatively simple one, appropriate for use in undergraduate production/operations management, managerial accounting or financial management courses. The case should require minimal preparation by students and should take no more than one hour to complete in-class.

CASE SYNOPSIS

The coating of industrial parts and consumer goods is one of the most commonly used techniques for metal surfaces to provide a finishing layer, to enhance protection from corrosion, to change the surface properties, and/or to add sparkle or shine. Most common coating techniques involved solvent based coating like basic painting. However, solvent-based coating has relatively poor durability. To improve the durability and reduce cost, several industries are moving towards powder coating techniques for metal surface preparation. The powder coating is increasingly used in many industries like household appliances, automotive parts, construction machinery, building material, military equipment, furniture, and others. Powder coating also has specialty usage like application of non-stick coating on pots and pans. Powder coating comprises approximately 20% of the market for metal finishing where it competes directly with traditional liquid finishes like paint.

ABC Coating is a manufacturing vendor to several automotive part manufacturing companies in the country. It operates as a turnkey vendor to these companies and provides coating services on a variety of parts. Most of its work involves coating of metallic automotive parts. It has a turnover of about \$10 million and is growing at a good pace of 2-5% per year in the last four years. Most of its growth is coming due to reduced competition, as several of powder-coating companies have closed due to overseas competition.

However, this is also putting pressure on the ABC Coatings to cut cost to meet the overseas competition. This is the main justification for the ABC coating to update and upgrade its facilities. It hopes to reduce labor cost as well to improve product cycle time.

INSTRUCTORS' NOTES

ABC Coatings, Inc. is a very small business with turnover approximately \$10 million according to its income statement. The overall profit is very small, approximately 1.5% of sales. Hence, the company is trying to find ways to improve productivity and profit margins. Modernizing the old labor intensive plant with a computer controlled new plants is one of the options under considerations. The students have to find out if the new plant is a good option financially.

The solution of this case would demonstrate to the students that technology based decisions made without financial considerations can be incorrect. Many corporations reported problems after much touted IT projects. Among others, these problems included not realizing profitability gains as expected. That is, the new technology may not be the answer to all the problems of a given business.

The calculations in this case are very straight forward. Students have to calculate overall saving from the new system. That is, the total cost differential between old and new systems is to be calculated. The costs involved in the calculations will be labor, utility, cleanup, interest and depreciation cost. Total cost differential between old and new systems will also include depreciation tax shield allowed for the new equipment. The system decision will be based on the present value of the saving over the life of new plant compared to the total investment on the new plant.

COST AND OTHER CALCULATIONS

The steps in calculations to justify the new systems:

- Labor cost.
- Benefit cost.
- Utility cost (in this case cost differential is provided.)
- IT support cost for new plant.
- Expected clean-up cost.
- Interest cost for the new plant financing.
- Depreciation cost for the new plant.
- Depreciation tax shield for the new plant.
- Annual savings (loss) from the new plant.
- Net present value of the savings over the life of the new plant.
- Compare net present value of the saving with capital cost of the new plant.
- Recommendation.

The labor cost calculations are presented in the Tables 1 and 2. The hourly workers cost is calculated based on 2000 hours and the salary rate. The benefit cost is calculated as 30% of the total salary paid for

hourly workers and 40% of total paid for yearly salaried workers. The overall payroll cost is the sum of salaries paid and benefits cost incurred.

Table 1: Yearly Labor Cost in the Old Plant			
Type of Worker	Number	Cost (Hourly or Salaried)	Payroll
Pallet Movers (Hourly)	5	\$10.00	\$100,000.00
Machine Operators (Hourly)	12	\$15.00	\$360,000.00
Line Workers (Hourly)	10	\$16.00	\$320,000.00
Subtotal (Hourly Workforce)	27		\$780,000.00
Supervisors (Salaried Yearly)	3	\$85,000.00	\$255,000.00
Schedulers (Salaried Yearly)	3	\$45,000.00	\$135,000.00
System Operators (Salaried Yearly)	0	\$75,000.00	\$0.00
Subtotal (Salaried Workforce)	6		\$390,000.00
Benefit (Hourly Worker (30%))			\$234,000.00
Benefit (Salaried Worker (40%))			\$156,000.00
Total Payroll Cost	33		\$1,560,000.00

Table 2: Yearly Labor Cost in the New Plant				
Type of Worker	Number	Cost (Hourly or Salaried)	Payroll	
Pallet Movers (Hourly)	2	\$10.00	\$40,000.00	
Machine Operators (Hourly)	5	\$15.00	\$150,000.00	
Line Workers (Hourly)	5	\$16.00	\$160,000.00	
Subtotal (Hourly Workforce)	12		\$350,000.00	
Supervisors (Salaried Yearly)	2	\$85,000.00	\$170,000.00	
Schedulers (Salaried Yearly)	1	\$45,000.00	\$45,000.00	
System Operators (Salaried Yearly)	1	\$75,000.00	\$75,000.00	
Subtotal (Salaried Workforce)	4		\$290,000.00	
Benefit (Hourly Worker (30%))			\$105,000.00	
Benefit (Salaried Worker (40%))			\$116,000.00	
Total Payroll Cost	16		\$861,000.00	

The utility cost differential is given as \$18,000 per year (\$1500 per month). The new plant is using more mechanized machine and will use slightly more electricity. Similarly, new plant will have an additional cost of \$25,000 per year for the IT support. This cost is not incurred in the old systems. The chemical spills are part of the process and hence, company incurs cleanup cost. The new plant is cleaner and is expected to

lower the overall cleanup cost. Table 3 shows the calculations for cleanup cost. Expected cost of cleanup is calculated by multiply probability with cleanup cost.

Table 3: Expected Cleanup Cost						
Old System			New System			
Type of Cleanup	Cost	Probability	Expected Cost	Cost	Probability	Expected Cost
Major	\$10,000,000	1.00%	\$100,000	\$10,000,000	0.10%	\$10,000
Minor	\$50,000	100.00%	\$50,000	\$10,000	100.00%	\$10,000
Total			\$150,000			\$20,000

The cost of debt financing for new plant, depreciation and depreciation tax shield are calculated next. These calculations only apply to the new plant, as the old plant is fully paid and depreciated. Table 4 shows these costs. The interest cost is based on the simple yearly interest at the rate of 8%. The cost of new plant is \$2,850,000.00. Therefore, yearly interest cost will be \$228,000.00 (\$2,850,000*.08=\$228,000.) The straight-line depreciation method is used for the new plant for its useful-life of 10 years. The yearly depreciation cost will be \$285,000.00 (\$2,850,000/10 = \$285,000.00.) Depreciation tax shield is saving of corporate income tax, hence, calculated as depreciation multiply corporate tax rate. The yearly depreciation tax shield will be \$99,750.00 (\$285,000*0.35=\$99,750.)

Table 4: Interest and Depreciation Cost			
Туре	Rate	Cost	
Interest Cost	8.0%	\$228,000	
Depreciation (10 yr Straight line)	10.0%	\$285,000	
Depreciation Tax Shield (35% Corp Tax Rate)	35.0%	-\$99,750	

The overall savings from the new system is to be calculated next. Total costs of the old and new systems are shown in the Table 5.

Table 5: Total Cost Schedule of Old and New Systems			
Type of Cost	Old System	New System	
Overall Payroll	\$1,560,000	\$861,000	
Utility	\$0	\$18,000	
IT Support	\$0	\$25,000	
Cleanup	\$150,000	\$20,000	
Interest	\$0	\$228,000	
Depreciation	\$0	\$285,000	
Depreciation Tax shield	\$0	-\$99,750	
Total	\$1,710,000	\$1,337,250	
Savings from the New Plant		\$372,750	

The new plant will save company \$372,750 annually. It is assumed that the company will realize these saving each year over the life of the loan. The justification of the new plant will be based on the fact if net present value of the saving is more than the cost of the plant. The net present value at 8% over 10-year is calculated by multiplying PVIFA(r,n) factor with the annual savings (Excel formulae can be used as well.) PVIFA(8%,10) is 6.710081 and saving rate is \$374,750 per year. The net present value of this saving will be \$2,501,183 (6.710081*374,750). This is less than the cost of the new plant \$2,850,000. Therefore, this plant investment is not justified despite the substantial savings in the labor cost.

THE BANKRUPTCY OPTION: DOES THE UNITED AIRLINES MODEL WORK FOR GENERAL MOTORS?

James A. Martin, Washburn University Janice L. Schrum, Washburn University

CASE DESCRIPTION

This case analyzes the actions taken (or potentially taken) by two financially distressed American corporate icons. The first company, United Airlines (UAL), awash in debt, filed for bankruptcy in 2002. Until its bankruptcy filing, UAL had hoped for government loan guarantees to bail it out. When these guarantees failed to materialize, UAL was left owning a fleet of planes twice the size it needed, (Cite: Disunited) paying wages pursuant to an uncompetitive union wage structure, and experiencing shrinking revenues due in part to lower air travel post 9/11. It filed for bankruptcy in 2002 and emerged as a new company in 2006.

General Motors (GM), the second company, also faced the possibility of bankruptcy in 2008. At that time, it operated a number of manufacturing plants manned by unionized American employees who earned tens of dollars per hour more than GM's international competitors. This considerable wage/benefit cost disadvantage coupled with a shrinking revenue base, aging manufacturing capacity, more dealers than it needed, and rising debt levels pushed GM towards bankruptcy. At the end of 2008, GM too awaited a government bailout.

This case looks at financial and operating restructuring opportunities available to a company through bankruptcy. First, the case looks at interest savings achieved by UAL after emerging from bankruptcy. The case posits the question, are these savings (attributed to UAL's lower levels of debt), available to GM if it filed for bankruptcy protection?

This case also looks at the operating cost savings demonstrated by UAL following emergence from bankruptcy. Although in a different industry, the case leads students through calculations of operating cost savings potentially available to GM through bankruptcy. These include costs such as wages, benefits, and supplier costs (if GM follows the UAL model).

Finally, the case looks at issues pertaining to organized labor and, in particular, legacy costs. These costs are credited with handicapping and diminishing the competitiveness of both American auto manufacturers and older airlines worldwide. "Legacy costs" is the term used for worker pensions and health care benefits that were negotiated in past collective bargaining agreements and incurred by the organization under different leadership or when the organization's priorities and resources were different (Cooney, 2002, 2005). Because of benefits established and enhanced through several decades of collective bargaining, the automobile industry finds itself supporting a large number of retirees and health care beneficiaries (Cooney, 2002, 2005).

Along with legacy costs, American autoworkers remain among the highest paid manufacturing workers in the world; sometimes paid when they do not work via the "jobs bank". The "jobs bank" is a program which gives American automobile union workers most of their pay and benefits while they are laid off, eliminating the need for such employees to seek unemployment benefits (Langlois, 2009). Another potential source of financial woe for the American auto industry is executive compensation. Rick Wagoner, CEO for GM, is paid a yearly compensation totaling around 14.4 million (Farago, 2008, Forbes, 2009). Many hate to see a wealthy CEO making millions of dollars with a golden parachute for running a company that might ultimately declare bankruptcy. Therefore, this case addresses the implications of managerial decision-making especially negotiations with union representatives' demands and/or concessions that are potentially needed to ultimately keep the American automobile industry solvent and competitive.

The case has a difficulty level of 4-5 and is recommended for college seniors and first year MBA students. With three major categories of issues covered (interest savings achievable through bankruptcy, operating cost savings achievable through bankruptcy, and issues related to bankruptcy and labor unions), it is expected the case will take three hours of class time. Students aware of current business events (such as the potential government bailout of GM) will require little or no outside preparation. Students who are unaware of the potential GM government bailout will need to review current business periodical articles on General Motors. Total outside of class preparation should not exceed one hour. (Note: Whenever possible, company financial data was taken directly from company published financial reports. When amounts were not specifically disclosed, estimates were used, based upon actual disclosed data.)

CASE SYNOPSIS

It is early 2008. The GM board of directors is meeting to discuss 2007 financial results. The results are not good. The company is preparing to announce that it just lost \$38 billion and is \$184 billion in debt. You, as a board member, have heard management's explanations of the losses for sometime now. You know that GM has too many manufacturing facilities, but union contracts prevent it from shutting them down. You know the average hourly wage/benefit package of a GM factory worker is \$30 per hour higher than its non-union competition. However, union contracts bar it from cutting employee and retiree medical/pension costs that cause the cost differential.

Management has some good news. Sales are up and cost control efforts are starting to pay off. Some of the unprofitable GM dealerships are closing which is good news as you have too many dealers. However, the company is running out of cash. Management reports that under current conditions, it may have enough cash through 2009. However, if a recession occurs, it may be out of cash in 2008. Discussion turns to government bailouts. Board members bristle at government intervention when discussion focuses on the strings which may be attached.

Finally, a board member mentions the "B" word, and suggests filing bankruptcy and getting a fresh start. (Several airlines have done it and are up, operating, and profitable.) Members squirm in their chairs as a different board member discusses her experience with another bankrupt company. You are uneasy and ask management to investigate GM's options.

This case leads students through a three pronged approach of applying the airline bankruptcy model to GM. Discussion questions focus students on bankruptcy's potential impacts on debt and interest, operating costs, and labor unions. Income statement and balance sheet assignments are also provided.

INSTRUCTORS' NOTES

Recommendations

The case is a timely analysis of a current business dilemma facing General Motors. (GM) Most students, who follow national news, are aware that GM is undergoing financial duress. Slow selling cars and a cost structure burdened with legacy costs associated with its union contracts has pushed GM to the brink of bankruptcy. GM has resisted bankruptcy and placed its hopes for survival on a government bailout (infusions of capital) instead. With these infusions of capital GM hopes to stay in business and continue its cost reduction, debt reduction, and revenue enhancement efforts.

Most students may not be aware that United Airlines (UAL) faced a similar quandary in 2002. Faced with a noncompetitive price structure and a highly unionized workforce, UAL chose to enter bankruptcy. UAL exited bankruptcy in 2006 with a much lower debt level and lower cost structure. UAL was profitable in 2007.

Before handing anything out, the instructor should "seed" the class with some anticipatory questions such as:

- 1. What is going on in the US car manufacturing industry today?
- 2 .How is GM doing?
- 3. Is GM a company you expect to be in business a year from now?
- 4. What do you think about GM filing for bankruptcy?
- 5. Do you think the US government should bailout GM to avert bankruptcy?

Additional "seed" questions should be directed towards the airline industry.

- 1. Can you think of another major US industry which recently had some of its major participants undergo bankruptcy or the threat of bankruptcy?
- 2. Is anyone familiar with UAL and their 2002 bankruptcy and financial restructuring (UAL is profitable today.)?
- 3. If an airline could file for bankruptcy and return as a viable company, could the same be done for a car company? Why or why not?

There are no right or wrong answers to these questions. The questions are only meant to engage the students and prepare them for the upcoming analysis.

Once the anticipatory questions are complete, the instructor should distribute a copy of the body of the case to each student, directing the student to read. After reading, additional time to go over pertinent "seed" questions again could be provided at the instructor's option.

Following any discussion of the body of the case or re-visitation to the seed questions, the provided discussion questions should be answered. The questions are divided into three categories. (Debt, Operations, and bankruptcy and labor unions). It is recommended that each category be discussed separately and that all questions not be handed out at once. Further, the questions add information to the case incrementally. As such, they build upon each other. For that reason, the questions can be discussed using one of the following three methods:

- a. Questions are not handed out at all. Instructor reads the first question in the first category and students use the body of the case, personal knowledge, and other resources (optional) to analyze and respond in writing or verbally. Instructor can lead students through analysis when necessary. Following completion of the first category, second and third category questions can be discussed as time permits.
- b. Questions related to the first category are parsed and printed on sheets of paper, then handed out individually. Although printing one question per page is not recommended, no more than three questions per page is considered optimal. Instructors should review questions in advance to determine the appropriate grouping of questions based upon the level of class financial expertise and time available. Following completion of the first category, second and third category questions can be discussed as time permits.
- c. All questions related to the first category are printed and distributed. Students are directed by instructor as to how many questions on the list to complete prior to instructor lead discussion. This process continues until category one discussion questions have been answered and discussed. Following completion of the first category, second and third category questions can be discussed as time permits.

CASE OVERVIEW

The case includes a description of business operations of GM for two years, 2002 and 2007. It also includes a highly summarized GM income statement and balance sheet for the same periods. A five year period was chosen because comparison of the descriptions and financial statements over this period of time shows noticeable changes in GM's operating cost structure and (a deteriorating) level of debt. This period of time also mirrors the period of time analyzed for the comparable company in the case, UAL.

The case also includes a description of business operations of UAL for two years, 2002 and 2007. It includes a highly summarized UAL income statement and balance sheet for the same periods. A five year period was chosen because comparison of the descriptions and financial statements over this period of time shows noticeable changes in UAL's operating cost structure and (an improving) level of debt. The first year (2002) is the year in which UAL went into bankruptcy. The last year (2007) is the first full year of operations for UAL after emerging from bankruptcy.

Three categories of analysis are provided for use in this case. Instructors can use any combination of the categories for their instruction.

- 1) Category 1: Debt- The discussion questions lead the students through calculations which illustrate the following concepts:
 - a) Calculation of leverage (debt to total capital).
 - b) Bond ratings and changes due to financial improvement or deterioration.
 - c) Changes in the financial profile of a corporation and resulting interest rates charged.
 - d) Earnings impact of interest rate changes (pre and post tax).
 - e) Impact of bankruptcy on leverage and interest rates.
- 2) Category 2: Operations- The discussion questions lead the students through calculations which illustrate the following concepts:
 - a) Calculation of costs per unit of output (UAL units = passenger miles; GM units = vehicles sold).
 - b) Identification of cost components with differing characteristics. (UAL = jet fuel vs. other costs; GM = administrative costs vs. structural costs)
 - c) Impact of bankruptcy on operating costs.
 - d) Earnings impact of operating cost changes (pre and post tax).
- 3) Category 3: Bankruptcy and labor unions- The discussion questions lead the students through the following concepts:
 - a) Examination, prioritization, and negotiation of legacy costs such as:
 - i) health care
 - ii) retirement
 - iii) job banks.

DISCUSSION QUESTIONS

Category #1: Debt

- 1. Using UAL's financial statements, calculate the amount of company leverage (debt to total assets) in 2002 and 2007.
 - *2002: 26,137 / 23,656 = 110.49%*
 - 2007 21,431 / 24,220 = 88.48%

This reflects an improvement in UAL's level of leverage from 2002 to 2007. However, most would consider UAL to still be highly leveraged in 2007.

2. Following UAL's bankruptcy filing in 2002, S&P downgraded UAL's senior unsecured debt to D. Upon emerging from bankruptcy in 2007, S&P gave a family rating of B to UAL. What

impact should the decrease in leverage by 2007 and S&P's debt rating upgrade have upon UAL's borrowing costs in 2007?

OR

Alternate Discussion Question 2): Access historic 10-K filings for UAL to determine the company's S&P senior unsecured debt rating in 2002 and the company's 2007 S&P family rating. What impact should the noted improvement in leverage by 2007 and S&P's ratings changes have upon UAL's borrowing costs in 2007?

In general, corporate deleveraging and improvement in bond ratings are positive credit developments and all other things being equal should lead to a lower overall cost to borrow (interest rate) for UAL.

3. UAL's 2002 average borrowing cost (interest rate) was approximately 6.2%. UAL's 2007 average borrowing cost was approximately 6.3%. Why would UAL's average interest rate increase between 2002 and 2007, given UAL had come out of bankruptcy, had decreased its level of leverage, and had improved its debt credit rating by 2007?

Students may struggle with this because logically one would expect a company's borrowing costs to decrease under those circumstances. Possible student answers:

a. Borrowing costs for all entities may have risen dramatically between 2002 and 2007 due to general market conditions. In that scenario, any interest savings UAL may have gotten by escaping bankruptcy would have been offset by overall higher interest rates in the market in general.

Instructor Response: Although the overall borrowing environment did change between 2002 and 2007, it does not explain UAL's increase in costs. In fact, the average 20 year Treasury bond rate actually decreased from 4.83% to 4.50% during the 2002 to 2007 time period.

b. UAL's debt maturity dates and duration may have changed dramatically between 2002 and 2007. Companies can affect their borrowing costs dramatically depending on the length of time they choose to borrow. In other words, UAL's decisions on which part of the yield curve to borrow at may have changed, offsetting the benefit of coming out of bankruptcy.

Instructor Response: While in theory, everything suggested is possible, UAL management did not choose to dramatically change maturity dates or duration.

c. Lenders likely viewed UAL as still a risky company to lend to following emergence from bankruptcy. As such interest rates would not be reduced until UAL

demonstrates its post-bankruptcy business plan will be successful. UAL's postbankruptcy leverage (88.48%) and bond rating (B) are both improvements over 2002 levels but still reflect considerable default risk.

Instructor Response: This is the most likely reason.

- 4. Using GM's financial statements, calculate the amount of company leverage (debt to total assets) in 2002 and 2007.
 - 2002: 363,134 / 370,782 = 97.94%
 - 2007 184,363 / 148,883 = 123.83%
- 5. GM's S&P corporate bond rating went from BBB in 2002 to B in 2007. Given this downgrade and the additional leverage at GM, would you expect the average GM borrowing costs to increase between 2002 and 2007?

OR

Alternate Discussion Question 2): Access historic 10-K filings for GM to determine the company's S&P corporate bond rating in 2002 and the company's 2007 S&P corporate bond rating. What impact should the noted deterioration in leverage by 2007 and S&P's bond ratings changes have upon GM's borrowing costs in 2007?

In general, increases in leverage and deterioration in bond ratings are negative credit developments and all other things being equal should lead to an increase in borrowing costs for GM. In fact GM's average borrowing interest rate went from approximately 5.87% in 2002 to 7.85% in 2007 (or an increase of nearly 2%).

6. GM had \$38 billion in interest bearing debt (average rate = approximately 7.85%) at the end of 2007. If GM could refinance this debt at its 2002 approximate average rate of 5.87%, how much could it save in interest costs?

38,000,000,000 X (.0785-.0587) = \$752,400,000

7. If GM's marginal tax rate is 40%, what would be GM's after tax savings of refinancing its \$38 billion of interest bearing debt (current rate = 7.85%) at 5.87%?

\$752,400,000 X (1 - .40) = \$451,440,000.

8. Given your knowledge of UAL's change in borrowing costs post-bankruptcy, would you expect GM to be able to file for bankruptcy, restructure like UAL, and emerge from bankruptcy and able to borrow at its old average 5.87% rate (and save \$451,440,000)?

A lesson students should have learned in their analysis of UAL is that once a company files for bankruptcy and emerges, "all is not forgotten" and the company will have to prove its business plan can be successful before achieving all its potential interest savings. Another lesson observable from UAL's bankruptcy is that a company's borrowing costs also depend upon how much leverage the company still has post-bankruptcy and what type of bond ratings the company has post-bankruptcy. If GM were to file for bankruptcy, emerge with a capital structure and bond ratings similar to UAL's, it would be very unlikely the company could generate the after-tax interest savings calculated in 7) above.

Students may incorrectly think that a bankruptcy filing solves the corporation's problems. This is far from the case. Students should exit this section with two key learnings:

- a. Sizeable interest savings may be attainable through the deleveraging of a company and improvement of credit ratings. Those interest savings may be large, but they alone will not make a company successful and profitable. Further, these interest savings may not be evident immediately upon exiting bankruptcy. Additional time may be required for the company to successfully execute its post-bankruptcy business plan before lenders will lend at lower interest rates.
- b. Other changes in the bankrupt business operations must be implemented in order for the company to leave bankruptcy and return to profitability. Product lines and revenues must be examined and cost controls must be put in place. This comment provides a good segue to Category #2.

Category #2: Operations (United Airlines)

1. Using UAL's 2002 and 2007 10-Ks, identify 2002 and 2007 revenue passenger miles. Calculate 2002 and 2007 UAL EBIT per passenger mile. Use this information to fill in the appropriate cells on the lower half of Exhibit 1. What conclusions can be drawn following analysis of UAL's pre-bankruptcy and post bankruptcy EBIT per passenger mile?

OR

Alternate Discussion Question 1): UAL had 109,460,000,000 and 117,399,000,000 revenue passenger miles in 2002 and 2007 respectively. Use this information to calculate EBIT per passenger and fill in the appropriate cells on the lower half of Exhibit 1. What conclusions can be drawn following analysis of UAL's pre-bankruptcy and post bankruptcy EBIT per passenger mile?

2002 EBIT per Mile: -3012 / 109,460 = -\$.0275

2007 EBIT per Mile: 1037 / 117,399 = \$.0088

UAL's *EBIT* per mile has clearly improved from 2002 to 2007 (-\$.0275 to \$.0088). This is a positive development. Potential causes for this are an increase in revenue per passenger mile, additional passenger miles flown (further spreading fixed costs), and/or cost reductions.

2. Calculate UAL's revenue per passenger mile for 2002 and 2007.

2002: 13,916 / 109,460 = \$.1271

2007: 20,413 / 117,399 = \$.1739

3. Using the revenue per passenger mile calculations, quantify the additional EBIT generated by UAL in 2007 due to the increase in revenue per mile (price increases).

117,399 X (.1739 - .1271) = \$5.494 billion

4. Using UAL's 2002 and 2007 10-Ks, identify 2002 and 2007 revenue passenger miles. Use this information to complete the remaining shaded cells on the lower half of Exhibit 1.

OR

Alternate Discussion Question 4): UAL had 109,460,000,000 and 117,399,000,000 revenue passenger miles in 2002 and 2007 respectively. Use this information to complete the remaining shaded cells on the lower half of Exhibit 1.

2002 Total Cost per Mile: (15,007 + 1921) / 109,460 = \$.1547 2007 Total Cost per Mile: (14,103 + 5003) / 117,399 = \$.1627

2002 Fuel Cost per Mile: 1921 / 109,460 = \$.0175 2007 Fuel Cost per Mile: 5003 / 117,399 = \$.0426

2002 Nonfuel Cost per Mile: 15,007 / 109,460 = \$.1371 2007 Nonfuel Cost per Mile: 14,103 / 117,399 = \$.1201

5. UAL's total operating costs per passenger mile actually increased from UAL's pre-bankruptcy (2002) operations to its post-bankruptcy (2007) operations. What conclusions can be drawn regarding the success or failure of UAL's efforts to reduce costs through the bankruptcy process?

UAL's total costs per passenger mile did increase between 2002 and 2007 (.1547 to .1627). This however includes a dramatic increase in fuel costs per mile during the period (.0175 to .0426). Cost savings or cost increases related to fuel were not primarily the result of the bankruptcy process.

Rather they reflect an overall increase in the cost of fuel in this time period experienced by all airlines.

When looking at savings derived through the bankruptcy process, a more useful metric to examine is the change in the nonfuel cost per mile during the 2002-2007 time periods. During the 2002-2007 period, nonfuel operating costs per mile decreased from \$.1371 to \$.1201 or a decrease of 12.40%.

6. Using the nonfuel cost per passenger mile calculations, quantify the additional EBIT generated by UAL in 2007 due to its decrease in nonfuel costs per mile.

117,399 X (.1371 - .1201) = \$1.996 billion

7. Do you agree with the statement that UAL's 2002-2007 increase in EBIT and its return to profitability is more a result of increased revenue per mile (price increases) rather than bankruptcy related cost reductions?

Students may note that \$5.494 billion of EBIT was generated as a result of price increases (Discussion question # 3) while \$1.996 billion of EBIT (Discussion question # 6) resulted from nonfuel cost reductions. However, the question's blanket assertion is an oversimplification and not completely accurate. During this period (2002-2007), most major airlines were unprofitable and several large airlines filed for bankruptcy. Most of UAL's competitors shared some of UAL's financial problems: high labor costs, excess leased aircraft, 911 related costs, and too much debt. The industry wide spike in fuel costs further exacerbated the problem. Faced with near certain bankruptcy, all major airlines implemented price increases to cover the fuel cost increases during the 2002-2007 period.

UAL did benefit from the ability to raise prices in a very competitive market place. The fact that UAL's competitors were too financially weak to absorb the additional fuel costs without also raising prices benefitted UAL. However, without the bankruptcy, UAL would be still stuck with an uncompetitive cost structure. Absent the cost reductions UAL obtained in the bankruptcy process, it may have not been able to continue operations and would have most likely gone out of business (even with the fuel related price increases). As such, UAL's return to profitability was dependent on both the ability to raise prices and its bankruptcy related cost reductions.

Category #2: Operations (General Motors)

8. Using GM's 2002 and 2007 10-Ks, identify 2002 and 2007 vehicles sold. Use this information to complete the shaded cells on the lower half of Exhibit 3.

OR

Alternate Discussion Question 8): GM had 8,525,000 and 9,370,000 vehicles sold in 2002 and 2007 respectively. Use this information to complete the shaded cells on the lower half of Exhibit 3.

2002 EBIT per vehicle: \$9,795,000,000 / 8,525,000 = \$1028 2007 EBIT per vehicle: -\$4,390,000 / 9,370,000 = -\$468

2002 SG&A per vehicle: \$23,624,000,000 / 8,525,000 = \$2771 2007 SG&A per vehicle: \$19,253,000 / 9,370,000 = \$2055

2002 Cost of Sales per Vehicle: \$153,344,000,000 / 8,525,000 = \$17,988 2007 Cost of Sales per Vehicle: \$166,259,000,000 / 9,370,000 = \$17,744

2002 Total Cost per Vehicle: (\$23,624,000,000 + 153,344,000,000) / 8,525,000 = \$20,759 2007 Total Cost per Vehicle: (\$19,253,000 + 166,259,000,000) / 9,370,000 = \$19,799

9. Calculate the percentage change between 2002 and 2007 for the total cost for GM to manufacture and sell a vehicle.

(20,759 - 19799) / 20759 = -4.62%

10. Sales, General, and Administrative (SG&A) expenses include much of a corporation's overhead and corporate staff expenditures (e.g. executive salaries, legal, accounting, and human resource management expenses etc.). What was the percentage change between 2002 and 2007 in GM's SG&A expense per vehicle?

(2771 - 2055) / 2771 = -25.8%

11. Costs of Sales expenses include most of the direct costs to manufacture vehicles. What was the percentage change between 2002 and 2007 in GM's Cost of Sales per vehicle?

(17,988 - 17,744) / 17,988 = -1.4%

12. Why did SG&A expenses (Question #9) decrease at a much greater rate than Cost of Sales expenses (Question # 10)?

Most SG&A costs involve "headquarter" costs. Many of these "headquarter" functions involve the cost of employees who work in office and clerical positions and who may not be part of a union. Reductions in manpower levels, work hours, pay rates, and benefits are generally easier to accomplish with a nonunion workforce than in a unionized environment such as a GM manufacturing plant. These costs could also be for contractors or outside vendors. Cost reductions are also

generally easier to accomplish with contractors than in a unionized environment such as a GM manufacturing plant.

13. Between 2002 and 2007, UAL went through bankruptcy and was able to decrease its total costs per passenger mile (excluding fuel) by 12.40% (Question 4). Between 2002 and 2007 GM avoided bankruptcy and was able to reduce its costs to build and sell a vehicle by 4.62% (Question 9). On a pro-forma basis, calculate the additional cost savings for a car manufactured by GM, if GM could reduce its costs through bankruptcy at the same level as UAL did during the 2002-2007 period. Use 2007 GM costs to calculate the savings.

Pro-forma cost to build a car in 2007: 20,759 X (1 - .1240) = \$18,185. Additional savings per car (from actual 2007): \$19,799 - 18,185 = \$1614

14. Calculate the 2007 total savings to GM if its number of cars sold remained unchanged from actual 2007 and its manufacturing/distribution costs decreased by the amount calculated using UAL's cost reduction experience (Question 13).

9,370,000 X 1614 = 15,123,180,000.

15. If GM's marginal tax rate is 40%, what would be GM's after tax savings from reducing its manufacturing/distribution costs by the amount calculated in 14?

15,123,180,000 x (1-.40) = 9,073,908,000.

16. Complete the shaded sections of the following Table:

	(000,000)
2007 Actual GM Net Income	
Potential After-tax Interest Savings (Question Debt #7)	
Potential After-tax Operating Savings (Question Operations #15)	
Pro-forma 2007 GM Net Income	

(000,000)

	(000,000)
2007 Actual GM (Net Loss)	\$ (468)
Potential After-tax Interest Savings (Question Debt #7)	451
Potential After-tax Operating Savings (Question Operations #15)	9,074
Pro-forma 2007 GM Net Income	\$9,057

Category #3: Labor Unions and Bankruptcy

1. What union contract provisions and industry conditions provide an unusual burden to the company and potentially give it a competitive disadvantage to international competition?

Based on the body of the case, there are a number of suggestions that students might make, including: (1) current and legacy retirement costs, (2) current and legacy health care costs (3) jobs bank costs, (4) management compensation. However, students must be able to justify and prioritize their choices/suggestions.

Key Concepts to be discussed: Job security, nationalized health care, bankruptcy, American cultural issues especially regarding health care, worker "non-work" compensation, management compensation, comparison of automobile industry compensation with other industries'.

2. What union concessions, management concessions, and government interventions are most important to the industry and how should they be prioritized? If you were management, what union concessions would you ask for and how would you prioritize them?

There are a number of acceptable solutions to these questions. It is important that students identify the potential concessions and interventions.

Union concessions include: pay and benefit reductions, shift of health care costs to a VEBA, discontinuation of jobs bank, elimination or capping of legacy costs.

Management concessions include: limitations on CEO compensation, increased union ownership and control of company stock, union membership on board of directions.

Government interventions include: nationalized health care plan, government infusions of capital, laws limiting union power, laws reducing company responsibility for legacy costs.

There are no right and wrong answers to the actual prioritization suggested by students. However, students must be able to justify why unions might prioritize benefits in one manner while management might prioritize in a different manner.

Key concepts to be discussed: Job security, equity and fairness, comparison of competitor's benefits to American automakers', comparison of management's benefits to unions, corporate governance.

3. Is the Jobs Bank important? What might happen if the jobs bank is discontinued? As a manager, what are your recommendations for change and/or alternative solution?

Students may not be aware that the United Auto Workers union ended its so-call jobs bank for General Motors Corp. employees on February 2, 2009 (Ramsey & Green, 2009). However, students should discuss their perspectives regarding the jobs bank program making recommendations for continuation, change and/or alternative solutions.

Key concepts to be discussed: Payment for non-working employees especially during layoffs.

4. As a manager, what are your recommendations for change and/or alternative solution to legacy costs?

Students might recommend shifting liability for health care coverage to a VEBA. However, there is an obvious problem with this solution in that a VEBA must be funded (normally by the company) with sufficient cash and other assets to provide lifetime solvency. The company, on the cusp of bankruptcy, could likely not afford to fully fund a VEBA.

Another suggestion might be to shut down plants. However, doing so does not provide relief from all plant related costs. Under union agreements, companies must continue to pay labor costs and benefits even if the labor is not utilized.

Key concepts to be discussed: Legacy costs, ethical obligations to present and past employees, organizational responsibility to sufficiently fund legacy costs.

5. Is there a moral/ethical obligation to maintain health care and insurance for retired workers? When is the moral obligation overridden by the possible bankruptcy of the company?

Students may have a number of perceptions and responses regarding corporate social responsibility and obligation to its workers.

Key concepts to be discussed: Organizational social obligation, trust, employee dependency, corporate social responsibility, American cultural norms, stakeholder responsibility including community.

6. As managers, what method of persuasion would you use (arguments/negotiations) to convince union representatives to make needed concessions? If the union refuses to concede, what could management do?

Management could pressure unions by seeking legislative support to pass laws limiting union power. Legislation could also be passed which would allow companies to avoid funding benefit obligations related to prior year employees' service (legacy costs).

Management could threaten to file for bankruptcy. In bankruptcy proceedings, the company could seek to avoid payment of obligations (such as legacy costs) and could seek to set aside current union contracts.

Management could threaten to close down plants or move work overseas or to Canada where labor and benefit costs are less.

Key concepts to be discussed: Invoking public pressure during union negotiations.

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Exhibit #1 (Solution)

United Airlines			
Income Statement			
For Years ended Decemb	per 31, 2002 and 2007		
(\$000,0	000)	-	
	2002	2007	
Revenue	13,916	20,143	
Cost of Sales (Non Fuel)	15,007	14,103	
Fuel	1,921	5,003	
EBIT	-3,012	1,037	
Interest Expense	601	661	
Income Taxes	0	297	
Other	286	324	
Net Income	-3,327	403	
Passenger Miles (000,000)	109,460	117,399	
EBIT Per Mile	-\$0.0275	\$0.0088	
Total Cost Per Mile	\$0.1547	\$0.1627	
Fuel Cost Per Mile	\$0.0175	\$0.0426	
NonFuel Cost Per Mile	\$0.1371	\$0.1201	

Exhibit #3 (Solution)

General Motors			
Income Statement			
For Years ended Decer	For Years ended December 31, 2002 and 2007		
(\$000,000 Except	Per Car Amounts)		
	2002	2007	
Revenue	186,763	181,122	
Cost of Sales	153,344	166,259	
SG&A and Other Expense	23,624	19,253	
EBIT	9,795	-4,390	
Interest Expense	7,715	2,902	
Income Taxes	533	37,162	

General Motors		
	Income Statement	
For Years end	ded December 31, 2002 and 2007	
(\$000,00	00 Except Per Car Amounts)	
	2002	2007
Other	142	5,722
Net Income	1,689	-38,732
Vehicles Sold	8,525,000	9,370,000
EBIT Per Vehicle	1,028	-468
SG&A Per Vehicle	2,771	2,055
Cost of Sales Per Vehicle	17,988	17,744
Total Cost Per Vehicle	20,759	19,799

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STEVE JOBS AND APPLE, INC.

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CASE DESCRIPTION

The primary issues in this case involve business startup and management, and are appropriate for entrepreneurship and management courses. A secondary issue demonstrates how personal drive and motivation are critical components of successfully managing and growing a business, thereby making this case appropriate for discussion on the topic of strategic management. The case chronicles the life and passion of entrepreneur, Steve Jobs – illustrating the rise, fall, and current state of the Apple Computer Company. The case has a difficulty level 2 and is designed to be covered within one (75 minute) class period. The required preparation time is about 2 hours. It is appropriate for small business, entrepreneurship, or management classes. The purpose of this case is to illustrate to students how individual passion, determination, and innovation is a critical element in business start up success and also to stimulate critical thinking in terms of future direction for a company in a struggling economy.

CASE SYNOPSIS

The Apple Computer Company is arguably one of the most innovative technology companies to emerge in the last three decades. Apple, Inc. is responsible for bringing to market such products as the Macintosh computer and laptop, iPod and iTunes, and most recently, the iPhone. The success of the company can be traced primarily to a single individual - founder, Steven Jobs. Jobs and his friend, Steve Wozniak founded and built Apple into a 32 billion dollar company. The company enjoyed much success during the past decade with its stock price hitting a high of \$200 in 2007. More recently, the stock has retreated to around \$90 causing a massive decline in shareholder wealth. Today, Apple CEO Steve Jobs is faced with the challenge of resurrecting his once dominant company in light of weak economic conditions and sub-par personal health. The case chronicles the life of Steve Jobs, the rise of Apple, Inc. and his personal challenges as CEO of the company to continue to provide innovative products to a marketplace of technology avid consumers.

INSTRUCTORS' NOTES

Case Overview and Recommendations for Teaching Approaches

Students will find the case very interesting as most of them will have used one of Apple's products. Students will combine the facts presented in the case with their own perceptions and experiences with Apple's products to answer the discussion questions. The case makes valuable contributions related to the historical background of one of the most successful companies in the world and consistently voted the most innovative company. Furthermore, the case examines the psychology of an entrepreneur, Steve Jobs, and takes the student through the entrepreneurial process of starting Apple along with Steve Wozniak. A unique aspect of this case is that Apple products are so ubiquitous that most students will have experienced the technological innovativeness of the company through personal ownership of an iPod, iPhone, or Apple computer product (MAC or laptop). This aspect should make the case both relevant and interesting to students. The following questions are recommended for discussion.

DISCUSSION QUESTIONS WITH SUGGESTED ANSWERS

1. Discuss the attributes that contribute to the success of Steve Jobs.

Students should draw from facts presented in the case highlighting various attributes that could be argued to be related to his success. Evidence of this may include the following:

Passion -

Job's introduction to the world of electronics came during High School with the discovery of electronic hobby kits. He realized that the electric world was not as complicated as it first seemed and that electronics was an interesting field. It quickly became his passion. He began attending lectures conducted by the Hewlett Packard Company (HP) and audited classes at Reed College. This further fueled his appetite for the field and eventually he found summer employment at HP.

Jobs (and Wozniak) attended meetings of the Homebrew Computer Club. The club consisted of other electronics enthusiasts who presented news of new innovations in the electronics world and discussed updates of the progressions made by members in creating their own computers.

Intelligence and Confidence -

Early on, he found school to be so easy that he was able to skip 5th grade and move directly into Middle School. Later, while working at his job at Atari, some of his fellow workers viewed him as arrogant and overly confident. Although, this was not necessarily an attribute conducive to a collegial work environment, it did provide Jobs the opportunity to work the night shift where it was easier for him to befriend Steve Wozniak who assisted Jobs with the technical aspects of his work. Others described Jobs as "referring to most people as bozos". Although this was a condescending way of viewing his future customers, it did serve to ensure that Apple products were developed in a user-friendly and understandable manner.

Resourcefulness -

Atari invited Jobs to develop the circuitry that would transform the popular game, Pong into something more innovative (Breakout), however he was given only four days to complete the task. Realizing that this project was beyond his capabilities, he contacted his friend, Steve Wozniak who helped him accomplish the task. This event, turned out to be the motivation for starting the Apple Computer Company.

Visionary and Opportunistic -

Jobs recognized an opportunity to pitch a working model (developed by Wozniak) of a computer that could be viewed on a TV (as opposed to a costly monitor) to HP and Atari. Although neither company chose to invest in the production and marketing, Jobs persuaded Wozniak that this creation was good enough that they should try to produce and market the computer on their own. They raised \$1,750 to begin this venture, which turned out to be the start of the Apple Computer Company (Young and Simon, 2005).

After leaving Apple in 1986, Jobs bought the majority share of a puttering computer graphics company, called Pixar, for \$10 million from George Lucas. Lucas, the famed creator of the *Star Wars* movies, was looking to sell of some of his assets to fund his divorce. Jobs saw a lot of opportunity in Pixar and led the company to produce animated commercials for some leading brands (Tropicana, Life Savers and Listerine were some of the first brands to contract Pixar to produce commercials). Later, Disney agreed to a new five film agreement leading to box office mega-hits such as *Toy Story* (I & II), *A Bug's Life, Cars*, and *The Incredibles* (Linzmayer, 2004).

Jobs' vision to see the potential in technology allowed him to take full advantage of these opportunities. Without Jobs' vision he could not have seen the potential in the first computer that Wozniak built or other companies that he was involved in running.

With the introduction of such innovative products such as the iPod, iTunes, and iPhone, Jobs demonstrated the vision to understand how consumers would find communication and entertainment devices convenient, cost effective, and cutting edge.

Driven and Hard Working -

Jobs, from a very young age, had a tireless work ethic, particularly toward his passion and electrical engineering. His work ethic was the motivation that led him to learn about the advanced technical knowledge of the inner workings of the computers that Apple has been building for decades.

Upon being removed from Apple in 1985, Jobs immediately founded another computer company, NeXT. In 1996, Apple bought NeXT and asked Jobs to return to Apple as interim CEO. He became the permanent CEO in 2000 and currently still holds that position.

Job's drive for perfection sometimes had a negative effect on the people he worked with. According to Alan Deutschman (2000), Jobs was described as a "control freak", "egomaniac", and "fearsome tyrant". Kahney (2008) also writes about Steve Jobs as frequently turning from a charismatic leader to an "ego and emotion destroying tyrant."

Willingness to take Risks -

Jobs demonstrated his willing to take a risk early on by selling his Volkswagen van for startup capital for Apple. Later, he invested capital to start new companies (like NeXT) and existing companies like Pixar. Although all of his risks were not rewarded (e.g., NeXT was ultimately dissolved), he was able benefit from his investment and effort to make Pixar a success.

Charismatic and Persuasive -

Job is described as having great skills at persuasiveness and salesmanship and is reported to be highly charismatic. Early on, he was able to convince his friend, Steve Wozniak, to start up the Apple Computer Company.

Later, people in the film industry felt that the deal between Pixar and Disney was made possible because of the charisma, confidence and negotiating talents of Jobs. Pixar executive Ed Catmull said *"It took somebody of Job's stature to get us a parity deal with Disney"* (Linzmayer, 2004). Former Pixar Marketing Director Pamela Kerwin said *"He had the brains, energy, and chutzpah to protect Pixar's interest. He enabled us to negotiate as equals"* (Linzmayer, 2004). Jobs investment and financing of Pixar was rewarded handsomely. Through his investment he was awarded 30 million shares of Pixar worth around \$1 billion.

<u>High Need for Achievement –</u>

Upon leaving Apple in 1985, Jobs immediately founded a new computer company (NeXT) and later grew animation film company (Pixar). Upon his return to Apple, he aspired to make Apple a leader in the information technology industry. Through innovation leadership, he was able to set trends in productivity, entertainment, and communication products. He attributes the sustaining qualities of his energetic and entrepreneurial leadership to being able to work at the things he loves to achieve his goals.

2. Discuss the attributes that contribute to the success Steve Wozniak.

Students should draw from facts presented in the case highlighting various attributes that could be argued to be related to his success. Evidence of this may include the following:

Passion -

Steve Wozniak's passion for electronics stemmed from his father's career as an engineer at Lockheed Martin (Wozniak, 2006). Wozniak formally studied electrical engineering at the University of Colorado at Boulder and De Anza College. Upon withdrawing from college, he began building computers with a friend. To help fund his interest in building computers, Wozniak designed, built, and sold (illegal) phone calling devises to students in dorms and door-to-door for \$150.

Wozniak was enthusiastic to help his friend, Steve Jobs develop the circuitry that would transform the popular game, Pong into something more innovative (Breakout) in an accelerated timeframe of only four days. Although he was paid a share of the \$700, to Wozniak the real compensation was the sense of accomplishment and excitement realized by completing the task. Looking back on this experience Wozniak claims, "*I would have done it for a quarter*" (Linzmayer, 2004).

Wozniak (and Jobs) attended meetings of the Homebrew Computer Club. The club consisted of other electronics enthusiasts who presented news of new innovations in the electronics world and discussed updates of the progressions made by members in creating their own computers. During one of these meetings Wozniak presented an apparent working model of a computer that could be viewed on a television set, as opposed to a costly monitor.

Intrinsic Motivation and Pride in Work -

Wozniak was very proud of his work. His accomplishments created all the gratification that he desired. Jobs, on the other hand, had a vision and a plan for this innovation created by Wozniak. Jobs envisioned exchanging the blue print for Wozniak's computer for cash, as opposed to showing them off for bragging rights. Wozniak was never motivated by the money. The idea of making money off of his passion never did not drive Wozniak to create his computer nor did he envision selling it after it was complete. Only after Jobs convinced Wozniak that his creation was good enough to sell did the two decide to produce and market the computer on their own.

3. Is Steve Jobs an entrepreneur? Is Steve Wozniak an entrepreneur? If not, what are they?

Students should draw from facts presented in the case to distinguish between characteristics defining of an *entrepreneur* versus an *inventor*.

Jobs is without a doubt a driven entrepreneur. Many of the characteristics from the first question are defining entrepreneurial traits. He has the ability to find opportunity and gather resources to take advantage of opportunities (e.g., having Wozniak develop the new Breakout circuitry for him). He is driven, works hard, and has a high need for achievement. He is willing to take risks (first exemplified by selling his Volkswagen van for start-up capital).

Wozniak, on the other hand, is an inventor. He makes no claims about producing or wanting to make money off of his inventions. He does these things for fun and passion. Without Jobs vision and passion, Apple would never have existed as Wozniak did not have the entrepreneurial instincts to create a company and make money.

4. What did Steve Jobs do to make Apple Inc. so successful? What grade would you give him as an entrepreneur?

Students should draw from facts presented in the case highlighting various attributes that could be argued to be related to his success. Evidence of this may include the following:

According to Jobs, the reason why his companies have become so successful is because they hire the very best people. While this strategy is definitely a huge part of the success of Jobs and Apple, it definitely is not the only reason. Jobs, from a very young age, had a tireless work ethic, particularly toward his passion, electrical engineering. His work ethic was the motivation that led him to learn about the advanced technical knowledge of the inner workings of the computers that Apple has been building for decades.

Jobs' vision to see the potential in technology allowed him to take full advantage of these opportunities. Without his vision he could not have seen the potential in the first computer that Wozniak built. Eventually Jobs envisioned a revolutionary process that involved a unique bond

between the world and computers. His understanding of human behavior and motivation helped him to accurately speculate what people will see as revolutionary and desirable products.

He is very persuasive and has advanced negotiation skills. This was demonstrated while he was running Pixar and negotiating terms with Disney on production of their animated films.

Jobs also made Apple successful because of his business and social foresight and because of his love of the products his company creates. A good salesman believes in his products and espouses them with high enthusiasm. Jobs believed in his technological innovations and sold them aggressively throughout his career. His ability to develop and deliver superior business strategy has kept Apple in the forefront of the industry.

Steve Jobs deserves an A for his ability to build the most innovative company in the world. Apple is constantly innovating with former and current products like the Mac I, Mac II, Mac III, Lisa, Macintosh, MacBook, iPod, iPhone, etc. Unfortunately, Job's volatile personality could be argued to drop his overall grade down to an A-.

5. How do you as a consumer of Apple Inc. products view the company? How do you view the products that they sell? How are these views the same or different relative to how you perceive other product from other technology companies (e.g., Dell, Sony, Microsoft)?

For this question, students will draw mainly from their personal experiences. Most students will have either owned or used an iPod and downloaded music from iTunes. Some students will own a Mac laptop. Few may own or may have used the new iPhone. For comparison, students may have a MP3 player from a competing company (e.g., ScanDisk, Sony, Samsung). Rival PC or laptops may include Dell, HP, Acer (mini laptops). Competitors to the iPhone are Blackberry, Palm, LG, Nokia (among others). As a suggestion for facilitating in-class discussion, the following table could be filled out as students volunteer answers:

Apple Products	Comparable Product (Other Companies)	Which Prefer / Why
iPod	ScanDisk Sansa, Microsoft Zune, Sony Walkman, Samsung, etc.	Size, price, capacity, easy to use, considered cool/stylish, etc.
iTunes	Napster, Rhapsody, etc.	Price of a song/album, compatibility with MP3 player(s), selection, etc.
iPhone	Blackberry, Palm, LG, Nokia, Samsung, etc.	Functionality, prince, ease of use, stylish, features, etc.
Laptop	Dell, Acer, Sony, HP, etc.	Size, capacity, features, price, etc.

The most interesting point of this discussion may be which products students prefer and why. Answers will include physical or tangible attributes such as: size, price, storage/memory capacity, compatibility, style, color etc. Other (more interesting answers) may include the emotional or intangible aspects of the product/company such as: ease of use, use of product that is considered "cool" or mainstream, feelings of "fitting in" or being on the cutting edge of technology. The reasons

provided for this latter category (of intangibles) are harder for companies to replicate and could be the basis for a competitive advantage. For example, any company can produce an MP3 player that is competitive priced with ample storage and conveniently sized. Only a single company will win the favored perception of the consumer as being cutting edge, easy to use, innovative, and the coveted tile of being "cool".

6. What were the major problems and/or opportunities facing Apple, Inc. in 2008 and what recommendations would you make to Steve Jobs? Why?

Students should draw from facts presented in the case to identify potential problems and opportunities. Evidence of this may include the following:

Apple was facing the worst economic environment since the Great Depression. The current critical opportunities facing Apple are the continuation of product innovation and growth of existing products into new markets and the integration of existing products with new products. The modularity of its operating system enables it to function in new and existing products that allow Apple to move into new areas of technology beyond computers.

In order to increase its profitability and market share Apple must have products that the consumers want to purchase. Apple must have cutting edge, technological products that make a person's life simpler that can be purchased at a reasonable price. This strategy meshes with Apple's past practices. Critical success factors for Apple include: innovation, flexible operating system, visionary foresight, cost management, and competitive pricing.

There is a temptation to list the "Apple culture" that Apple's PC customers have created as a critical success factor; however, it is a double-edged sword. To some, Apple may be viewed as a superior product for only desk top publishing and creative arts applications. This view serves to force Apple into a niche that has potentially limited its sales. Apple has yet to shed that image for its personal computer products. However, with the advent of enhanced server capabilities, the Apple computer is beginning to broaden its image.

In the light of the recent financial success and technological diversification, Apple has created a springboard for its products. For example, they have recently gained public favor with respect to improvements in the iPod and iPhone. During a June 8, 2009 world wide developer's conference, Apple announced size and price improvements of the new Apple iPhone. Furthermore, according to Microsoft, the Office 2008 for Mac is the hottest selling version of the productivity suite in nearly 20 years. Apple must do everything it can to continue this wave of popularity.

Apple did commit some marketing mistakes with the release of the iPhone in 2007. The initial high price and commitment to only one phone service carrier may have harmed sales. Apple must leverage its new public awareness and continue to market and to innovate. Innovation is their true core competency along with another critical success factor, its operating system. To maintain industry leadership, Jobs must continue to innovate. Apple should continue to add or improve features on its products and develop new uses with which to apply its operating system.

A differing approach to innovation could take the form of "green products." Apple has made efforts to improve some of its components so to provide cleaner energy use. Its efforts to place solar

power in portable devices can dramatically extend the lives of the batteries, making the devices less expensive to own and better for the environment. Another avenue for green improvement could be its shipping and packaging containers – to take advantage of their "Green Apple" concept.

Jobs and Apple must also continue to negotiate partnerships with other technology companies. A good example is AppleTV where they should leverage relationships with entertainment providers in the most cost effective way. In addition, Apple's competitors are currently making deals with Intel and other microprocessor manufacturers. Apple could position themselves strategically by leveraging long-term contracts with the best suppliers and materials companies. Should any of Apple's strategies for future growth not be sustainable, they would have to operate as in a mature industry, by emphasizing better cost and service and move further into overseas markets.

If fortune prevails, technology will continue to be ever-evolving and Apple will be able to continue its success. With its powerful culture of entrepreneurship and innovation, Apple has the financial health and tools to boost it into a future with superior products and marketing.

EPILOGUE

As of January 2009, Jobs announced that his illness was more complicated than he thought and he was taking a leave of absence until June 2009. During a June 8, 2009 world wide developer's conference, where the company announced size and price improvements of the new Apple iPhone, CEO Steve Jobs was noticeably absent. Tim Cook is now in charge of Apple and rumors are abundant about the future of Apple without Jobs. Some say that without the long-term vision of jobs they will never be the same. *"Steve is terrific at attracting and retaining people, creating an agenda and getting people to stick to it,"* said Stephen G. Perlman, a Silicon Valley entrepreneur who was a principal scientist at Apple in the 1980s. *"It's very hard to find somebody who is so credible, and who has such a strong following that he is able to cut through corporate politics"* (Stone 2005).

The questions about Apple's future remain uncertain. The company has enough products in their pipeline to withstand the next 5 years, but what about 10-20 years? What will happen to Apple? The last time Jobs left for a long period the stock price dropped to \$2 a share. On the day they announced his complications and temporary resignation, the stock price dropped to \$83.00. Despite what happens to Jobs the company needs strong leadership to move forward. The future will remain interesting for one of the best companies in the world.

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eCAMPUS: SUCCESS! NOW WHAT?

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CASE DESCRIPTION

This case concerns the strategic management of an e-commerce business and its stages of growth. The case has a difficulty level of four, appropriate for senior level classes or higher. It can be taught in two hours of class time, with students spending six to twelve hours of outside preparation. At the request of the company, this case does not contain any detailed financial data or financial strategy.

CASE SYNOPSIS

eCampus.com is an Internet retailer of college textbooks that has resurrected itself from bankruptcy into a profitable business. The company was created near the end of the "dot.com bubble" using the typical dot com start-up business model of that time. Success came quickly for the new company due to a twenty million dollar media campaign and highly creative TV commercials that ran on three cable TV networks in August and September of 1999. The eCampus Web site quickly became one of the twenty busiest sites on the Internet. More importantly, eCampus achieved a phenomenal visitor-to-buyer conversion rate of 14%. It looked like eCampus was going to be a big success.

The "dot.com" bubble burst in March 2000 and the personal financial problems of the majority investor resulted in the company being forced into bankruptcy in June 2000. The company continued operating under Chapter 11 bankruptcy until it was sold at public auction in 2003. The new owners undertook a competitive strategy based on operating and marketing efficiency. While the process of reviving the company has been a slow and bumpy process, the company has grown, stabilized and matured.

Now, the management is turning its attention to the new competitive threats from existing rivals, lowcost imported textbooks and emerging electronic textbook publishers. Federal and state governments are pressuring higher education institutions, bookstore and publishing companies to find ways to lower textbook costs for students. Consumer groups have organized to provide low-cost or free textbooks to students in some states. New companies, such as Flat World Knowledge and Chegg, have entered the industry using a business model based on innovative use of technology that threatens to disrupt the current textbook industry. Students must analyze these competitive threats and decide what eCampus should do to survive in a highly competitive industry

INSTRUCTORS' NOTES

Discussion Questions

A. Analysis

1. Review the mission of eCampus and its competitors. Which competitor or competitors pose the greatest threat?

Mission Statement-

Our mission is to provide the easiest, fastest, cheapest way for college and university students to buy textbooks and stuff. We think the Internet ought to be fun and that shopping for textbooks should be as fast and convenient as shopping for anything else on the Internet. We are making a personal commitment to every customer that eCampus.com will be the best source for everything they need.

What We Do

eCampus.com is an educational resource provider of new and used textbooks, trade books, college emblematic and Greek apparel for men and women, electronics, computers, gifts and other services traditionally associated with the college experience. The company's Internet storefront is fully integrated with its state-of-the-art distribution facility and offers the largest in-stock selections of new and used textbooks available online. The innovative, multi-award-winning company has created technology to market products and services to a variety of educational, corporate, and online content providers.

An organization's mission defines its purpose or reason for existence. Throughout its short, and sometimes turbulent, history eCampus has stayed true to its original mission. It has continued to provide students with a fast, easy, and relatively cheap way to purchase textbooks.

However, the management vision has change dramatically. To Wilkinson, creating a successful e-commerce company that would go public in one year was a way to solve his personal cash flow problems. Most of the original top management also viewed eCampus as a cash cow that would them wealthy when it hit the IPO market.

While the company mission has remained the same, the new owners' vision seems different. They have scaled back their expectations of quick wealth to focus on slower, sustainable growth, efficiency, average profits, and expanding into new market segments.

2. Develop an industry analysis for eCampus.

Students should base their answers on Porter, Michael E. (Competitive Strategy: Techniques for Analyzing Industries and Competitors, 1980 or 1998).

The economy has seen significant shifts since eCampus was launched. The readily available capital for e-commerce ventures virtually dried up as the IPO bubble burst and venture capital firms
got burned. The downward trend in the economy after 2000 resulted in increasing college enrolments, but a decline in the purchasing of new textbooks. The rapid increases in textbook prices due to the addition of associated CDs and ancillary websites to textbooks have met stiff resistance in the market by both students and professors. The price increases have been so sharp that state legislators are starting to look into this issue. Students can purchase the same texts sold in North America from off-shore sources for half the list price of new hardback books. This fact has also caused concern among lawmakers.

Textbook e-tailing has not taken off as it was predicted. Students want to make sure they are getting the right material for their courses. Web-based companies have not established the same rapport with professors that campus bookstores have. Consequently, e-tailers do not have complete course packets available for students, only books. In addition, traditional campus bookstores are developing their own websites that give students the convenience of 24-hour service.

Technology is constantly changing. Electronic ancillary material and website development is driving up the cost of textbooks. Consequently, some publishers are offering streamlined or customized versions of textbooks for less cost. Publishers are exploring electronic publishing as a way to increase convenience and quality while holding down costs. However, this type of media has yet to catch on in the market. As supply chain management innovates and evolves, there is always the possibility that entire distribution system for textbooks will be radically changed.

3. Have the students discuss the SWOT analysis for eCampus.

Student could be directed to the following Web site for explanation and example for performing a SWOT analysis. (SWOT Analysis: Lesson)

eCampus lost some of its major strengths because of the bankruptcy. It has lost the majority of its talented personnel and the most of its capitalization. On the other hand, it has streamlined it operations so that it has become much more cost effective, created a cost effective promotion program, and upgraded its information system capabilities. It has maintained the momentum, visibility, its user-friendly Web site, efficient warehousing system, and rebuilt relations with its suppliers created before the bankruptcy. The downsizing has helped it stabilize the somewhat chaotic organizational environment and improve the general level of job satisfaction among its employees. While the cost-cutting measures have increased productivity and kept the company alive, eCampus' reputation, image, expertise and cutting-edge operational knowledge is no enough to insure its survival. Its relatively small capital base puts in a tenuous position when competing with Wal-Mart, Amazon.com, Barnes & Nobel, Follett and other major competitors.

There are still opportunities for eCampus, despite being handicapped by the lack of capitalization. It can, and is, trying to expand its year round line of traditional collegiate merchandise. It could expand into other lines of Web-based services for students. eCampus should begin to look for other organizations to develop strategic joint ventures or alliances that c strengthen its competitive position. The major threat hanging over eCampus is that fact that it might never achieve above average returns. Students are using the Internet as an alternative source for textbooks, but not in the numbers that were anticipated. As the market and technology evolve, eCampus may not have the capitalization to make the necessary changes to compete with the larger companies that have deeper

pockets. At some point, disintermediation may reach the publishing companies and textbook authors increasingly sell ebooks and ancillaries directly to students. In addition, there is the possibility that that the industry will evolve to the point where entire texts of parts of the texts can be download from a publisher's site.

4. Develop a five forces analysis for eCampus.

Student should use the Five Forces model to form their answers. See Figure 1. (Porter (1998, 1985, 1980)

Figure 1: The *Five Factors or Forces Affecting Competition in an Industry.* Based on a diagram appearing on page 4 of *Competitive Strategy* by Michael Porter. Free Press (1980).



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eCampus competes with thousands of independent online retail booksellers and several large chains like Barnes & Nobel, VarsityBooks, and Follett. Barnes & Nobel, Follett, and VarsityBooks, are using their resources and experience to strengthen their online presence. In addition, Amazon.com has become a major player in the market with very little effort or expense, and Wal-Mart recently also entered the market.

Although there is no substitute for a required textbook, there are many alternative for buying textbooks. Brick-and-mortar companies do not offer the convenience of being open 24/7. However, they are likely to have a physical inventory on hand so students do not have to wait for their texts, and they can physically inspect the book before buying it.

Entry barriers are contingent on the scope of operations. It is relatively easy to start an independent bookstore or establish an on-line company. However becoming a major competitor requires large amounts of start-up capital to take on established companies. eCampus was able to attract this type initial funding but went through it very quickly.

Suppliers have a great deal of bargaining power in the industry. The overall well being of the textbook resellers is directly related to the publishers. Because of their bargaining power, publishers are able to squeeze a larger share of profitability out of the marketing channel than their value added might warrant. Large resellers might be able to negotiate volume discounts; however, publishers pretty well set the market price. If resellers discount books to students, they have to reduce either their operational costs or absorb the margins.

Consumers have relatively little bargaining power. Before the introduction of Internet sellers, students had little opportunity for comparison shop. They were practically a captive market. As more textbook outlets appear on the Web, their bargaining power will grow.

5. Discuss the resources, capabilities, and core competencies of eCampus before and after the bankruptcy.

Firms have both tangible and intangible resources. Tangible resources include financial, physical, technological (hardware, software, networks), and organizational resources. Intangible resources include human knowledge and skills, creativity, and company image.

Before the bankruptcy, eCampus had a huge amount of equity capital and borrowing capacity, cutting-edge technology, state of the art facilities, and a corporate culture that provided an exciting and innovative work environment. It was able to recruit and create a management team with years of experience in e-commerce, and new and used textbook distribution. It created a strong brand name through its advertising, evidenced by setting a one-day record for the number of hits (i.e., unique visitors) received by a commercial web site in August 1999. Just before going bankrupt, eCampus had serious cash flow problems, and declining morale and trust among its employees. The bankruptcy caused eCampus to lose its equity capital, its ability to raise more capital, and tarnished its image. At the beginning of the recovery phase, the information system was converted to a less expensive computer platform and the custom software was rewritten to enhance performance. eCampus still had its state-of-the-art distribution center. Most of the top management team was gone and was not replaced, and IT staff was reduced from thirty to three.

A firm's capabilities are its ability to combine and employ both its tangible and intangible resources into outputs. The interactions among the resources are often complex and give the organization its competitive edge. Capabilities extend across all functional areas.

Prior to bankruptcy, eCampus had developed highly motivated teams that often worked long workweeks, sometimes working as much as 100 hours in one week when necessary. Top management was able to create and launch a Web-based textbook reseller based on a new business model in only seven months. The outsourced advertising campaign created such a great traffic volume to its website that it crashed eCampus' Web site. The possibility of participating in the initial public offering (IPO) of eCampus stock enabled eCampus to recruit and retain outstanding employees. The management team had extensive knowledge of the textbook market. The state-of-the-art distribution facility, long-standing working relationships with textbook publishing companies and a strong used textbook supply chain were its most valuable resources.

Eight months after going online, the emergent company had lost almost all of its original management team and technical personnel. The organization structure became less complex and simpler to operate and programming was outsourced to a company in Bangalore, India. However, they retained the state-of-the-art distribution system that produced an almost error free shipping system, stable if somewhat tarnished image with publishers, a strong used textbook supply chain, and an improved front end operation that could handle all hits during the busy season without crashing. eCampus has developed a way to create extensive exposure at extremely low cost via the Web that targets students looking surfing the Internet for textbooks.

The core competencies a business include the combination of resources and capabilities that give one company a competitive advantage over another company. Core competencies emerge over time to create unique value for a firm's products and services. However, the combination of a firm's resources and its capabilities do not always translate into a core competency. In order to create a sustainable advantage, capabilities must be either valuable (enable it exploit opportunities and neutralize weaknesses), rare (possessed by few competitors), costly to imitate (capabilities cannot be developed easily), or non-substitutable (do not have equivalents).

If the IPO bubble had not burst, eCampus might have been able to maintain their original business model and created core competencies that might have given it a significant advantage over its competitors. As it now stands, eCampus has lost its funding advantage and experienced personnel. The now leaner company may eventually develop core competencies, however it does not meet any of the four criteria for creating a sustainable competitive advantage. At this point, the instructor might want to discuss eCampus' current resources, capabilities, and core competencies, if any.

B. Formulation

1. What generic corporate strategies has eCampus pursued?

eCampus launch stage was so successful that they became a poster company for Internet firms. In their first month on Web, they ranked twentieth in the most hits of all dot.coms. Even more astounding was their 14% conversion rate, compared to an average conversion rate of 1-2% for dot.coms. The vast financial resources eCampus had for advertising, promotions, salaries, etc. seemed

endless. However, when Wallace Wilkinson's personal financial problems became public knowledge, funding quickly dried up, and eCampus went into a retrenchment strategy by declaring bankruptcy. The emergent strategy is once again growth, but at a much slower and controlled rate.

2. What competitive strategies does eCampus employ?

eCampus employs several strategies. They include: cost leadership, differentiation, and focus (niche) strategies, and there is some evidence of moving toward a category killer model by providing an array of product and services related to textbooks and education. eCampus offers a wider variety of products and services than its rivals (e.g., eFollett, etc.).

The cost leadership strategy focuses on delivering goods or services to customers at the lowest costs, relative to competitors. A differentiation strategy provides value to its customers by being different, such as higher quality or better service. The focused strategy creates value by serving a specific type of customer.

The answer to this question depends on how the scope of the market is viewed. If the industry is viewed as the entire book reseller market or the entire textbook market, eCampus' strategy could be viewed as a focused/differentiated strategy. If the industry is limited to the college textbook market, it could be viewed as a differentiated strategy. As a Web-based company, they certainly have initiated a different strategic model to create value for their customers. eCampus promotes itself as a company that can sell books for less money and less hassle.

After bankruptcy, they still pursue the same value propositions through major cost reductions in their operations. This is not a low-cost strategy, however. While they are productive and cost efficient and their technology and operations are easy to imitate, any advantage that they might gain will be temporary. Companies like Amazon.com, Barnes and Nobel, and Wal-Mart have the advantages of scale and can spread costs over a much higher sales volume. They also have the resources to make huge capital investments in supply chain technology to reduce their costs further.

3. Has the eCampus entrepreneurial strategy been successful?

To be successful, a new venture requires: (1) a viable opportunity, (2) sufficient resources, and (3) and a skilled entrepreneurial team. At the entry stage, creating new ways to meet the consumers' needs is considered a pioneering strategy. A pioneering strategy is disruptive to the industry. If the consumers accept it, the established firms in the industry will rush to copy the new business model. At the start-up stage, Campus certainly had a viable opportunity, a skilled entrepreneurial team, and sufficient resources.

eCampus followed the Resource-Based model. The Resource-Based model assumes that a firm's success is primarily due to a unique set of resources and capabilities, rather than industry structural characteristics. Firms that achieve competitive advantage produce above average returns in the industry. However, gaining a sustainable competitive advantage is rare and hard to duplicate. In the beginning, eCampus developed a unique alliance with WCT, acquired state of the art computer equipment and industry experienced and e-commerce personnel, created a distinctive organization by combining elements of successful e-tailers with the established culture and policies of the WCT

Bookstore, and implemented a highly successful promotional campaign. This was the new pure play business model better than those of its competitors.

The emergent company has undergone substantial changes in its resource base. Because the capitalization underwent a massive reduction in funds, it had to learn how to operate much more efficiently. Both overhead and operational cost drastically reduced while maintaining a similar level of service. The firm now has a bare-bones management staff and outsources its technical functions. This has enabled them to move all of their administrative offices to warehousing site eliminating further cost and improving the level interaction and cooperation between departments. New equipment has been attained improving operational performance and cost. Their unique way of promoting the company has all but eliminated the cost of promotion.

The business model is no longer a pure play or pioneering strategy, but a blend of its original pioneering strategy and its imitation of other entrepreneurial e-tailing strategies. It is now somewhere between a pure innovative strategy and a pure imitative strategy, which means it has moved to an adaptive strategy. It has been taking existing technology and processes and using them in new and innovative ways to create value for its customers and alliances. To remain viable, eCampus will have to keep innovating until they create an advantage that is once again hard to duplicate or imitate.

C. Implementation

1. How has the organization structure of eCampus changed during its life?

You might want to have your students investigate how structure changes throughout the growth cycle by comparing organic to mechanistic organizations and how the Internet and technology is giving rise to newer forms of structures.

In general, structure does follow strategy, but as structures become entrenched, they are slow to change and end up influencing strategy. In the case of eCampus the pre-bankruptcy organization was consistent other start-up companies. Initially they went through the launch and growth stages at blinding speed. During these stages, they tended to be organic in nature with few rules and policies. eCampus used teams and had a great deal of cross communication, few vertical levels, and the culture was chaotic. The personnel were highly motivated and empowered. At this time they were burning through money, there was very little cost control, and they were not only profitless they went bankrupt.

The emergent organization went through a re-engineering phases in which processes were reviewed, modified and outsourced which resulted in major cost reductions. During this phase, there were major reductions in personnel, programming was outsourced, and advertising retargeted. The company made the transition from the start-up stage to the slow growth stage. It still maintains an organic team structure with few management levels and few formal rules. It is now follows a more organized and prudent decision-making approach that focuses on strict cost controls.

At this time, eCampus does not seem to follow the pattern of becoming more mechanistic as it matures. Instead, it may be moving toward a somewhat organic structure in which teams focus on slow cost growth based on highly efficient marketing and operations, innovative use of technology and alliances.

2. Compare and contrast the operational strategies of eCampus before and after bankruptcy.

Before bankruptcy, eCampus demonstrated frenzy behavior ((Perez, 2002) that was common among startup companies during the dot com bubble. The frenzy stage "is characterized by sense of exuberance as entrepreneurs and investors try to create a "big bang" eruption. They begin to increasingly confident and excited until their bubble bursts. eCampus had an abundance of investor and capital funds, there was excitement and feeling that it was a sure bet that eampus would go and producing extremely high returns on everyone's investment. Consequently, money was spent with little concern for control. Then, came the crash when the Internet bubble burst and the depths of Wallace Wilkinson financial problems became public. When the inevitable crash came, both capital and supplier confidence evaporated instantly.

eCampus' initial response was to institute drastic cost control measures. Human Relations reflected this lack of concern for cost control during both pre and immediate post launch stages of eCampus. HR played a large role in the first year of operations. A great deal of time and expense was devoted to securing, developing, and maintaining a highly talented work force. There was a great deal of effort and expense put into team building in an attempt keep the workforce motivated and innovation, productivity, and quality at high levels. This resulted in an organization bloated with highly talented and expensive personnel that would work at a frantic pace when challenged. These same individuals had high expectations of eCampus and were hard to keep motivated during the slack time between peak sales periods. This resulted in a high turnover and a major contraction and exodus of the workforce when they began lose faith in the eCampus' promises of an exciting work environment and chance of participating in an IPO.

The post-bankruptcy, eCampus entered the "synergy" stage in which successful firms are the established incumbents that survived the industry shakeout (Perez, 2002). Financial strength and using technology to achieve cost efficiency are emphasized. eCampus began to implement a lean organization strategy. The programming function was outsourced to India and South Africa; management levels were lean and flat, personnel cut to a few people in accounting, and a small staff of warehouse workers and order filler. The HR department was demote form its once strategic position in the company to a minor support function.

Marketing also reflected the lack of concern for cost control during the frenzy stage. eCampus cast a wide net that targeted both on-campus and off-campus students. They contracted a top advertising firm to produce top-notch commercials that aired on several cable TV networks. eCampus freely spent money on a wide variety of promotional campaigns. Their priced their biggest selling textbooks below all competitors while not charging customers for shipping. The combination of extravagant advertising and promotional spending, exorbitant personnel costs, malfeasance by Wilkinson, and the bursting of the dot com bubble resulted in bankruptcy of a promising start-up company.

The marketing strategy of the emergent company also reflects the lean strategy. Promotional efforts shifted from an expensive shotgun approach to an inexpensive, highly-targeted rifle approach. The original approach was success in creating a recognized brand name and high "mind share" within the college textbook market. eCampus sliced its advertising budget and instituted technology to capture information about every visitor its Web site and to target visitors with email ad that costs

practically nothing. They expanded their customer base public and private schools, colleges, universities, and business training programs that supply textbooks to students, customers and employees. As a result, their sales have increased substantially. They also have implemented an expanded used textbook purchasing program that provides a steady stream of low cost books and higher gross margins.

Finance and accounting strategies also changed because of a leaner and more cost conscious company. In the beginning, eCampus operated as though it had unlimited resources. They threw money at marketing, operations, and personnel without considering cost control or effectiveness of those expeditures. They worked without a budget. The original accounting software was incompatible with other information systems causing disruption in shipping, billing, and used book sales. The ability to get orders correct and fulfilled in a timely fashion is extremely critical to an online book company and was a major operations quality problem.

Implementation of the new accounting system has resulted in a big reduction in customer complaints, improved cost control, and provides management with more timely information and better information. The inability to raise capital remains a critical problem. Whereas in the frenzy stage, eCampus was flush with capital and it was easy to get more, now investors are very cautious and want to be solid evidence of actual returns or a high probability of returns on their investment.

3. Discuss corporate governance used by eCampus.

This is an excellent of corporate governance run amuck. Wallace Wilkinson duped the original investors into providing substantial amounts of money to capitalize the firm with hopes of generating funds for his cash starved Kentucky thorough bred horse farm, Wallace's Bookstores and WTC. He created a Ponzi scheme in which banks, capital investment firms and friends lost \$90 million. He misled executive managers and rank-and-file employees who had left good jobs elsewhere in the country and moved to Lexington to work for eCampus. The oversight of the new company now much tighter. There is closer cost and quality control, and there is much more transparency to all stakeholders. At this point, it might be a good idea to have student discuss whether eCampus might look very different today if this transparency existed in the first place, or whether even could existed at all under Wilkinson's control.

4. What are the prospects for the long-term survival of eCampus?

Long-term survival requires achieving the maturity stage. Perez (2002) describes this stage as characterized by market saturation and mature technologies. New growth opportunities are scarce and companies concentrate on increasing efficiency and reducing costs. Growth is achieved through mergers and acquisitions. The surviving companies have average returns, but try to leverage those returns by creating monopolies and oligopolies through mergers and acquisitions and expanding market reach.

Long-term survival for eCampus will depend on its ability to reduce cost with innovative uses of technology, forming strategic partnerships with publisher and possibly textbook authors, acquiring smaller competitors that will expand its market reach or provide innovative technology. eCampus has continued to surprise the authors with its resiliency. It has broken-even and started making a profit ahead of schedule. Management has done this through a program of coordinated cost reductions and expanding its market reach primarily through internal financing. The reengineering and lean strategy has truly worked. The decrease in resources has actually made eCampus a more efficient company whijle substantially increasing sales revenues. Management continues to expand its market through innovative programs such as the "Books-by-Course Program", Virtual Bookstore program, Web Partner program, and their VIP Member program.

Developing unique competitive competencies that competitors will find difficult to copy or beat will be the greatest challenge for eCampus. Currently, its resources and capabilities can be copied by other firms. At this point, the jury is still out as to whether eCampus has a long-term future.

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GENESIS, INC. CASE: ASSESSING EMPLOYEE SATISFACTION

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CASE DESCRIPTION

The primary subject matter of this case is human resource challenges of creating a new corporate culture following growth from a series of mergers and acquisitions. With a difficulty level of four and five, the case is positioned for senior human resources management classes at the undergraduate level or for beginning MBA classes in human resources, organizational behavior or management concepts. The case is designed to be taught in two 60 to 75 minute classes with the first session concentrating on the survey results and the second class focusing on implementing the cultural change process. It is expected to require three hours of outside preparation by students.

CASE SYNOPSIS

Genesis is a leading global supplier of nylon and carpet backing, yarns, and cord fabric. They are also a manufacturer of industrial textiles, reinforcement materials, and yarn used in the production of artificial turf, tires, conveyor belts and webbing. Their polyester coating fabrics are the reinforcing material for tents, tarpaulins, and awnings.

Over a fifty-three year history, the company has grown throughout its seven international locations. As the specialty fibers industry has matured, the company has strategically pursued mergers, purchases, and combining plant locations. This industry consolidation is expected to continue in the future.

At one of their North American plants headquartered in Dalton, Georgia, problems with employee relations resulted from the jumbled corporate culture that evolved from a recent merger and acquisition. Employees remained uncertain and anxious about their future with the company. After reviewing the company mission and history, Genesis management agreed a baseline level of employee satisfaction was needed. With the help of an outside human resources consultant, an employee survey was administered to 253 employees to determine their level of satisfaction with the workplace and culture as well as a number of key human resource practices and issues including management communication, employee feedback, compensation and benefits, and employee recognition programs.

Students are provided the survey results and summaries of open-ended comments and are asked to make recommendations to management and suggest improvements to establish a new, single, cohesive corporate culture.

INSTRUCTORS' NOTES

Recommendation for Teaching Approachs

Given the survey data provided and open-ended employee comments, this case is best used as a team presentation or team analysis resulting in a consultant's report suitable for presentation to top management. The case provides rich data and comments that, when analyzed point to needed improvements in the company. Students enjoy the case and another option is for them to develop a presentation using PowerPoint and present their findings in a formal business presentation.

Decision Focus

A growing yarn, textile, and backing manufacturer has experienced a host of internal human resources challenges following an industry merger and acquisition in their Georgia plant. Three different employee groups seem to be operating in the production environment. Because the job schedule and benefits have changed, senior workers have experienced the many changes and are unhappy. New employees do not feel welcome. All groups want more communication from management. Students are asked to provide recommendations to management for improving the culture as well as to develop a time line and order of implementation for the recommended changes.

Main Features of the Case

The case study is the result of an actual consulting project. The original survey was developed specifically to focus on the issues at the organization. The case is timely as it considers issues and challenges in mature industries facing consolidation and re-organization. The current time frame of the case is also important in that students are asked to consider the effect of a slowing economy on the company as well. Students are often interested in consulting and will appreciate the scope of the project. Analyzing and interpreting the qualitative data is an important skill. The case reinforces the key themes of human resources and as such is a good review for students and an alternative way to explore the concepts.

LEARNING OBJECTIVES

After studying and discussing the case study, students should attain the following learning:

- 1. Recognize issues necessary to improve organizational culture.
- 2. Discuss improvements needed for the job, communication and feedback, compensation and benefits, and recognition.
- 3. Assess what practices are appropriate and should be continued.
- 4. Develop a time line and order of implementation for the recommended changes.
- 5. Consider ways to maintain morale in light of potential layoffs and cut-backs in jobs and work loads.
- 6. Recognize issues that must be changed to improve the safety/injury record at Genesis.

Potential Curriculum Uses

The primary subject matter of the case is human resources and the challenges of creating a new corporate culture following growth from a series mergers and acquisitions. The case has a difficulty level of four and five and is positioned for senior human resources management classes at the undergraduate level or for beginning MBA classes in human resources, organizational behavior or management concepts. The case is designed to be taught in two 60 to 75 minute classes with the first session concentrating on the survey results and the second class focusing on implementing the cultural change process. It is expected to require three hours of outside preparation by students. The case is suitable for team projects including an analysis, report, or presentation. Students can act as the consultant and present their findings and recommendations to top management. It is also appropriate as a case in a "special topics" course in human resources.

This case could be used in a general management class as the teaching tool for organization culture. Rather than through the lecture method, each aspect of culture (functions, why a strong culture is needed, elements in managing culture, socialization, assessment of organizational culture, situations that may require cultural change or how to continue the new culture) can be presented followed by a student led discussion after the case analysis.

It could be used in a Human Resource Management case illustrating how layoffs, schedule changes, and resentment can affect productivity. It also illustrates how employees normally can make suggestions in the informal communication network that indeed can be beneficial to the company and avoid problems. Using formal networks and informal networks can lead to solution with little cost to the organization.

CLASS ASSIGNMENT QUESTIONS AND ANSWERS

1. What are your recommendations for management to improve the culture of Genesis?

The functions of organizational culture are to provide a sense of identity to members and increase their commitment to the organization, to reinforce the values in the organization, and serve as a control for shaping behavior. Genesis recognized that to improve performance they must build a strong, cohesive corporate culture. That strong culture helps to facilitate performance because the values that may be adopted are goal alignment, a high level of motivation, and control without the oppressive effects of bureaucracy.

Two situations in this instance that may require cultural change are the merger/acquisition that occurred recently and employment of people from different countries. The culture might be difficult to change because employees are not always aware of the corporate culture and it is so deeply ingrained and behavioral norms and rewards are based on the past.

To build a corporate culture or change the current one, management could do the following: management can communicate and let employees know what is important by what they pay attention to, how they react to crises (the economy), how they behave, how they allocate rewards, and how they hire and fire individuals.

Additionally, socialization needs to take place through cultural communication by management serving as role models, providing better training, and rewarding those who are adapting to the desired corporate culture, plus hiring those that will be a good fit into the new, changed culture.

2. What specific recommendations are needed for the job, communication and feedback, compensation and benefits, and recognition?

Recommendations are provided by many of the employees who seemed satisfied with the company. For the job, suggestions were better training, equipment maintenance running better and updating processes and equipment. For communication and feedback, employee suggestions include communicating through newsletters provided to each employee, providing opportunities for socializing and interacting between management and professionals and the employees. Schedule a weekly meeting with supervisors and employees and make announcements and leave time for questions. This will help employees feel informed and involved.

About half of the employees felt that compensation and benefits were good but the employees who had worked for Global International prior to working at Genesis felt they had lost benefits and work earning less. It appears employees were not informed about the schedule, overtime, and benefits changes that would result at Genesis. This was a mistake and should be done before any new groups of employees are merged with existing employees. As far as the schedule, many workers indicated they would like working a regular shift and being able to have a better schedule with their family, so that would be something that management could emphasize.

3. What does Genesis seem to be doing right? Should these practices be continued?

The majority of employees felt that they were working for a good company. As shown in Exhibit 2, human resources are doing a good job communicating benefits. Selection, screening, and hiring are on track as almost three fourths of employees feel they are using their talents and skills appropriately on the job.

4. Develop a time line and order of implementation for the recommended changes?

The time line in order to see results from the recommendations provided in Question 2 will not be immediately noticeable. What is being done to bring about corporate change can be implemented within the next three months. Training can be updated immediately and an on-going schedule of training can be developed and posted. A newsletter can be prepared and distributed within the next month, meetings can be phased in over the next month, and company parties, picnics, and social gatherings can be planned with employees invited to participate at the appropriate times such as Fourth of July, Labor Day, Thanksgiving, and Christmas/ Hanukkah/Kwanza or even a pizza party at lunch or at the end of a shift to let employees know they are valued.

5. When should the company expect to see improved morale and why?

Improvement in morale should begin to improve as soon as employees see that their suggestions are being implemented. As reported in the Hawthorne Studies, if employees feel they are cared for, they will respond positively by increased productivity and increased morale.

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6. How can the company perpetuate the "new" culture for the future, particularly if additional mergers and acquisitions are forthcoming?

The "new" culture can be perpetuated by a) changing behavior, b) examining justifications for changed behavior, c) cultural communication, d) hiring and socializing members who fit in with the new culture, and e) removing members who reject the new culture.

7. If the economic downturn and recession persists, how can the company maintain morale in light of potential layoffs and cut-backs in jobs and work loads?

Genesis can continue to reassure employees they are committed to the success of the company and even though tough times may be coming, they intend to provide employees a safe environment in which to work, one that will remain in business, and will be able to weather this downturn because of the size of the company because of the many mergers. Work loads may decline temporarily until the economy improves. Management should communicate all economic issues and challenges to employees and proactively seek their advice and suggestions to make the company more profitable, productive, and jobs more secure. As can be learned from the survey results, employees want to be kept informed and do not like surprises, particularly as they concern their job.

Alternatives to downsizing include redeployment, freezing recruitment, disengaging contractors and other flexible workers, reducing overtime, job sharing, wage cuts, retraining, increasing labor productivity, and smart cost reductions. Moving employees to sales positions rather than manufacturing is also an option.

An "A" student will realize that given the downturn in the economy, this is a good time to create awareness of why change is needed.

8. What top changes are necessary to improve the safety/injury record at Genesis to previous levels?

Communication is important to keep safety at the top of everyone's agenda. Management should stress the importance of safety and schedule regular safety meetings to discuss issues. Employees should be encouraged to offer suggestions for improvement (lighting, work flow, equipment or material layout, etc.). An on-going productive maintenance program is important and upgrading of equipment as necessary. Employees should be cross trained to maintain their own equipment. Employees should be rewarded for their ideas or these could be mentioned in the company newsletter. Management following procedures and emphasizing safety is also important. Employees should be provided with appropriate equipment to ensure their safety.

9. Discuss change management and Lewin's unfreeze-change-refreeze theory of organizational change as it relates to Genesis.

Organizational change management processes include techniques for creating a change management strategy (readiness assessments), engaging senior managers as change leaders

(sponsorship), building awareness of the need for change (communications), developing skills and knowledge to support the change (education and training), helping employees move through the transition (coaching by managers and supervisors), and methods to sustain the change (measurement systems, rewards and reinforcement).

Management's responsibility is to detect trends in the macro environment as well as in the micro environment so as to be able to identify changes and initiate programs. It appears management did not anticipate the issues that would result from the merger and acquisition and did not prepare for them. Before other changes are made, it is important for managers to brainstorm and estimate what impact a change will likely have on employee behavior patterns, work processes, technological requirements, and motivation. Management must assess what employee reactions will be and craft a change program that will provide support as workers go through the process of accepting change. The program must then be implemented, disseminated throughout the organization, monitored for effectiveness, and adjusted where necessary.

Organizations exist within a dynamic environment that is subject to change due to the impact of various change "triggers", such as evolving technologies. To continue to operate effectively within this environmental turbulence, organizations must be able to change themselves in response to internally and externally initiated change. However, change will also impact upon the individuals within the organization. Effective change management requires an understanding of the possible effects of change upon people, and how to manage potential sources of resistance to that change. Change can be said to occur where there is an imbalance between the current state and the environment.

An early model of change developed by Lewin described **change** as a three-stage process. The first stage he called "unfreezing". It involved overcoming inertia and dismantling the existing "mind set". Defense mechanisms have to be bypassed. In the second stage the change occurs. This is typically a period of confusion and transition. We are aware that the old ways are being challenged but do not yet have a clear picture of how to replace them. The third and final stage he called "freezing". The new mindset crystallized and comfort levels returned.

An "A" student should mention that unfreezing would be to change the culture with meetings, newsletters, and other involvement activities. In the second stage the change occurs to implementing a new, "open" culture. The final stage of "refreezing" means the new cultural mindset is crystallizing and one's comfort level is returning to previous levels.

10. Given the issues mentioned in the open-ended responses, what should management change or address and why?

Based on the various open-ended comments management should continue to address training in both the processes and equipment. This training is important to blend the various employee groups and will also improve safety. Language classes are important so all groups understand basic English, particularly as it relates to troubleshooting and repairing the equipment.

As for improved communication requests in Question 25, management should actively solicit more input from employees and more importantly, communicating information in a timely manner and not at the "last minute" even if it is bad news. Adding a newsletter and short, weekly meetings

to relay information is important to improving feedback. Providing positive comments to employees is important too and is currently lacking in the culture.

While addition additional benefits may be difficult in the current economic climate (Question 31), management may want to investigate better insurance and the vacation buy-back policy. Wellness programs and a gym or fitness center might even save the company money in insurance claims and accidents. As Questions 32 also indicated, benefits are important to employees. A key issue is sick leave and personal days. HR may want to investigate a policy for sick leave or sick day accumulation for employees or add a personal day employees can use to take care of doctor and dentist visits.

Recognition suggestions in Question 36 were many. Employees first and foremost would like a simple "thank you" and recognition from management and this would add no cost to the company. As funds permit, compensation for a job well done and perhaps a bonus or profit sharing could be considered. Overall, as previously mentioned, employees are happy working for Genesis and even with the changes in pay; they agree it is a good place to work for the most part. They wish they had more recognition and that supervisors acted more fairly and communicated changes in advance. Employees don't like learning about changes or bad new after the fact. By making employees part of the process, the on-going changes the company will experience can be handled better. Employees given ownership for challenges and problems can often develop good, workable solutions that all will be happy with. Even if they are not "happy" with the solutions, they will feel part of the process and this is lacking currently.

Employees' reflections of workload at Genesis (Question 38) were mostly positive except a few comments point to needed improvements in tooling and the additional time needed to trouble shoot problems with equipment. Spinning areas reported an increased workload and another area reported too much work without a packer and trained partner. These jobs and areas need to be reviewed and assessed to ensure proper coverage is available.

Question 39 and 40 again focused on communications at Genesis. Most feel communication could be improved and believe communication from bottom to top is lacking. Management needs to spend more time listening to employees and sharing information. Training and employee involvement is needed on an on-going basis.

Employees pointed the way for improvements in Questions 41 for more group involvement, more meetings, and more employee recognition and even shift get-togethers to improve teamwork. Finally, Question 42 summarized it best by making people a priority. Some simple training/open discussion on culture differences between these two groups could be beneficial and help us to better understand each other.

11. Interpret the survey data provided in each of the categories (about my job, communication and feedback, compensation and benefits, and recognition). What should management change or address and why?

One way to analyze the data is by assigning a numerical value for each response category (Strongly agree = 5, Agree = 4, Neither Agree nor Disagree=3, Disagree =2, and Strongly Disagree = 1). Then compute a weighted response by multiplying the number of responses in the category by

the numerical value. You should eliminate the "did not answer" responses from your calculations. Finally, sum these numbers to get a response index for each question. Rank the issues, by response index from highest to lowest. The implication is that those questions with a lower response require more attention while those with a high response do not require attention. Note for question 19 in the section "About My Job," the responses should be "reverse coded" since this question is worded negatively and the other questions in the survey are worded positively.

12. What will you address first in each category? What does not need to be changed?

Tables summarizing the numerical analysis are at the end of this teaching note and can be copied and distributed to students as they check their answers. For the questions about the jobs at Genesis, the Response Index Ranking indicates the company is doing a good job explaining job expectations to employees (Question 2), employees are also given the chance to make daily use of their skills and abilities (Question 8), and employees feel their efforts make a positive difference in the success of the Genesis organization (Question 7). Students should note, however, the highest mean score for any question in this section is 4.1032 (Question 2) which falls just above the "agree" score. Interpreting the scores about employees' jobs indicates there are no questions where employees feel "strongly" about the issues. The bottom three ranked issues about the job concern employees' lack of resources and job support (Question 4), the level of cooperation within the company in helping them perform their job (Question 12), and the workload expected (Question 3). The company should begin to address these issues first since they have lower scores.

In the communication and feedback questions, the top questions concern the approachable nature of the supervisor (Question 23), the ability of the supervisor to listen about ideas and issues from the worker (Question 20), and the fact the company regularly and effectively communicates organizational goals and objectives (Question 15). Students should note, however, that there is not a real difference between the top and bottom ranked questions in this section as the means range from a 3.57 to 2.73 falling primarily into the "Neither Agree or Disagree" category. The lower scoring issues are about feedback (Question 18), how complaints and concerns are handled (Question 22), and how changes are communicated in advance (Question 17). Since scores are somewhat neutral in this section, the company should address all levels of communication and feedback first in their change efforts.

For compensation and benefits with only five questions, the top positive issue is that employees understand the benefits provided by the company (Question 29). The lowest ranking issue is that employees contributions are appropriately compensated (Question 26). Again the range of means for these compensation and benefits questions is small and all fall into the neutral category indicating this is another key area for Genesis to address.

The final category of recognition had the most varied responses. While employees agree they value recognition and praise (Question 34 with a mean of 4.088) they do not feel the company offers them recognition in appropriate ways (Question 33 with a mean of 2.72). The largest gap in the entire survey is between the praise and recognition employees want and the praise and recognition they actually receive. In fact, students may note the mean score on Question 33 is the lowest of all the survey questions. Human resources managers and all levels of upper management at the company

should work to reward employees and develop ways to recognize and reward employee effort and accomplishments. Working together with employees in a team, managers can more successfully identify the types of reward and recognition that their employees most value.

TEACHING APPROACH AND PLAN

The class can consider the assignment questions above as a home work assignment individually or more appropriately, as a team assignment. Students need sufficient time to review the survey results and open-ended comments as they develop their change plan. While the case itself is simple to understand – a company has experienced employee challenges as a result of combining three different groups of workers – the difficulty of the case comes in analyzing, synthesizing, and interpreting the data and developing action plans for implementation.

The case can also be taught as an in-class assignment where students work to organize the data. Arrange desks or tables away from the wall to allow students room to work. Post the key themes or areas of HR considered in the case on the wall on large sheets or on post-it notes or write the words on the board if space allows. The concepts include the (1) job itself, (2) communication and feedback, (3) compensation and benefits, (4) recognition, and (5) other issues. Divide the students into five groups and give each group a pad of "post-it" notes and ask them to record survey results on the notes and using an "affinity diagram" methodology, group the responses into one of these five areas. Allow the groups about 30 minutes to record the issues into their area and develop a solution for each area. Go around the room and have each student group present the results to the class. This exercise is useful for breaking the case into a more manageable discussion.

If students are not familiar with affinity diagram, explain that it is a business tool used to organize ideas and data. The tool is commonly used within project management and allows large numbers of ideas to be sorted into groups for review and analysis. Students can record each employee response on their "post-it notes" and then look for ideas that may seem to be related. They can then sort the notes or index cards into groups until all cards have been used. Once the cards have been sorted into groups the team may sort large clusters into subgroups for easier management and analysis. When completed, the affinity diagram may be used to create a cause and effect diagram or look for relationships. End the class with a discussion of how to prevent this situation from occurring in the future given that consolidation of the mature industry is expected to continue.

EPILOGUE – SPRING 2009

Management at Genesis was fairly happy with the results from the survey. After the consultant presented the summarized information, Genesis realized workers had a reasonable amount of employee satisfaction from job, work, benefits, and feedback. Some of the suggestions had already been implemented after receiving similar ideas in the plant suggestion box. While nothing could be done about changing work schedules because of the weakening economy and reduced demand for their products, management realized they should communicate this fact with employees. On-going changes continued and approximately twenty-five percent of the work force was reduced and some international plants were consolidated. The attempt to

change other facets of the corporate culture has been put on hold. With the current economic recession, worldwide demand for their products is down.

	Strongly Agree x 5	Agree x 4	Neither Agree or Disagree x 3	Disagree x 2	Strongly Disagree = 1	Total Responses (less did not answer)	Total & Response Index	Mean	Response Index Ranking
MY JOB:									
1.Overall, I feel this is a good place to work.	260	476	144	42	9	249	931	3.739	4
2. I clearly understand the expectations of my job	380	572	63	14	5	252	1034	4.1032	1
3. The workload expected of me is realistic	125	412	165	94	21	251	817	3.255	11
4. I feel I have adequate resources and support to do my job	120	336	180	112	27	251	775	3.0876	13
5. The orientation to my job adequately prepared me	130	416	189	62	16	240	813	3.3875	9
6. I have the decision-making authority I need to do my job well	255	408	147	66	11	246	887	3.6057	6
7. I feel my efforts make a positive difference in the success of this organization	300	460	132	42	11	251	945	3.7649	3
8. I have the chance to make daily use of my abilities and skills	285	528	114	38	6	252	971	3.8532	2
9. I enjoy performing the day-to-day activities of my job	215	344	213	64	14	246	850	3.4553	8
10. My work schedule allows me sufficient flexibility to meet my personal/family needs	285	284	165	68	30	247	832	3.3684	10
11. Employee relationships are based on trust	320	388	153	36	21	251	918	3.6574	5
12. The level of cooperation within the company helps me in performing my job	100	348	261	70	21	250	800	3.2	12
13. I received the appropriate training to perform my job	200	456	165	48	12	245	881	3.5959	7
Communication and Feedback:									
15. Genesis, Inc. regularly and effectively communicates organizational goals and objectives	100	488	192	70	10	251	860	3.426295	3
16. New and existing policies are clear, communicated in a timely manner and easily available	65	348	219	116	20	251	768	3.059761	7
17. I am informed about big changes in advance, instead of being caught by surprise	55	236	216	136	39	249	682	2.738956	10

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	Strongly Agree x 5	Agree x 4	Neither Agree or Disagree x 3	Disagree x 2	Strongly Disagree = 1	Total Responses (less did not answer)	Total & Response Index	Mean	Response Index Ranking
18. I receive regular and effective feedback that helps me improve my job performance	95	272	234	120	23	248	744	3.0	8
19. My supervisor is not specific enough when giving me feedback about my job performance	160	316	204	112	11	246	803	3.264228	6
20. My supervisor listens to me when I have issues or ideas about improving my job	240	348	201	58	18	249	865	3.473896	2
 My supervisor's actions and behaviors are consistent with her words 	185	344	198	76	21	248	824	3.322581	4
22. I am satisfied with how complaints and concerns are dealt with	95	248	204	130	38	252	715	2.837302	9
23. My supervisor is approachable and available whenever I have a need	240	424	159	48	18	249	889	3.570281	1
24. The supervisor has a good understanding of what is happening in this facility	195	352	174	56	33	246	810	3.292683	5
Compensation and Benefits:									
26. I feel that my contributions are appropriately compensated	95	368	195	106	22	251	786	3.131474	5
27. I believe compensation is competitive to the local marketplace	130	444	198	64	17	252	853	3.384921	3
28. I believe compensation is in line with the workload and expectations of the organization	110	340	204	96	24	247	774	3.133603	4
29. I believe I understand the benefits provided by the company.	195	580	162	14	6	251	957	3.812749	1
30. I believe benefits are competitive to other similar companies	190	444	177	26	18	239	855	3.577406	2
Recognition:									
33. Genesis, Inc. offers recognition to individuals in appropriate ways	50	216	246	126	40	249	678	2.722892	3
 Recognition or praise is something I value 	470	392	141	16	3	250	1022	4.088	1
35. At Genesis, Inc. recognition or praise for doing a good job is rare	315	272	171	68	12	234	838	3.581197	2
*Answers to Question 19 were reverse	coded to ma	atch the	scale on the o	other "positiv	vely-worded'	responses of	the other que	estions in	this section.

BAMA DRINKS COMPANY: AN INVENTORY CASE PORTFOLIO

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CASE DESCRIPTION

The primary subject matter of this case concerns managing inventory shortages and their associated costs. Secondary issues examined include: inventory costs, inventory policies, forecasting sales, and prioritizing customers. The cases have a difficulty level of 3, junior level, for cases (A) and (B) and level 4, senior level, for cases (C) and (D). The cases are targeted to operations management, inventory management, and supply chain management courses. The cases are designed to be taught in 2 class hours and are expected to require 4 hours of outside preparation by students.

CASE SYNOPSIS

The cases address the inventory issues faced by a distributor of soft-drinks, Bama Drinks Company. The discussion about inventory policies starts when an important customer places an order and the product is not in stock. Since demand with newer customers has begun increasing, some of Bama Drinks' regular customers have been forced to accept some late shipments. This sparks the discussion about whether all customers should be treated equally and the company's inventory policy in general.

In Case (A) students are exposed to the realism of managing inventory shortages and their associated costs. Some of Bama Drinks' functional managers are introduced, and their mention is continued throughout the case portfolio.

Case (B) provides specific cost details (e.g., leasing, freight, order placement, and holding costs) and requires the students to develop inventory ordering policies (economic order quantity and reorder point). It also asks the students to determine the needed inventory storage space based on the inventory policies – a serious management issue.

Case (C) builds on the techniques utilized in Case (B) by adding the realistic complexities of predicting future sales when a trend and seasonality are present. This is essential to overcome since inventory policies are based on future, rather than historic, sales patterns. The more accurate the sales forecast, the more realistic the inventory policies can be. It also gives the students the opportunity to explore different sales forecasts using numerous mathematical formulations. Thus, the students learn the linkage between forecasting and inventory decisions and the reality that an accurate forecast must precede.

Finally, Case (D) explores the difficult, but realistic situation of having different service levels for various customers. Prioritizing customers is necessary for they do not all represent the same economic benefit to the company. The trade-offs necessary when designing such inventory policies are explored.

INSTRUCTORS' NOTES

BAMA DRINKS (A)

Suggested Answers to Case Questions

1. Which inventory costs might Natalie be calling expensive?

Inventory holding costs. This includes cost of capital or investment in inventory cost. Here the instructor can introduce the concept that not having inventory is costly too. It can lead to the loss of customers, expediting, discounts, etc. This issue is important for discussing the differences in backordering costs and the discussion about different demand classes in the second part of the case.

2. What does Natalie mean by saying that they use a 90% fill rate?

Fill rate is the fraction of demand that is met without backorders or lost sales (Silver *et al.* 1998). For an inventory management course alternative service measures, e.g., fraction of cycle without stockouts or ready rate, can be discussed.

3. Which inventory policy is Bama Drinks using?

At this time, the company uses an order-point, s, and order-up-to quantity, S. This is known as an (s, S) policy. This system is frequently encountered in practice (Silver *et al.* 1998, p. 239). Silver *et al.* note that values for s and S are usually set arbitrarily. An inventory management class could address how to obtain reasonable values for s and S.

4. What are some alternative inventory policies that Bama Drinks could use?

At this time, the instructor can introduce a variety of policies; (s, Q), (s, S), (R, S), and (R, s, S). These policies are defined by order-point, s; order-up-to quantity, S; order quantity, Q; and review period length, R. For the introductory operations management class we address the conceptual difference between continuous versus periodic review and order quantity versus order-up-to level. For an inventory management class this can lead to a more in-depth discussion.

5. Which changes to Bama Drinks' inventory policy do you suggest?

We note that experiencing a few stock-outs might not justify changing the company's inventory policy. However, if analyses indicate that there is a systematic problem, changing the reorder point or safety stock levels would be appropriate.

BAMA DRINKS (B)

Suggested Answers to Case Questions

1. For the moment ignore the freight cost. Using the economic order quantity (EOQ) model, determine the inventory order quantity that would provide the lowest total inventory ordering, and holding cost?

$$EOQ = \sqrt{2DS/H}$$

Where D= annual demand, S = ordering cost, and H = the cost to hold one unit of average inventory for one year.

$$EOQ = \sqrt{2*20,600*25}$$
 = 641.87 cases
2.50

2. Now including the freight cost what is the economic order quantity that would provide the minimum total inventory, holding, and freight cost? Does adding in the freight cost make much of a difference in the economic order quantity? Does the EOQ increase or decrease? Is that what you expected?

To show how freight cost should be handled we need return to the total inventory cost model (ignoring the product cost since it is constant).

$$TC = 1/2QH + (D/Q)S + (D/Q)F$$

Where: Q = the economic order quantity and F = the freight cost per shipment (regardless of size)

Therefore, EOQ = $\sqrt{2D(S + F)}/H$ EOQ = $\sqrt{2^*(20,600)^*(25 + 100)}/2 = 1,014.89$ cases.

Assuming the freight cost is constant, including the freight cost per order or shipment makes a significant difference in the EOQ. It can make the EOQ much higher. One way to reduce the EOQ is to imbed the freight cost into the product selling price.

3. Using your answer to question (1), what would be Bama's total inventory ordering and holding cost for the year?

TC = 1/2QH + (D/Q)STC = 641.87 * 2.50 + 20,600 * 25 = \$802.34 + \$802.34 = \$1,604.68

4. Again using your answer to question (1), how many orders should Bama place per year?

The number of orders per year = D/Q = 20,600/641.87 = 32.09 orders per year or one order every 250/32.09 = 7.79 days.

5. Given a lead time of three days at what inventory level should Bama place an order?

r = d * L

Where, r = the reorder point, d = the daily demand, and L = the lead time; in this case the number of days of lead time

$$r = (20,600/50*5) * 3 = 247.20$$
 cases

6. Assuming: (1) a case of soft drinks requires 2.5 square feet of floor space and, (2) the case stacking conditions mentioned in the case, what is the maximum amount of storage space (floor space) Bama would need in its warehouse to store inventory?

The maximum inventory Bama should have in its warehouse is the moment the EOQ quantity arrives. This is at 641.87 or 642 cases. If each case requires 2.5 square feet of storage space, this is 1,605 square feet. Stacked three cases high this would result in a need for 1,605/3 = 535 square feet of floor storage space needed.

BAMA DRINKS (C)

Suggested Answers to Case Questions

1. Is Bama experiencing a pattern of seasonality in its sales or are the seasonal fluctuations just random?

As shown by the Line Chart of Raw Sales the company is indeed experiencing seasonality in its sales. Typically, sales are at the low point for the year in the first quarter and rise to a pronounced spike in the fourth quarter. Thus, Bama should indeed forecast sales for 2009 and adjust them for seasonality.

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Line Chart of Raw Sales

2. If sales are indeed increasing per year and the company sales are experiencing seasonality what should the expected sales figures for 2009 be? And, how should the expected sales figures be determined?

This question assumes that students have an understanding of forecasting techniques. If forecasting is not covered in a prior course, students can study the forecasting topic in the OM course before inventory. With basic knowledge of forecasting techniques, the students should be able to forecast seasonally adjusted sales for the 2009 year. Perhaps the easiest method for forecasting sales that exhibit seasonality is to use the *annual method*. In this technique the students total the sales for each year. The yearly totals become the dependent variables and the years (1, 2, 3, etc.) are the independent variables. Linear regression is then used to determine the equation for this time series and in this case is used to forecast the total sales for 2009.

For this case the linear regression equation was determined to be:

$$Y = 11,667.93 + 1605.5$$
(Year)

This regression helped explain 81% (R²) of the variation in the annual sales. While other mathematical formulations (e.g., a chart and regression function for a quadratic function is provided.) may better represent the relationship, for pedagogical purposes the linear expression seemed sufficient.

Next, the percent that each quarter represents of annual sales is determined. This is done by totaling the sales over all years for each quarter. The total sales over all years per quarter are divided by the total sales over all the years. Once these percents are determined, each is then multiplied by the total sales projected for (in this case) 2009. Next seasonalized sales by quarter for 2009 have been projected. Bama would also have an idea of how much each quarter (on average) represents of annual sales. These figures are provided in the table below.

Quarterly Sales as Proportion of Annual Sales		Seasonalized Sales Projected Quarterly Sales (2009)			
Q1	0.1975	Q1	4,523.24		
Q2	0.2272	Q2	5,204.97		
Q3	0.2184	Q3	5,003.13		
Q4	0.3569	Q4	8,174.83		
		Total	22,905.73		

Thus, using this technique the projected, seasonalized sales of cases (rounded off) for 2009 are:

Quarter 1	4,523
Quarter 2	5,205
Quarter 3	5,003
Quarter 4	8,175

3. If inventory policies are tied to expected future sales, not past sales, what should Bama's inventory policies be for 2009?

Bama should adjust its inventory policies for 2009 for two reasons: sales are increasing and they have definite seasonality in their sales. Assuming sales are relatively constant within each quarter, they should calculate and use an EOQ for each quarter based on the projected, seasonalized, quarterly sales for 2009. The EOQ calculations shown on the Data Sheet were determined using the following EOQ formula adjusted for quarterly sales.

EOQ each quarter of $2009 = \sqrt{(2^{(quarterly demand)^{(\$25)/(\$2.50/4))})}$

This produces the quarterly EOQs for 2009 (rounding up):

Quarter 1	602
Quarter 2	645

Quarter 3	633
Quarter 4	809

Had the EOQ been based on the entire 2009 sales it would have been:

EOQ =
$$\sqrt{(2^{*}(22,906)^{*}(25)/(2.50))} = 676.8$$
 or 677

This would indeed explain Natalie's comment that inventories seemed overstocked in early quarters and insufficient in later periods.

BAMA DRINKS (D)

Suggested Answers to Case Questions

1. Which changes can Bama Drinks make to the inventory policy to increase service levels?

In this case, the company measures service level with fill rate (see question 2). The fill rate can be improved by increasing safety stock (SS) or by increasing the reorder point (s). A company keeps SS because of the stochastic nature of demand. Hence, when the *variability* of the lead time demand has increased it would be appropriate to increase SS. This in turn would also increase the reorder point since the reorder point = lead time demand + safety stock. When the lead time demand increases, it is appropriate to increase the reorder point. If the variation has not changed, the safety stock levels remain the same.

2. What trade-offs should be considered when setting service levels?

The fill rate balances the costs of having too much inventory (holding costs) versus not having enough inventory (shortage costs). The service level is set based on the relative costs of holding inventory, r, and the cost of being short of inventory per unit time (B₃). The optimal fill rate is then; $P_2 = B_3 / (B_3 + r)$. (Silver *et al.* 2001, p. 245).

3. Based on Jamison's comment above, design a new inventory policy for Bama Drinks.

Jamison indicates that he would like to recognize the difference in customer importance in the new policy. Hence, he eludes to establishing demand classes.

Keep separate inventories

Many organizations have recognized that they need different inventory policies for different customer groups. Not utilizing the differences in service requirements among customers and therefore using an aggregate service level is costly (e.g. Deshpande *et al.* 2003). When the aggregate service level is too low customers will be lost. When the service level is too high for some demand classes, the company invests too much in inventory.

In practice, some companies have physically separated the inventory while others have created different SKUs for the various demand classes. A drawback of these approaches is that the company does not take advantage of inventory pooling (Deshpande *et al.* 2003).

Multiple Demand Classes

The multiple demand class issue becomes important when different groups of customers, or demand classes, have different service restrictions with the supplier e.g., costs of lost sales, backordering costs, differing service level contracts. When inventory is low, it is then reasonable to reject the demand from less valuable classes (Ha 1997). Hence, the company *rations* inventory. One way to ration inventory among demand classes is the use of rationing points, or *critical levels*, (c_i) (e.g., Arslan *et al.* 2007)). If inventory is below the critical level of a demand class, any demand from this demand class will be backordered. Demand from the higher priority demand classes will still be satisfied when it occurs. Hence, a company can have on-hand inventory and backorders at the same time.

The multiple demand classes approach is presented in figure 1 below. In the figure, the company is using an (s, S) policy, like Bama Drinks.



Figure 1: Diagram for Three Demand Classes

Where, c_i is the critical level, L is the replenishment lead time, and S is the order up to level in the (s, S) policy.

Extension

For an inventory management class an interesting follow-up discussion can address the issue of deciding which backorder should be filled first when a replenishment arrives. Also, if

replenishment is insufficient should (a) backorders for lower priority demand classes or (b) inventory for higher priority demand classes be replenished first? These issues are also important discussions in the literature (e.g., Arslan *et al.* 2007).

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CAPE CHEMICAL: CASH AND PROFITS

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CASE DESCRIPTION

The primary subject matter of this case concerns the difference between cash and accounting profits and the problems a company can encounter if profits and cash are assumed to be the same. Secondary issues examined include the preparation and interpretation of the statement of cash flows, fundamentals of working capital management, and financial statement analysis. The case requires students to have an introductory knowledge of accounting, finance and general business issues thus the case has a difficulty level of three (junior level) or higher. The case is designed to be taught in one class session of approximately 1.25 hours and is expected to require 3-4 hours of preparation time from the students.

CASE SYNOPSIS

The case tells the story of Ann Stewart, President and primary owner of Cape Chemical. By almost all measures, the performance of Cape Chemical has been very good over the last three years (2005-2007). Double-digit sales growth has been achieved, new product lines have been added and profits have more than tripled. But despite this apparent success, cash flow has been a problem. It has been a struggle for Stewart to maintain sufficient cash to pay obligations in a timely manner. The company reached its bank-borrowing limit at the end of 2006, but Williams successfully negotiated an additional \$3,000,000 in long-term borrowings using fixed assets as security. The additional \$3,000,000 was used during 2007 as well as an extra \$1,000,000 provided by a working capital loan extended by the bank. At the end of 2007 the debt ratio was 71% and the TIE ratio was 1.81. The bank has refused to grant additional loans until the debt ratio can be lowered to below 50% and the times interest earned (TIE) ratio increased to above four.

INSTRUCTORS' NOTES

Case Overview

Cape Chemical is a relatively new regional distributor of liquid and dry chemicals, headquartered in Cape Girardeau, Missouri. The company, founded by Ann Stewart, has been serving southeast Missouri, southern Illinois, northeast Arkansas, western Kentucky and northwest Tennessee for five years and has developed a reputation as a reliable supplier of industrial chemicals. Stewart's previous business experience provided her with a solid understanding of the chemical industry and the distribution process. As a general manager for a chemical manufacturer, Stewart had profit and loss (P&L) responsibility, but until beginning Cape Chemical, she had limited exposure to company accounting and finance decisions.

The company reported small losses during its early years of operation, but performance in recent years has been very good. Sales have grown at double-digit rates, new product lines have been added and profits have more than tripled. The growth has required the acquisition of additional land, equipment, expansion of storage capacity and more than tripling the size of the work force. Stewart has proven to be an expert marketer, and Cape Chemical has developed a reputation with its customers of providing quality products and superior service at competitive prices.

At the insistence of Stewart, the company has promoted "next day delivery" since its inception. This requires Cape Chemical to carry a large number of products and large quantities of each item. As Cape Chemical has added new product lines, more and more dollars have been invested in inventory. Other chemical distributors can seldom provide "next day delivery" service because they don't stock the number of products and the quantity of each carried by Cape Chemical. Not surprisingly, "next day delivery" has proven very popular with its customers and has allowed Cape Chemical to capture a large market share. The sales force is also a strong supporter of the service, but because occasional inventory shortages cause sales to be missed, they are constantly arguing for even greater amounts of inventory to be maintained by the company. Stewart has tended to agree with the sales force and has over the years instructed the purchasing department to err on the side of carrying too much rather than too little inventory.

Stewart has also used a liberal credit policy to stimulate sales, and that also has been a contributing factor to the double-digit sales growth. Credit terms offered by its main competitors are net 30-days, which conforms to general industry practices. Cape Chemical also sells using net 30-day terms, but Stewart has encouraged the firm's credit manager to take a "soft approach" when collecting past due accounts. As a result, the credit department has been slow to press past due accounts for payment. The relaxed collection effort has proven to be popular with both customers and the sales force but has resulted in a increasing number of customers paying late. To further increase sales, Stewart suggested credit standards be lowered so that more customers can qualify for credit. The credit standards were lowered two years ago and again at the beginning of the 2007. The bad debt losses experienced by the firm have not changed significantly with the less restrictive credit standards.

Case Use

The case as written includes discussion questions to aid the student in their analysis of Cape Chemical's current financial position. It also provides two schedules for the students to complete. The case can be made more difficult by omitting the discussion questions and Schedules Three and Four.

DISCUSSION QUESTIONS

James Scott, a financial advisor, has been hired by the firm's CEO, Ann Stewart, to provide assistance developing financing options, and in solving the firm's cash problems. Students are asked to assume the role as an assistant to Scott and answer the following questions.

1. Explain why it is possible for a firm to be profitable and at the same time experience cash flow problems.

Cape Chemical, like most firm's, uses an accrual accounting system to determine profits. With an accrual accounting system, not all revenues reflect cash inflows. Sales can result in accounts receivables and receivables are converted only when collected. Not all expenses represent cash outflows (depreciation expense). A firm can report a profit but not generate a positive cash flow because revenues and expenses are not cash inflows and outflows. Reported income also does not reflect the cash outflows required to obtain the assets (current assets and fixed assets) required to generate sales. Acquiring assets to support sales growth is the major cause of Cape Chemical's ongoing cash flow problem.

2. Prepare a cash flow statement for 2006 and 2007. Interpret the information provided by the cash flow statements. How has Cape Chemical been using its cash and why is additional cash needed?

(See completed Schedule Three)

A cash flow statement provides information regarding the amount and sources of cash coming into a firm for the period and how the cash was used. Inflows and outflows are divided into three categories, cash flow from operations, cash flow from investing activities and cash flow from financing activities. As its name indicates, the focus is on cash not accounting profits.

Cape Chemical's cash has been used primarily to finance increases in accounts receivables, inventory and additional fixed assets.

Cash used to finance (000's)/\$	2006	2007
Accounts receivable increase	1,700	3,042
Inventory Increase	1,376	3,532
Increase in other current assets	20	0
Increase in fixed assets	522	1,329
Decrease in accrued liabilities	32	39
Total cash used	3,650	7,942

Cash has been generated primarily from income, deprecation expense, increasing accounts payable (taking longer to pay vendors) and increasing short-term and long-term borrowings.

Cash sources (000's)/\$	2006	2007
Net income	215	554
Depreciation expense	400	491
Decrease in other current assets	0	25
Increase in accounts payable	1,000	2,637

Cash sources (000's)/\$	2006	2007
Increase in short-term borrowings	1,000	1,200
Increase in long-term borrowings	1,030	3,025
Total cash generated and borrowed	3,645	7,932

Analysis of the cash flow statements reveals that the company generated \$615,000 and \$1,045,000 in cash from income and depreciation expense during 2006 and 2007 respectively. The company used that cash plus substantially more to finance the company's asset growth. The policy of "next day delivery" service, instituted by Stewart requires the company to carry large amounts of inventory, and the relaxed accounts receivables collection policy results in large receivable balances. To efficiently handle the larger sales volume, the firm needed to purchase additional fixed assets. To finance the asset growth, the company borrowed \$2,030,000 in 2006 (\$1,000,000 short-term and \$1,030,000 long-term) and another \$4,225,000 in 2007 (\$1,200,000 short-term and \$3,025,000 long-term) from its bank. The company's vendors have also contributed financing as accounts payable increased by \$1,000,000 in 2006 and another \$2,637,000 in 2007. The bank has indicated no additional funds will be made available until the debt ratio is lowered to 50% and the times interest earned ratio is increased to at least 4.0. Although the case does not discuss the response of the company's vendors to the aging of accounts payables, it is likely the company has experienced an increase in collection calls from its suppliers and perhaps threats of eliminating the firm's credit.

The cash flow statement clearly indicates why despite increasing profitability the company continues to experience cash flow problems and has had to borrow to the limit. Students should see the benefits of the cash flow statements, and one of their recommendations should be to require the inclusion of the cash flow statement as part of the company's regular financial statement package.

What Stewart has overlooked or doesn't understand is that assets are required to generate sales and assets require financing. Cape Chemical's rapid sales growth has required a large increase in assets and additional financing. Most business startups have limited capital thus if sales grow faster than expected a capital shortage may occur. If capital is limited, a firm needs to control sales growth to avoid a cash or capital crunch.

3. Calculate the return on equity for 2005, 2006 and 2007 using the extended DuPont equation. Interpret the results. What does the equation reveal regarding the company's profitability, use of assets and sources of financing?

The extended DuPont equation is a method of calculating a firm's return on equity (ROE) by utilizing the profit margin (PM), total asset turnover (TATO) and equity multiplier (EM). The extended DuPont equation is: $ROE = PM \times TATO \times EM$. Profit margin is calculated by dividing net income (NI) by sales revenue and is a measure of how much of each sales dollar flows to the "bottom line" as profit. Both components are found on the income statement. A firm's profit margin is an indicator of how well operating costs are controlled. The TATO is a measure of how well a firm's management has used the firm's assets to generate sales and is calculated by dividing sales revenue by total assets. The TATO relates an income statement number, sales revenue, with a balance sheet
number, total assets. A company that is operating with a high the TATO generates greater sales per dollar than a firm with a lower TATO. Higher is better. A firm's equity multiplier is calculated by dividing total assets by total common equity and is a measure of a firm's financial leverage. The more debt used in a firm's capital structure, the greater the equity multiplier. The DuPont equation illustrates that a firm's ROE can be improved by increasing any one of the equation's three components.

Year	ROE	=	PM	х	ТАТО	x	EM
2005	.0265 or 2.65%	=	.0067	х	2.16	х	1.83
2006	.0436 or 4.36%	Ш	.0075	х	2.42	х	2.40
2007	.1010 or 10.10%	=	.0113	х	2.54	x	3.51

Return on equity calculated with the DuPont equation for Cape Chemical for the three-year period 2005-2007 is as followed:

The firm's ROE has steadily increased from 2.65% in 2005 to 10.10% in 2007. The firm's profit margin is relatively low although it has improved since 2005; total asset turnover and the equity multiplier continue to increase. The increasing TATO is surprising given the relative large increase in current assets. Additional analysis is required to gain a better understanding of the relationship between asset and sales growth. The company can improve its ROE by better controlling of operating costs and continued increased utilization of its assets. The firm's debt level is too high.

4. Evaluate the company's performance for 2005, 2006 and 2007 using ratio analysis. Calculate the following ratios and evaluate performance.

- Current ratio
- Accounts receivable turnover
- Average collection period (ACP) or Days sales outstanding (DSO)
- Inventory turnover using cost of goods sold in the numerator
- Inventory conversion period- using cost of goods sold
- Accounts payable deferral period
- Fixed asset turnover
- Total asset turnover
- Times interest earned ratio (TIE)
- Debt ratio
- Basic earning power
- Profit margin
- Return on assets
- Return on equity

(See complete Schedule Four)

Ratios for a single year can provide insight into a company's performance but to increase the information content of ratio analysis, ratios need to be calculated for a number of years (trend analysis). In general, analysis of Cape Chemical ratios indicates declining financial performance in almost all areas except profitability. Cape Chemical's effective use of fixed assets has more than offset the increased investment in inventories and receivables and explains the high TATO. Liquidity has declined, asset utilization is poor and getting worse, and the debt ratio has increased.

The firm needs to review its policy of using a "relaxed" collection effort to attract additional sales and the policy of carrying sufficient inventory to avoid "stock outs". A balance needs to be achieved between carrying costs and lost sales due to "stock outs". The current policy of paying its vendors late will most likely adversely affect the firm's ability to obtain credit in the future.

Comparing Cape Chemical's ratios with industry averages provided by RMA would also provide additional insight regarding performance.

5. Calculate the company's cash conversion cycle for 2005, 2006 and 2007.

- a. Use the cash conversion cycle to evaluate the firm's working capital policy.
- b. Explain the objective of inventory management. Evaluate Cape Chemical's inventory management.
- c. List the components of a firm's credit policy. Evaluate Cape Chemical's credit policy.
- d. Discuss the tradeoffs associated with working capital management.

Cash Conversion Cycle

The cash conversion cycle is a tool used to evaluate a firm's working capital management. It is the length of time between when cash leaves the company (to pay for material, services and labor) and when cash returns to the company (usually collection of receivables). The cash conversion cycle is equal to the inventory conversion period (days of inventory) plus the average collection period (ACP) or (DSO) less payables deferral period. The payables deferral period is the average length of time between the purchase of materials and services and the payment of cash for them. To effectively manage working capital, a firm will attempt to balance the cost of carrying inventory and financing receivables with the impact on sales of lower inventories and tighter credit. It must also consider the impact on its credit worthiness of paying its accounts payables late.

The cash conversion cycle for Cape Chemical increased from 46 days in 2005 to 63 days in 2007 as the firm's inventory conversion period and ACP increased. The cash conversion cycle would be even greater if the firm had not delayed its payments to it vendors and service providers.

Year	Cash Conversion Cycle	=	Inventory Conversion Period	+	Receivables Collection Period	-	Payables Deferral Period
2005	46 Days	=	36 Days	+	33 Days	-	23 Days
2006	57 Days	=	44 Days	+	43 Days	-	30 Days
2007	63 Days	=	56 Days	+	47 Days	-	40 Days

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As stated as part of the answer to question 3, the firm needs to review its policy of using a "relaxed" collection effort to attract additional sales and the policy of carrying sufficient inventory to avoid "stock outs". A balance should be achieved between carrying costs and lost sales due to "stock outs". Payment of vendor invoices also should be reviewed to avoid future credit problems.

Inventory Management

The objective of inventory management is to maintain sufficient inventory to avoid material sales loses due to stock outages and at the same time, keep the costs associated with inventory low. Inventory costs can be divided into two categories, ordering costs and carrying costs. Ordering costs, as the name suggests, are those administrative costs related to placing an order. Carrying costs are the costs incurred in maintaining inventory. Carrying costs include labor cost to receive and store an order, cost of facilities (warehouse, tanks) required to store inventory, insurance, administrative costs related to storing and accounting for inventory, inventory losses due to shrinkage, damage, obsolescence or devaluation and financing cost related to the dollars invested in inventory. Of the carrying costs, the largest is usually the cost associated with financing the inventory.

An effective inventory management system recognizes the tradeoffs associated with the cost of lost sales due to inventory shortages and inventory costs. Cape Chemical should review its current inventory policy. The case does not provide inventory cost information, but it is apparent that the current policy places too much emphasis on maximizing sales without considering the costs associated with such a policy. The inventory conversion period has increased from 36 days in 2005 to 56 days in 2007.

Credit Policy

A firm's credit policy reflects its position regarding 1) credit terms, 2) sales discounts offered, 3) credit standards and 4) collection policy. Credit terms establish the length of time customers are given to pay their invoices. In most cases, industry competition will influence a firm's credit terms. If its competitors are offering customers 30-day payment terms, a company will have a difficult time offering more restrictive terms. Sales discounts (a reduction in price if the invoice is paid faster the normal terms dictate) will also be heavily influenced by industry competition. Credit standards relate to the criteria used to establish the credit worthiness of a customer. In general, the higher the standards the lower bad debt loses and collection problems. Collection policy refers to the effort a firm places on collecting its accounts receivables in a timely manner.

As with inventory management, a firm's credit policy can impact its sales and profitability. A restrictive credit policy would reflect credit terms equivalent to or less than the industry, higher than industry credit standards and an aggressive approach to collecting receivables. A restrictive credit policy would tend to reduce the costs associated with carrying receivables. Carrying costs include financing receivables, administrative costs associated with monitoring and collecting receivables and bad debt losses. The downside to a restrictive credit policy is that in addition to reducing receivables carrying costs it also tends to reduce sales (fewer customers will receive credit and those that do may have lower credit limits). Some customers may not like the aggressive

collection effort (frequent inquires, and refusing future sales until past due invoice are paid). The inverse is also true; a relaxed credit policy will stimulate sales but will also result in an increase in receivables carrying costs.

The case indicates that Cape Chemical is successfully using a relaxed credit policy to stimulate sales, but little consideration has been given to the increased carrying costs associated with a relaxed policy. The company's Receivables Collection Period has increased from 33 days in 2005 to 47 days in 2007.

Working Capital Management

Effective working capital management requires a firm to balance the benefits of carrying high levels of inventory and receivables (higher sales) with the costs of carrying the higher levels inventory and receivables. A tradeoff is required. Cape Chemical should revisit its current approach to inventory and receivables management and recognize there are costs to its current policies and these need to be considered.

6. Based on answers to questions 1-5, summarize why the firm is experiencing cash problems? Provide your recommendations to improve the cash situation.

The firm's cash problems are the result of:

- a. Rapid sales growth
- b. A relaxed credit policy
- c. An inventory policy based on never missing a sale

Student recommendations to improve performance should include:

- a. A detailed review of operating costs in an effort to increase the firm's profit margin.
- b. A review of the firm's credit policy and in particular the "relaxed" collection effort that has allowed accounts receivables to steadily increase.
- c. A review of the firm's inventory policy.
- d. It may be necessary to limit sales growth until the firm can achieve a stronger cash position.

7. What alternatives are available to the firm to acquire the \$4,200,000 financing required to add the specialty chemical product line and finance the projected sales growth for 2008?

The case doesn't allow many options. Additional equity is not possible because of Stewart's desire not to reduce her ownership percentage. It may be possible to find another bank to replace the current lender. Finding a replacement bank will require time and is probably unlikely given the company's relatively high debt ratio (over 71% at the end of 2007) and TIE ratio (only 1.81x at the end of 2007). A more reasonable alternative would be to take a more aggressive approach to the management of its current assets. Reducing the inventory conversion period from 56 days to 33 days

(2005 level) and the DSO from 47 days to 35 days (2005 level) will "free up" enough additional financing to more than meet the \$4,200,000 needed to acquire the specialty chemical product line and projected sales growth for 2008. It would also allow the payable deferral period to be reduced.

Improving working capital management will increase the firm's ROE, reduce its cash conversion cycle as well as provide the necessary financing.

Schedule One Cape Chemical Income Statements (000's/\$)

	2005		200	2006		07
	\$	%	\$	%	\$	%
Revenue	18,675	100.00	28,675	100.00	48,845	100.00
Cost of Goods Sold	15,932	85.31	24,393	85.07	42,007	86.00
Gross Profit	2,743	14.69	4,282	14.93	6,838	14.00
Operating Expenses						
Selling	1,251	6.70	1,851	6.46	2,734	5.60
General & Administrative	1,090	5.84	1,590	5.54	2,192	4.49
Total Operating Expenses	2,341	12.54	3,441	12.00	4,926	10.09
Operating Profit	402	2.15	841	2.93	1,912	3.91
Interest Expense	210	1.12	510	1.78	1,059	2.17
Earnings Before Taxes	192	1.03	331	1.15	853	1.74
Income Tax Expense	67	0.36	116	0.40	299	0.61
Earnings After Taxes	125	0.67	215	0.75	554	1.13

Schedule Two

Cape Chemical

Balance Sheets (000's/\$)

	200)5	2006		200)7
	\$	%	\$	%	\$	%
Current Assets						
Cash	25	0.29	20	0.17	10	0.05
Receivables	1,712	19.79	3,412	28.76	6,454	33.55
Inventory	1,582	18.29	2,958	24.94	6,490	33.73
Other current assets	44	0.51	64	0.54	39	0.20
Total current asssets	3,363	38.88	6,454	54.41	12,993	67.53
Fixed Assets						
Land	590	6.82	590	4.97	590	3.07
Gross plant, property & equipmen	5,078	58.72	5,600	47.21	6,929	36.02
(less accumulated depreciation)	(382)	(4.42)	(782)	(6.59)	(1,273)	(6.62)
Net plant, property & equipment	4,696	54.30	4,818	40.62	5,656	29.40
Total fixed assets	5,286	61.12	5,408	45.59	6,246	32.47
Total Assets	8,649	100.00	11,862	100.00	19,239	100.00
Current liabilities						
Account payables	1.019	11.78	2.019	17.02	4.656	24.20
Short-term notes payables	300	3.47	1.300	10.96	2.500	13.00
Accrued liabilities	312	3.61	280	2.36	241	1.25
Total current liabilities	1,631	18.86	3,599	30.34	7,397	38.45
Long-term liabilities	2.300	26.59	3.330	28.07	6.355	33.03
Total liabilities	3,931	45.45	6,929	58.41	13,752	71.48
Shareholders' equity						
Common stock	4 500	52.03	4 500	37 94	4 500	23 39
Retained earnings	218	2 52	433	3 65	987	5 13
Total equity	4 718	54.55	4 933	41.50	5 487	28.52
	+,/10	JT.JJ	, <i>)))</i>	+1.57	5,407	20.32
Total liabilities & equity	8,649	100.00	11,862	100.00	19,239	100.00

Schedule Three
Cape Chemical

Cash Flow Statements (000's/\$) (for the year ended December 31)

	2006	2007
	\$	\$
Cash flow from operations		
Net Income	215	554
Plus depreciation expense	400	491
Increase in receivables	(1,700)	(3,042)
Increase in inventory	(1,376)	(3,532)
Decrease in other current assets	(20)	25
Increase in account payables	1,000	2,637
Decrease in accrued liabilities	(32)	(39)
Total cash flow from operations	(1,513)	(2,906)
Cash flow from investing activities		
Increase in land	0	0
Increase in fixed assets	(522)	(1,329)
Total cash flow from investing activites	(522)	(1,329)
Cash flow from financing activities		
Increase in short-term notes payables	1,000	1,200
Increase in long-term liabilities	1,030	3,025
Increase in common stock	0	0
Dividends paid	0	0
Total cash flow from financing activities	2,030	4,225
Net cash flow	(5)	(10)
Plus beginning cash	25	20
Ending cash	20	10

Schedule Four Cape Chemical			
Ratios			
	2005	2006	2007
Current Ratio	2.06	1.79	1.76
Accounts Receivable Turnover	10.91	8.40	7.57
Days Sales Outstanding (DSO)			
or Average Collection Period (days)	33	42.84	47.57
Inventory Turnover	10.07	8.25	6.47
Inventory Conversion Period (days)	35.75	43.66	55.62
Payables Deferral Period (days)	23.03	29.80	39.90
Cash Conversion Cycle (days)	45.72	56.69	63.28
Fixed Asset Turnover	3.68	5.12	7.05
Total Asset Turnover	2.16	2.42	2.54
Times Interest Earned (TIE)	1.91	1.65	1.81
Debt Ratio	45.45%	58.41%	71.48%
Basic Earning Power	4.62%	7.09%	9.94%
Profit Margin	0.67%	0.75%	1.13%
Total Asset Turnover	2.16	2.42	2.54
Return on Assets (ROA)	1.45%	1.81%	2.88%
Equity Multiplier	1.83	2.40	3.51
Return on Equity (ROE)	2.65%	4.36%	10.10%

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THE CUPBOARD IS BARE

Curtis A. Richards, Bellarmine University John T. Byrd, Bellarmine University David Collins, Bellarmine University

CASE DESCRIPTION

The primary subject matter of this case concerns an entrepreneur's investment in an established business. Secondary issues examined include both a pre-investment and a post-mortem financial statement analysis of an equity investment and how a successful entrepreneur might miss important financial clues when making equity investment decisions. The case has a difficulty level of four, appropriate for a senior level course. The case is designed to be taught in two to four class hours and is expected to require four to six hours of outside preparation by students.

CASE SYNOPSIS

This case profiles Charles "Chip" Riley, a successful entrepreneur in numerous business ventures, analyzing what went wrong with his purchase of the MHC Cabinet Company. He recently sold it at a loss from his original investment, and he was not happy about losing money. His intention is to do a thorough post mortem evaluation of what went wrong so it does not happen again! When he invested in MHC, Chip thought that the "cupboard was full" but it did not take long before he began to realize that the "cupboard was bare." Although the financial loss was only a small portion of his net worth, the situation at MHC did not make sense. Because of his previous successes in business ventures, Chip considered himself wise in the ways of investing and he wanted to understand where he went wrong in his initial analysis of the company. Based on that analysis, MHC should have been a successful investment opportunity.

This case was developed to show how a successful business experience can distort business judgment in future ventures. It is different from traditional cases that discuss successes or failures, in that it demonstrates how success in one venture can be a major influence for failure in the next venture. The case also provides students an opportunity to perform financial statement analysis both before and after a failed investment. The first part of the case illustrates how an investor might perform a less-than-complete analysis that could lead to an investment decision that proves to be wrong. The second part of the case performs a "post-mortem" to determine what was missed in the first analysis and how the new data might have influenced the original investment decision.

INSTRUCTORS' NOTES

Case Objective

The objective of this case is to provide students with an opportunity to perform financial statement analysis both before and after a failed investment. The first part of the case illustrates how an investor might perform a less-than-complete analysis that could lead to an investment decision that proves to be wrong. The second part of the case performs a "post-mortem" to determine what was missed in the first analysis and how the new data might have influenced the original investment decision.

PART ONE: CHIP'S INITIAL REVIEW OF MHC CABINET COMPANY

- 1. During Chip's initial review of MHC's operations he performed what he considered necessary financial analysis and sufficient due diligence. First, he selected industry data to compare MHC's financial results (Exhibit 2). Chip reasoned that if MHC could compare favorably to the industry, then it likely was a sound investment.
- 2. Based on the industry data in Exhibit 2, develop similar values for MHC Cabinet Company using the financial data in Exhibit 1. (Because he only had two years of data to work with, except for the percent change in sales, Chip used the two year average for the other data measures.)

Chip first considered the percentage change in year-to-year sales from 2003 to 2004 (Table 1). MHC compared very favorably to the industry (17% vs. 8%), and Chip was much impressed by that showing.

Table 1					
	MHC Cabinets	Industry			
% Change in Sales: 2003 vs. 2004	17%	8%			

Next Chip reviewed a favored set of operating percentages (Table 2). Here, MHC compared very favorably to the industry in every area except operating expenses (32% vs. 20%), which Chip saw as comparable because he viewed it as a function of economies of scale. As with sales growth, Chip was much impressed with MHC's ability to achieve results comparable to or better than the industry. His proposed purchase of an equity interest in MHC was looking better and better.

Table 2		
(Two-Year Averages)	MHC Cabinets	Industry
Working Capital (% of Total Assets)	23%	7%
Cost of Goods Sold (% of Sales)	55%	72%
Operating Expenses (% of Sales)	32%	20%
Gross Profit (% of Sales)	45%	28%
Operating Profit (% of Sales)	13%	8%
Net Income 9% of Sales)	10%	5%

Chip considered one final set of measures (Table 3). Return on assets for MHC was less than the industry (7% vs. 9%), but not much less and, again, he saw this as a consequence of economies of scale. Besides, MHC's return on equity at 21% was dazzling compared to the 11% generated by the industry. The success of Chip's investment seemed assured.

Yes, the debt to asset ratio was worrisome (70% vs. 30%), but this was a very small, very closely-held firm being compared to the much larger industry. Certainly MHC debt ratios would be much higher on average; that went with the territory. And, look at the positive financial leverage such a debt ratio produced – a 21% average return on equity!

While the worrisome debt ratio would prove prophetic, it was not a large enough red flag to stop Chip from investing in MHC.

Table 3					
(Two Year Averages)	MHC Cabinet	Industry			
Debt to Asset Ratio	70%	30%			
Return on Assets	7%	9%			
Return on Equity	21%	11%			

3. Based on this analysis, why did Chip consider MHC to be a good investment?

Clearly, based on the limited analysis that he completed, Chip saw the investment in MHC as desirable and financially profitable. This may have been based on his mistaken enthusiasm for MHC's sales growth and return on equity. After all, those values were based on very limited data. Also, Chip's decision might have been clouded by his emotional desire to get back into a successful business, particularly one that he thought he knew something about.

4. Based on this analysis, would you consider MHC to be a good investment?

Students are likely to have many different views on this question.

PART TWO: CHIP'S POST-MORTEM REVIEW OF MHC CABINET COMPANY

5. During his post-mortem review of what went wrong, Chip wondered what other red flags he had missed. Since his initial review mostly took an Income Statement approach – concentrating on operating results, which had convinced him that MHC was enjoying strong success – Chip's accountant convinced him to turn to the Balance Sheet for his answers. Hindsight reminded Chip that good operating results might not be sufficient if a firm is built on a shaky foundation.

6. Based on the industry data in Exhibit 3, develop similar values for MHC Cabinet Company using the financial data in Exhibit 1. (Because he only had two years of data to work with, Chip used the two year average for the data measures.)

Knowing that the long-term accounts had not been the primary problem, Chip focused on the current accounts – particularly the operating accounts (Table 4). The results did not compare well to the industry. The lower accounts receivable might have indicated a lack of large (and profitable) customers and/or a future slowing in sales. That slowing of sales might also be foretold by the much higher percentage of inventory. The nearly complete lack of accounts payable (only 1% vs. 18%) almost certainly indicated precious cash being used to pay suppliers too quickly, creating potential cash flows problems. The much lower balance in cash (partly the result of "overpaying" accounts payable) provided another indicator of potential cash flow problems. Chip's initial euphoria (and over confidence) in this investment may have caused him to overlook some sobering future effects that showed up on the balance sheet.

	Table 4	
(Two-Year Averages - % of Assets)	MHC Cabinets	Industry
Cash	4%	10%

Recognizing that he did not properly consider a number of important balance sheet relationships, Chip went on to analyze MHC's operating cycle (Table 5). The current ratio (6.74 vs. 1.50), at first glance, appeared outstanding. However, it is essentially an artifact of significantly higher inventory and essentially non-existent accounts payable. Further, since almost all of MHC's working capital is tied up in accounts receivable and inventory, the large current ratio does not represent good liquidity.

The number of days in accounts receivable was not totally unfavorable compared to the industry (48 vs. 40); so, this may not be a source of problems – other than those mentioned previously. However, the number of days in inventory is almost five times larger than the industry (137 vs. 28). Even adjusting for firm size, this was a most troubling discovery, and one that did not bode well for his previous expectations about sales growth. Finally, the number of days in accounts payable (13 vs. 48) suggests that payments to suppliers were much too quick – as was mentioned when discussing the size of accounts payable relative to working capital.

Bringing this together, it is clear that the MHC cash cycle (172 days) vs. that of the benchmark firm (20 days) is a significant source of potential cash flow problems lurking just beneath the surface of apparently good operating results.

Table 5					
(Two Year Averages)	MHC Cabinets	Industry			
Current Ratio	6.74	1.50			
# of Days in A/R	48	40			
# of Days in Inventory	137	28			
# of Days in A/P	13	48			
# of Days in Cash Cycle	172	20			

7. What impact might this analysis have had on Chip's original investment decision?

What Chip had not learned, until much too late, was that MHC struggled to maintain sufficient cash flows to meet its needs. That hidden danger (because of the downturn in sales and upturn in expenses that had occurred during his time with the company, and the too high debt red flag that he should have paid attention to earlier), pushed MHC over the cash flow ledge and caused Chip to lose a significant part of his investment.

8. What did Chip learn from this experience?

Students are likely to have many different views on this question.

THE FANTASTIC BRAND: A TEACHING CASE ON STRATEGIC DECISION-MAKING

Lynne A. Patten, Clark Atlanta University

CASE DESCRIPTION

The primary subject matter of this case concerns strategic decision-making. Secondary issues examined include how companies use strategic and financial objectives to make good business decisions. This case has a difficulty level that is appropriate for senior level students in an undergraduate business program. The case is designed to be taught in less than three class hours and is expected to require 2 to 4 hours of outside preparation by students.

CASE SYNOPSIS

In this case, students are challenged to make an everyday business decision using strategic decisionmaking. Specifically, students must analyze and recommend the best promotion, while making sure the promotion meets the brand's established guidelines and ensuring that it generates the maximum profit. At first this decision may seem somewhat straightforward, but making sure the decision meets all of the established guidelines and brand objectives may challenge some students. That's because students will need to select the appropriate promotion by evaluating the promotional programs, brand guidelines, available product sizes, trial estimates, redemption rates and product contribution margins to ensure they recommendation the best promotion for the Fantastic Brand.

This is a practical case based on a real-life scenario. Managers are faced with decisions on how to spend or allocate company resources everyday. It is important that managers ensure that all of the activities result in the resources being used effectively and efficiently. In order to do this, companies need to have established guidelines and objectives that are used by managers when making everyday decisions that utilize company resources. This can be accomplished by implementing an effective strategic management framework that can help an organization provide clarity, align employees to organizational objectives and improve decision-making. Overall, this case provides a straight-forward example on how using strategic decision-making can help managers to make good business decisions.

INSTRUCTORS' NOTE

Using the case analysis method can be an effective way to address or improve course outcomes. With so many different concepts and theories being presented in a typical course, it can sometimes be difficult for a student to comprehend all of the course content. In order to successfully analyze and present a case, it is generally necessary for students to incorporate more than one concept. Therefore, using the case analysis method can help students bring together more than one concept being presented in a course. Even for students who do well on tests, this method can help to improve their overall level of comprehension because

this approach involves applying course concepts to real-life scenarios. Ideally, this case will be used in an undergraduate Business Policy course. That's because this case requires a basic level of business knowledge in order to understand the case and complete the analysis.

This case is designed to help students better understand how complex decision-making can be in reallife. The focus is on how using strategic management can improve decision-making and help companies achieve organizational objectives. Rarely are companies faced with decisions that are clear-cut and easily made. In most situations, there are a variety of factors that need to be considered. Strategic management provides a framework that can help an organization achieve its objectives and move closer towards its vision. In real life, companies have to balance strategic concerns, like developing an effective strategy, consumer satisfaction, market share, and image with financial concerns like, revenues, costs, and profit. This can often be a daunting task. To deal with this complexity, many successful companies use a strategic management approach, which helps to improve decision-making at all levels in the organization. In this case, students should gain a better understanding of real-life decision-making for corporations. At the end of this case, the following outcomes should have a better understanding of (1) strategic management, (2) how to use strategy and objectives when making business decisions and (3) the complexity associated with decision-making in today's business environment.

Group Case Requirements

Depending on the class size, this case should take no more than two class periods to complete. One class session should focus on preparing students to analyze the case and the second class session should be dedicated to in-class presentations. Students should be divided into groups and each group should analyze the case and present a recommendation that addresses which products and program Jennifer should recommend to her manager, Troy. In some cases, it is also beneficial to require a written report along with the presentation because this can help students to develop their writing skills. However, the focus of this case is more analytical. Therefore, there is less emphasis on writing and more emphasis is placed on analyzing data and communicating the results in a professional, coherent, and actionable manner. Please see the discussion below, which details the suggested activities for this case.

First Class Session

The first class session should be focused on ensuring that students are equipped with enough information to successfully complete the case. Specifically, this class period should primarily be focused on ensuring that students understand the relevant business terms and requirements for this case. First, students need to have an understanding of the relevant business terms and concepts for this case. Therefore, some class time should be dedicated to the following:

- Ensuring that students understand the difference between strategic and financial objectives.
- Ensuring that students understand the key business terms in this case like market share, SKUs, trial estimates, product contribution margin, etc.
- Ensuring that students have a basic understanding of how to use data when making business decisions.

In addition, students should also be put into groups and provided with a copy of the case. After providing the students with a copy of the case, it can also be beneficial to discuss the major issues in this case and review the requirements for this case. Creating a 1-page overview with the requirements for the case and distributing it to students can help to ensure that they are clear on the expectations for the assignment. The overview can include information on due dates, formatting, presentation guidelines, grading criteria, etc. This will ensure that students have the appropriate framework to complete the assignment. It also helps to provide direction and prevent some students from heading down the wrong path. This discussion is not intended to provide a lot of detail regarding the case, but it should be focused on ensuring that students understand the case and expectations for this assignment. After this class session, students should have a clear understanding of the case, the major issues in the case, how to approach the case, and how the case will be graded.

Second Class Session

One week later the groups should have completed the analysis and be prepared to present their recommendations. Allowing one week for the case analysis and preparation should be sufficient. Since the students do not need to conduct research, this should be enough time for students to meet, analyze the case, and develop the presentation. However, this approach does require the students to work effectively within a group. The students will need to collaborate with one another or the assignment may be difficult to accomplish.

The focus of the second class period is to have students present their case analysis in front of the class. Have each group give a presentation on which products and program Jennifer should recommend to Kevin. The groups will need the appropriate classroom equipment like a laptop, overhead projector, etc. In addition, students should be dressed in business attire. This helps to develop a sense of professionalism.

Finally, the groups should be prepared to answer any questions from the instructor and their classmates regarding the presentation. This is an opportunity to provide quality feedback to each group, discuss concepts or key issues that were not addressed in their presentations, and help students to develop their ability to think on their feet.

DISCUSSION QUESTIONS

1. What program should Jennifer recommend to Kevin? Should it be the sampling or coupon program? What products/SKUs should be used in the program? What criteria should be used in the decision-making process?

This question will require students to select the products/SKUs before they can recommend a program. This is necessary because each SKU has a different set of characteristics and the brand strategy must be taken into account. In this situation, the best products for this promotion are the 12oz. shampoo and 10oz. conditioner. When these products are used to determine which program Jennifer should recommend, the coupon program is by far the best investment of the \$200,000 in incremental funding. Please see below for a detailed discussion.

Product Selection

At first, it may be tempting to select the sizes with the highest contribution margins to use in the promotion. This might be inviting because these products will generate more profit for every bottle that is sold. However, in this case, the products with the highest contribution margins have lower market share and are estimated to generate less trial. Therefore, these products would likely generate much less income for the brand. For example, the 14oz. shampoo has a higher contribution margin than the 12oz. shampoo, but the 14oz. shampoo would generate less income because the trial estimate is much lower than the 12oz. shampoo. Specifically, the 14oz. shampoo is estimated to generate \$43,600 in income from the coupon program and \$49,050 from the sampling program, while the 12oz. shampoo is estimated to generate \$123,750 in income from the coupon program and \$128,700 from the sampling program. In both programs, the 12oz. shampoo has higher trial estimates and when combined with good contribution margins, this product generates more income than the 14oz. shampoo. Please see Table 6 for details.

Table 6: Example of Estimated Profit and Loss for Products					
Program Information	Shampoo - 12oz.	Shampoo - 14oz.			
Coupon Program					
-Est. New Trial	125,000 units	40,000 units			
-Product Contribution	\$0.99/unit	\$1.09/unit			
-Income Generated	\$123,750	\$43,600			
Sampling Program					
-Est. New Trial	130,000 units	45,000 units			
-Product Contribution	\$0.99/unit	\$1.09/unit			
-Income Generated	\$128,700	\$49,050			

Let's not forget, the brand strategy states that all promotional activities should include a shampoo and conditioner. More specifically, the brand strategy requires that all brand promotions include the 12oz. shampoo and 10oz. conditioner unless a strong case can be made to use another product. In addition, the 12oz. shampoo has the highest market share on the brand, while the 10oz. conditioner has the second highest market share on the brand and the highest market share among the conditioners. This indicates that these are the best selling SKUs on the brand. The 12oz. shampoo and 10oz. conditioner are clearly the best products to use in either promotion. Although there are other products on the brand with higher contribution margins, these SKUs have good profit margins, the highest market share on the brand, the highest estimated trial in both programs, and they adhere to the brand strategy.

Program Selection

The program that meets the brand strategy and is within the budget allocation is the coupon program. Therefore, Jennifer should recommend the coupon program. The sampling and coupon vendors are both able

to feature the 12oz. shampoo and 10oz. conditioner in the promotion and have provided trial estimates for these products. Therefore, both programs are able to meet the brand strategy.

However, the sampling program is too expensive, as it exceeds the original allocation. Remember, the budget is \$200,000. Since the minimum order for the sampling program is 300,000 units and each sample costs \$.96/unit to distribute, the total cost of the sampling program is estimated to be \$288,000. This is \$88,000 more than the \$200,000 in incremental funding allocated to the Fantastic brand. But, the coupon program follows the brand strategy and is within the budget constraints. The total cost of the coupon program is estimated to be \$181,250, which includes \$100,000 for the coupon program, \$31,250 in redemption costs for the shampoo coupon and \$25,000 in redemption costs for the conditioner coupon. The estimated total cost of the coupon program is \$18,750 less than the \$200,000 allocation. Although it may be tempting to recommend the sampling program because it is estimated to generate more trial, it is too expensive. The budget allocation is a real constraint. Please see Table 7 for a review of the costs for each program.

Table 7: Budget and Program Information				
Program Information	Sampling Program	Coupon Program		
Brand Guidelines	ü	ü		
Within Budget Allocation	X ü			
Budget Details				
-Cost of Program	\$288,000	\$181,250		
-Budget Allocation	\$200,000	\$200,000		
-Under (Over) Budget	(\$88,000)	\$18,750		

Overall, Jennifer should recommend that the \$200,000 in incremental funding be used on a coupon program that features the 12oz. shampoo and 10oz. conditioner. This recommendation adheres to the brand strategy and is within budget.

2. Are these programs estimated to lose money, break-even or generate a profit? Which program is the best investment? What criteria should be used to determine whether or not these programs are a good investment?

Once again, the coupon program is the best program. That's because the coupon program actually generates a profit and is more efficient at obtaining additional trial than the sampling program. Not only is the sampling program not a good investment because it is over budget, it doesn't generate a profit and is less efficient at gaining trial than the coupon program.

First, the coupon program generates a profit, while the sampling program does not. The estimated cost of the coupon program is \$181,250 and is expected to generate 225,000 units in new trial, while the estimated cost of the sampling program is \$288,000 and is expected to generate 235,000 units in new trial. Therefore, the coupon program is expected to generate \$222,750 in income, which pays for the cost of the program and contributes \$41,500 to profit. However, the sampling program is expected to generate \$232,650 in income, which does not pay out the program.

Table 8: Profit and Loss for Programs					
Program Information	Sampling Program	Coupon Program			
Estimated New Trial					
-Shampoo - 12oz.	130,000 units	125,000 units			
-Conditioner - 10oz.	105,000 units	100,000 units			
Total Estimated New Trial	235,000 units	225,000 units			
Product Contribution Margin	\$0.99/unit	\$0.99/unit			
Estimated Product Contribution					
-Shampoo - 12oz.	\$128,700	\$123,750			
-Conditioner - 10oz.	\$103,950	\$99,000			
Total Expected Product Contribution	\$232,650	\$222,750			
Cost of Program	\$288,000	\$181,250			
Expected Profit (Loss)	(\$55,350)	\$41,500			

The brand would lose \$55,350 on the sampling program. For details regarding the profitability of the programs, please see Table 8.

Similarly, the coupon program is a more efficient way to spend the incremental funding. The coupon program is estimated to cost \$181,250 and generate 225,000 trial units, which makes the estimated cost per unit \$0.81. However, the sampling program is estimated to cost \$288,000 and generate 235,000 trial units, which makes the estimated cost per unit \$1.23. This makes the sampling program \$0.42/unit more expensive than the coupon program, which means the coupon program is a more efficient way to gain new trial. Although coupon program is estimated to generate slightly less trial, it is more efficient than the sampling program. Please see Table 9 for a review of the estimated unit costs for each program.

Table 9: Cost Per Unit for Programs				
Program	Sampling	Coupon		
Information	Program	Program		
Estimated New Trial	235,000 units	225,000 units		
Cost of Program	\$288,000	\$181,250		
Cost/Unit	\$1.23	\$0.81		

As stated previously, the coupon program is the best investment of the \$200,000 in incremental funding. It meets the brand strategy, adheres to the budget constraints, generates a profit and is the most efficient program.

3. What are some advantages and disadvantages of using strategic management? Does this approach improve or hinder decision-making?

In general, using a strategic management approach can be extremely beneficial. When companies are able to successfully implement a strategic management process, it can help to improve the overall effectiveness of the organization. In 1972, the term "strategic management" was introduced by Igor Ansoff (Hussey, 1999). In his article called, "*The Concept of Strategic Management*," Ansoff (1972) states,

"The strategic management activity is concerned with establishing and maintaining a set of relationships between the organization and the environment which (a) enable it to pursue its objectives, (b) are consistent with the organizational capabilities, and (c) continue to be responsive to environmental demands" (p.5).

Strategic management has been adapted by many successful companies. Watson (2005) stated, "...organizations that achieve their goals in the long term plan their work and work their plan" (p. 4). One of the main advantages of strategic management is having clearly stated objectives, which allows the company to focus on both the strategic and financial needs of the organization. However, there can be some disadvantages like having to create and maintain a complicated process that can often be time consuming.

Advantages

Although all of the advantages can't be discussed in this manuscript, two important advantages of using a strategic management approach are (a) the use of established objectives and (b) balanced decision-making. Using a strategic management process can make analyzing potential programs, activities, and opportunities more focused and well-thought out. If the decision-maker knows the criteria upfront, the decision can be made based on the established criteria, which reduces the subjectiveness in the process. Without established objectives, the decision-maker can sometimes be guided by factors that are not directly linked to the company's strategies and objectives. Some programs can be very attractive in one regard, while not very attractive in another. If the decision-maker puts more emphasis on one factor, like trial generated, and doesn't base their decision on more than one relevant factor, like trial, budget constraints and profit, then there is a greater chance of making a poor decision. The end result could mean investing in a program that doesn't help move the organization forward or closer towards its vision.

Another advantage of using a strategic management approach is that it helps to provide a balanced framework for decision-making. The benefit of using both strategic and financial objectives is that it helps to ensure that programs and activities will help the organization to (a) grow and be

competitive and (b) meet the financial objectives and goals of the company. If there is too much focus on the strategic priorities without enough concern for the financial objectives, the company could jeopardize its long-term financial stability. Likewise, if a company is too focused on financial objectives and doesn't properly account for the strategic side of the business, the long-term sustainability of the company could be at risk. When a decision-maker accounts for both strategic and financial objectives, the company is more likely to be in a better overall position. This approach can help to ensure that programs not only develop competitiveness, but also generate the necessary profit. Too often, companies have become unbalance because of short-term gains or lack of appropriate strategic focus and have suffered a loss of sales, revenues, customers, etc. Although the process is not fail proof, using strategic management has been shown to be an effective business approach.

Disadvantages

This does not mean that strategic management is a perfect process. Although there are some real advantages to this process, there are also some realistic challenges. The main disadvantage associated with this process is that it requires a tremendous amount of time, energy and resources. Developing, implementing, and maintaining a strategic management process tends to be a complex and costly venture that requires a great deal of organizational commitment.

One of the most difficult aspects of using a strategic management approach is developing and maintaining the appropriate infrastructure, which can require a lot of resources. As Ansoff suggested (1972), an important aspect of the strategic management process is establishing and maintaining relationships. In order to do this, there needs to be a system in place that allows for coordination between the internal departments and external constituents. This can be challenging because it calls for a tremendous amount of collaboration and communication, which can sometimes be an expensive endeavor. It is not uncommon for companies to invest millions of dollars into developing and managing the appropriate infrastructure.

Once the systems and relationships are in place, it is also necessary to generate and analyze the data to be used in the decision-making process. This can require interacting with several departments, accessing numerous reports, and contacting reliable people to gather the appropriate data. In today's fast paced business environment, it can take time to generate the necessary data, analyze the data, and ensure that the decision is aligned to the organizational strategies and objectives. Even for the most strategic companies, managing this type of process can be timely and require a lot of resources.

Strictly adhering to the process can sometimes be unrealistic for some organizations. As a result, many organizations use strategic management principles when making decisions. Companies may not have a full set of data or the optimum coordination, but the use of established objectives that are based on organizational needs is becoming more prevalent everyday. That's because this approach can help to ensure that a company's programs and activities are more likely to be successful, which can help a business to sustain itself overtime. Strategic management can be complex and require a lot of resources, but this approach can greatly improve decision-making and help a company to achieve its objectives and move closer towards its vision.

CONCLUSION

The case analysis method can be very helpful in the learning process because it helps students to apply concepts learned during the course to real-life scenarios. This can help to reinforce information presented during class and provide students with another opportunity to grasp the course concepts. In this case, students get exposed to strategic management by analyzing real life strategic decisions that companies have to make everyday. After completing this case, students should have a better understanding of why it is important to make decisions using data, how a company can achieve its strategic and financial objectives, and how strategic management can lead to the long-term sustained health of the company.

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THE RETIREMENT CASE OF PROFESSOR PAUL

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CASE DESCRIPTION

The retirement of Professor Paul is a case that I have utilized in my FINA 464 – Retirement Planning course with a lot of success for the last two years. It is a case that is geared for junior and senior level finance students, although it could be used in any course that teaches financial analysis using Excel.

CASE SYNOPSIS

This case deals with the retirement plans of Professor Paul. Professor Paul is a composite of many of my faculty colleagues who I have encountered during my teaching career. He has been diligently planning for his retirement and believes that he that he has amassed sufficient assets to enable him to retire early and comfortably. An analysis of his situation using a retirement income planning model that I have developed indicates that he is very wrong!

INSTRUCTORS' NOTES

Objectives of the case

Upon completing this case, students will be able to:

- 1. Utilize and understand a comprehensive retirement income planning model
- 2. Have a comprehensive introduction to and understanding of the time value of money functions in Excel
- 3. Understand the importance of key assumptions in financial planning in general and retirement planning specifically
- 4. Allow students to consider and evaluate various options for solving a financial problem.

The methodology that I use is to assign the case after I teach that the basic format of the analysis. I expect the students to spend about three hours outside of class reading the case (which is not long) and considering and analyzing the various options that they believe are worth considering. In the following class we discuss the advantages and disadvantages of the options that the students have come up with. After discussing their options for about an hour I present the analysis that I did (this is contained in the Excel file

that accompanies this case). After viewing that various options, I present a possible solution and we discuss the tradeoffs involved with that.

DISCUSSION QUESTIONS

1. Will Professor Paul be able to retire in the way that he intends on his existing retirement resources? Develop a retirement planning spreadsheet to determine whether he can retire the way that he plans. Explain what assumptions need to be made in order to complete this analysis and justify the assumptions that you make.

In order to complete this analysis one must make assumptions concerning:

Inflation Rate of return Withdrawal rate Life expectancy

The assumptions that were made and the rational for each of those are below:

Inflation	The average inflation rate for the last 50 years has been about 4%. For this reason we will start our analysis assuming a 4% inflation rate.
Rate of return	The long-term return for equity has been 10-12% and the long-term return for bonds has been 5-6% (Ibbotson Data). Assuming an asset allocation of 50% bonds and 50% equity, this would imply a portfolio return of 8.25%. In order to be conservative we will assume a 7% return.
Withdrawal	
rate	There has been a lot of research on portfolio sustainability recommending that initial withdrawal rates start at 4-5% and then adjust for inflation thereafter. We will assume a withdrawal rate of 5% for this analysis.
Life	
expectancy	Using a standard mortality table would result in 50% chance of living beyond the stated date; this is not acceptable. As a result many financial planning professionals recommend a life expectancy of 90-100. We will use a life expectance of 95 years in doing this analysis

The spreadsheet that shows the original retirement plan of Professor Paul is contained in Appendix A. It shows that his present retirement plan **will not work**. It results in a deficit in every single year of his projected retirement.

2. If Professor Paul's existing retirement plan does not work, what options can he consider. Develop multiple retirement planning worksheets to show the impact of these various options. Professor Paul has many options that he can explore; they will be listed below and analyzed individually in the noted appendixes. After each option is explored in isolation, we will consider using a combination of options in making our recommendation.

Options that Professor Paul can consider:

- 1. He can increase his contributions to his retirement accounts Appendix B
- 2. He can assume a higher rate of return on his investments Appendix C
- 3. He can assume a lower rate of inflation Appendix D
- 4. He can assume a higher withdrawal rate Appendix E
- 5. He can stay in the phased retirement plan longer than 3 years Appendix F
- 6. He can enter the phased retirement plan after age 55 Appendix G
- 7. He can work during retirement Appendix H
- 8. He can delay taking Social Security in order to earn a higher benefit Appendix I
- 9. He can reduce his planned expenses in retirement- Appendix J
- 10. He can use a combination of the above options Appendix K

Analysis of options:

Each of these options comes with its own combination of advantages and disadvantages. Each of the options will be examined below by discussing the advantages and disadvantages of each one.

Option #1 Increase contributions to retirement accounts (Appendix B)

Recent changes in the tax laws (the Economic Growth & Tax Reconciliation Act of 2001 - EGTRRA 2001) allow Professor Paul to increase his contributions to his retirement account. He can increase his contribution to his 403 (B) to \$22,000 in 2009 because he is over 50. He can also increase his contribution to \$6,000.

Advantages:

- 1. He would be taking maximum advantage of his ability to save for retirement, reduce his taxes and maximize tax deferral.
- 2. Given that he is single and his mortgage is almost paid off he may be able to accommodate this increased investment into his budget

Disadvantages:

- 1. Given that he is only planning to work full time for one more year, this will provide minimal improvement
- 2. Under this option he still has deficits in each year..

3. This option alone will not provide nearly enough improvement to allow him to retire comfortably.

Option #2 Assume a higher rate of return on his investments (Appendix C)

Professor Paul's assumed rate of return of 7% is a bit conservative. If he invests a little more aggressively (more equities) he may be able to increase this to 8%.

Advantages:

- 1. Earning a higher rate of return will allow his money to work harder for him
- 2. He will not have to increase his contributions to his retirement plans and can therefore spend more in the present time

Disadvantages:

- 1. In order to earn a higher rate of return he will have to assume more investment risk; this may be inappropriate at this point in his life
- 2. This option does not make a large enough positive impact on his retirement plan; he still has a deficit in each year of retirement..
- Option #3 Assume a lower rate of inflation (Appendix D)

Professor Paul can assume a lower rate of inflation. Although the average inflation rate has averaged 4% for the last 50 years, inflation has been lower recently. The average inflation rate for the last ten years has been 2.38% and the average rate for the last 20 years has been 3.05%. This causes some planners to build a 3% inflation assumption into their retirement plans. Also while Professor Paul can not impact the CPI, he can certainly impact his own personal inflation rate to a degree.

Advantages:

- 1. This will cause his total retirement expenditure to reduce from 6.2 million over his lifetime to 4.8 million
- 2. He no longer has a deficit in every single year of retirement and his shortfall reduce by about 50%. This illustrates that the rate of inflation assumed has a <u>huge impact</u> on the analysis. Assume too high a rate and you penalize the short term for the benefit of the long term. Assume too low a rate and you can enjoy a higher standard of living in the short term but you assume more risk in the long term. This requires a careful balancing act.
- 3. He will not have to assume more investment risk or increase his retirement contributions

Disadvantages:

- 1. While Professor Paul can <u>assume</u> a lower rate of inflation, he cannot really <u>cause</u> a lower rate of inflation. All he can do is limit the increase in his expenditure to 3% from year to year.
- 2. To the extent that he limits his increases in expenses to less than the rate of increase in inflation, his standard of living may be diminished over time.

Option #4 assume a higher withdrawal rate (Appendix E)

Professor Paul can take a larger withdrawal from his retirement nest egg each year. The danger is that if he withdraws at too high a rate then he runs the risk of running out of money. Jonathan Guyton in a October 2004 article in the Journal of Financial Planning) maintains that one can safely withdraw approximately 6% per year if they keep a higher portion in equities (approximately 80%), limit inflation adjustments to CPI or 6% whichever is lower and to not take inflation adjustments after years when his portfolio declines.

Advantages:

- 1. Professor Paul can enjoy a higher standard of living from his retirement nest egg
- 2. He generates surpluses in three of the 40 years (ages 62-64)
- 3. His shortfalls are all reduced.

Disadvantages:

- 1. Professor Paul will increase the chance that he will run out of money. If he uses the higher withdrawal rate in conjunction with annuitizing a portion of his portfolio, this will be less critical
- 2. If he has the misfortune of having some poor investment years early in his retirement, this increased withdrawal rate will compound the problem

Option #5 stay in the phased retirement program for 5 years instead of 3 years (Appendix F)

In his original plan Professor Paul assumed that he would stay in his College's phased retirement program for three years. However, he can stay for five years. Given that he still enjoys his job, we will look at the impact of him staying for 5 years.

Advantages:

- 1. This option will allow Professor Paul to work longer, contribute longer and delay tapping his retirement accounts for an additional two years.
- 2. This will allow Professor Paul to withdraw more from his 403 (B), IRA and taxable retirement accounts

3. This option reduces some of his shortfalls.

Disadvantages:

1. He will still have deficits in 37 of his 40 years of retirement

Option #6 enter the phased retirement program after age 55 (Appendix G)

Professor Paul can choose to enter the phased retirement program (PRP) any time after age 55. For the purpose of analyzing this option we will assume that he decides to teach full time for an additional 3 years (until age 58) and then enter the PRP for three years

Advantages:

- 1. This will allow Professor Paul to continue to earn his full time salary for an additional three years
- 2. The will allow him to leave him retirement accounts untouched for three more years
- 3. The will allow him three additional years to contribute to his retirement accounts
- 4. This option reduces the amount of his deficit

Disadvantages:

- 1. This option will delay his entry into retirement for three more years
- 2. The shortfalls are still very significant
- Option #7 he can work during retirement (AppendixHI)

Professor Paul can consider working during retirement. A recent survey by AARP revealed that about 80% of Baby Boomers intend to work during retirement (at least part time) and that the majority of those who responded that they intended to work intend to do so whether there is an economic need for the money or not.. The must realize on some intuitive level that there are psychological (self worth) and social (connecting) reasons to work in addition to the economic motive (the paycheck). Because Professor Paul still enjoys teaching he is willing to consider teaching 2 courses a year (either one each semester or teaching two courses one semester and taking the other semester off). He feels that he can earn \$10,000 per year doing this. He is willing to consider doing this for ten years after he exits the phased retirement system at his college.

Advantages:

1. Professor Paul can continue to teach for an additional ten years. This will allow him to continue to do something that he enjoys at a less strenuous pace

- 2. Continuing to teach part time will provide some structure to his time and allow him to remain connected to a social network, the faculty of the school where he will teach.
- 3. This will reduce the deficits in the ten years that he will teach part time.
- 4. This reduces his shortfall.

Disadvantages:

- 1. He will continue to work for an additional ten years. He may not view this as a disadvantage.
- 2. He must exercise caution to not reduce his future Social Security benefits once he begins collecting them. Given the amount that he intends to work, this will probably not be a problem

Option #8 He can delay taking Social Security until his full retirement age (Appendix I)

Professor Paul will have his Social Security Retirement Benefits permanently reduced if he takes them prior to his full retirement age (66). If he waits until age 66 to take them he will increase his first year benefits from \$17,000 to \$22,500.

Advantages:

1. Delaying taking Social Security retirement benefits is a "longevity bet". If Professor Paul lives long enough taking the higher benefits for a reduced number of years (4 in this case) could result in greater total benefits over his lifetime. He should consider the longevity of his ancestors and the state of his health in making a decision on this

Disadvantages:

- 1. If Professor Paul does not live long enough he will actually reduce his total lifetime benefits by waiting until age 66 to start taking them. It is probably for this reason that the must popular age to take benefits is age 62.
- 2. This option more shifts the problem than reducing it. It makes the deficits in years 62-65 worse and the deficits after that better.
- Option #9 reduce planned retirement expenses (Appendix J)

Professor Paul plans to maintain his same level of spending in retirement. Many people who study retirement maintain that a person can maintain the same standard of living in retirement at 70-80% of their pre-retirement expenses because more expenses decrease (work related expenses, FICA contributions, etc) than increase. If Professor Paul wishes to examine this issue in more depth, Dr. Bruce Palmer's who heads up the RETIRE Project at Georgia State has written a lot about the issue

of replacement ratios. For the purpose of this analysis we will assume that Professor Paul can reduce his expenses by 15% to 85% of his pre-retirement expenses.

Advantages:

- 1. This level of expenses may more accurately project the level of retirement expenses experienced by the typical retiree.
- 2. This option reduces the level of deficits, particularly in the early years of his retirement.

Disadvantages:

- 1. Professor Paul will have to reduce his level of retirement spending; this may constrain his spending more than he is willing to.
- 2. The cumulative deficit that remains is still substantial.

Recommendation Option #10 – use a combination of the above options (Appendix K)

The recommended option will be a **combination** of some of the options considered above; the specific options that will be utilized will be to:

- 1. Delay entering the phased retirement program until age 58 (Appendix G)
- 2. Increase his retirement contributions (Appendix A)
- 3. Remain in the phased retirement program for 5 years instead of three (Appendix F)
- 4. Work part time during retirement (Appendix H)
- 5. Reduce his planned retirement expenses (Appendix J)

Rational for recommended option:

There are several justifications for the recommended option, which can by divided into two main groups. The first group will consist of the reasons why various options were rejected in our recommendation. The second group will consist will consist of the reasons why the recommended options were included.

Options that **were not included** in the recommendation and the rational for not including them:

Option #2 investing for a higher rate of return was not included in the recommendation because higher risk comes with higher return. Professor Paul is a stage in his life where he cannot afford to be inappropriately aggressive. If the only way that he can afford to

take early retirement is to take on inappropriate risk then he probably cannot afford to retire early

Option #3 assuming a lower rate of inflation was not included because this factor is essentially out of his control and it is not wise to build a retirement plan on assumptions that one cannot control. Even though inflation has been benign in recent years (averaging 2.38% over the past 10 years and 3.05% over the past 20), he cannot plan on this continuing over the long term. It is safer to assume that inflation will move forward at its 50-year average of 4%. True he can adjust his variable expenses if inflation rises faster than planned but he should use this option only as a margin of safety.

- Option #4 assuming a higher withdrawal rate was not included because increasing the withdrawal rate above 5% is too risky. Granted, the article that advocated a withdrawal rate in the 6% range was based on the period from 1970-2004, which included 2 terrible stock markets, but it also included the greatest sustained bull market in history. More back testing on multiple time frames and Monte Carlo simulations would have to be done before I would be comfortable recommending a withdrawal rate above 5%
- Option #8 delaying taking Social Security Retirement Benefits was not included because Professor Paul was not comfortable making the "longevity bet". He recounted reading that in order to justify taking full retirement benefits at 66 he would have to live about a dozen years beyond that date (until about 78) in order to make the "longevity bet" pay off. Given all that, he has been reading about Social Security, he is more comfortable taking benefits as early as he can and then delaying hitting some of his retirement accounts for later. Plus at the level he plans to work in retirement, he will not lose any of his benefits.

Options that were included and the rational for including them:

Three of the options selected involve Professor Paul working longer; they were:

- Option #6 entering the phased retirement program at age 58 instead of age 55
- Option #5 remaining in the phased retirement program for five years instead of three years
- Option #7 working part time for the first 10 years of his retirement

There are a numbers of factors that justify these three options involving working longer. First Professor Paul still enjoys his work. He is not so much retiring <u>from something</u> as he is retiring to <u>something</u>. This arrangement will allow him to continue the work that he enjoys and continue to reap the economic, psychological and social benefits associated with it but still begin to enjoy his new post retirement life. He may view this combination as more desirable than either option in isolation! The second reason is that Professor Paul, like many people planning for retirement, has simply underestimated how many assets need to be in place to retire comfortably, especially if one plans to retire early. The combination of longer life expectancies and early requirement requires that very substantial assets be in place. What Professor Paul considerer "significantl" retirement assets were

simply insufficient to allow him to retire early (see Appendix A). Third, Professor Paul has probably underestimated the value of employer funded health insurance program. If he were to enter the phased retirement program at 55 and exit it at age 58, he would have to provide his own health insurance for seven years until he was eligible for Medicare. This could prove to be very expensive. Finally by continuing to work longer his retirement assets were able to grow dramatically. This was due to a combination of factors. He was able to contribute longer because he was working longer (entering the phased retirement program at 58 instead of 55 and remaining in it for five years instead of three years) gave him five more years of contributions. Just as important however was the fact that he was able to leave his existing retirement assets untouched longer and they grew dramatically. Under his original retirement plan he was planning on drawing from his 403(b) and his IRA at age 58 under this recommendation, he does not need to draw on them until age 65. In conclusion, these three options associated with working longer are the foundation of a workable retirement plan. Professor Paul goes from a projected cumulative deficit of over 2.5 million dollars under his original plan, to having a projected surplus!

This recommendation also calls for Professor Paul to more fully fund his retirement accounts. It only makes sense to take advantage of the increased ability to fund retirement (and the increased tax shelter) associated with the tax act of 2001 (the Economic Growth & Tax Relief Reconciliation Act –EGTRRA). The impact of this options is limited be the fact that these increased contributions will only take place for a short period of time (5 additional years) but they do play a role.

The option that Professor Paul may have the most difficulty accepting is to reduce his projected retirement expenses 15%. He may feel that he has worked his entire career and he has earned the right to retire as he chooses. A number of factors may allow him to view this option in a more favorable light. First, his FICA taxes will reduce dramatically in retirement, eventually to zero, because it is a payroll tax not an income tax. This factor will eventually decrease his expenses by about 7% - about half the recommended reduction. Second, if he moves to a state that is more tax friendly to retirees (and many states are launching concerted efforts to make themselves attractive to the Baby Boom generation that will be retiring shortly) other taxes (income, sales, property) could likely decrease as well. This second factor in combination with the first factor could account for all of the recommended 15% reduction. Finally because he now has a cumulative surplus, he will not have to reduce his expenses as much as originally projected. Also because the early years of his retirement are marked by significant surpluses, he will not have to hit retirement accounts as much as projected allowing him to spend more in the later years. Over the early years of his retirement Professor Paul will have to "develop a feel" for how much he needs to reduce his expenses. This could involve something as simple as "tightening his belt" by constraining some discretionary variable expenses a little after years of poor investment performance and "giving himself a bigger raise" following good years.

It is possible to view that recommendation as the best of both worlds. It will allow Professor Paul to retire early and beginning to enjoy the life style that he desires. It also allows him to continue to enjoy his present life and all the social, psychological and economic benefits that it provides. Like many people of his generation Professor Paul may come to find that the artificial separation between work life and retirement is arbitrary and undesirable. He may find that a continuum of work and leisure which allows him to gradually adjust from work to retirement is much more desirable.

3. What other retirement planning issues does Professor Paul need to consider?

There are a number of issues that Professor Paul needs to consider.

First he needs to realize that he has to consider not just the amount that he can withdraw but he must also consider the order that he withdraws from his retirement accounts. As a general rule it is advisable to withdraw from taxable accounts in order to allow the tax deferred account to continue to grow for as long as possible. A study done by T. Rowe Price has shown that withdrawing retirement funds in the right order can add years to a retirement portfolio compared to withdrawing funds in the incorrect order.

A second issue that he needs to consider is health care expense during retirement. For many retirees, this is one of their largest budget categories. The issue is compounded by that fact that many employers are reducing their contributions to retire health care. Professor Paul should consult with his human resource department in order to determine what his retire health care benefits will be. He needs to be certain that he is incorporating the most accurate figures possible into his retirement projections.

Once Professor Paul comes up with a retirement plan that is economically feasible. He needs to be sure that he is ready to retire in a psychological and social sense as well. Many people, who have adequate retirement resources, find their retirement experience unsatisfactory because they are not psychologically or socially ready to retire. Many people get a large degree of satisfaction and a large "sense of self" from their jobs. Some will ask "Who am I when I no longer...?". Also many people fail to consider how much of their social network is associated with their jobs. Do they have an alternate social support system ready to replace the one that they will be leaving at work? Fortunately, for Professor Paul, his phased retirement plan will allow him to retire slowly and as a result he can ease into the necessary psychologically and social adjustments.

4. Professor Paul is considered about all of the news concerning Social Security. How will likely future Social Security reforms impact Professor Paul?

Social Security is facing a huge demographic challenge with the impending retirement of the Baby Boomers. This will force the revamping of Social Security (it was last reformed in 1983). The likely changes will be some combination of reduced benefits, increased taxes, a possible modification of the cost of living adjustment (COLA) and the continuing pushing back of the retirement age. Due to Professor Paul's age, he will probably not be impacted by any of these changes to a great extent. If he wants to be cautious, he can reduce the COLA that he builds in to his future plans (i.e. he could use a COLA of CPI -1%)

5. Professor Paul wants advice about asset allocations. Make a recommendation about his present target asset allocation. Explain how this asset allocation should change over time.

The asset allocation that Professor Paul adopts should be a function of his risk aversion. Risk aversion is a function of an investor's <u>ability</u> and <u>willingness</u> to take on risk. Due to Professor Paul's

age and the fact that most of his working years are behind him, he can not afford to take on a great deal of risk. Professor Paul's nature will also impact to a degree that amount of risk that he can take on. Given all of these factors an asset allocation of about 50% equities and 50% bands and cash may be a reasonable place to begin his consideration of this issue. Research has shown that this asset allocation combined with a 4-5% withdrawal rate gives him a good chance of having his money last 30+ years.

Another issue that Professor Paul must consider is to what extent he wants to annuitize a portion of retirement nest egg. Annuitization is not a popular concept with many retirees because when they annuitize they give up control of the assets that were annuitized. For this reason many investors prefer to adopt a system of systematic withdrawal. Systematic withdrawal comes with its own challenges however. If too high a withdrawal rate is adopted, particularly if in the early years of retirement the financial markets experience losses, the retirement nest egg may be depleted too soon. Professor Paul has to realize that in addition to market risk, interest rate risk, inflation risk, he faces an additional type of risk longevity risk – the risk of outliving his money. One way to deal with this complex of risks is to segment his retirement portfolio into three portions. He can take enough of his nest egg (maybe 25%) and invest in a fixed annuity; this portion in combination with his Social Security retirement benefits should cover his fixed retirement expenses (housing, medical, food, insurance...). He can invest the second portion of his nest egg (perhaps another 25%) in a variable annuity. This portion can be used to cover his variable retirement expenses (clothing, eating out, travel, recreation, gifting,...). He can utilize a systematic withdrawal strategy for the remaining portion of his portfolio. While he will obviously have to customize his percentages to his individual circumstances, this strategy offers him a number of advantages. First his Social Security and fixed annuity will give a base of funds that he can use for his fixed expenses that he cannot outlive. The second portion invested in the variable annuity will allow him to invest for some growth and he can adjust his variable expenditures based on the investment performance of the variable annuity. In good years he can live it up a bit and in bad years he can tighten his belt. The third portion of his nest egg will allow him flexibility. He will have money available for large expenditures (i.e. a new car, medical expenses), he can use it to supplement the first two portions when necessary and it will provide funds in order to provide a legacy if he is interested in that.

Appendix A - The Original Retirement Plan of Professor Paul									
	Assumptions:		Inflation =	4%	Rate of return=	7%	Life expect.=	95	
			Withdrawal rate=	5%	Raises=	4%	SS Cola3	%	
	Work = Enter the phased retirement program at 55, work 50% for three years, retire fully from college Total						otal		
	403 (b) =	\$ 400,000	FV at age 55	\$ 428,000	additions of	\$15,000	FV additions	\$15,000	\$443,000
	IRA =	\$ 120,000	FV at age 55	\$ 128,400	additions of	\$2,000	FV additions	\$2,000	\$130,400
	Taxable inv.	\$ 200,000	FV at age 55	\$ 214,000	additions of	\$6,000	FV additions	\$6,000	\$220,000
	Sources:								
Age	Work	403(b)	IRA	Taxable inv.	SS	TOTAL	Live.Exp	Surp/Def	

APPENDICES
			Appendix A - T	he Original Ret	tirement Plan of P	rofessor Pa	ul		
	Assumptions:		Inflation =	4%	Rate of return=	7%	Life expect.=	95	
			Withdrawal rate=	5%	Raises=	4%	SS Cola3	%	
54	\$60,000	\$0	\$0	\$0	\$0	\$60,000	\$60,000	\$0	
55	\$31,200	\$0	\$0	\$29,274	\$0	\$60,474	\$62,400	-\$1,926	
56	\$32,448	\$0	\$0	\$29,274	\$0	\$61,722	\$64,896	-\$3,174	
57	\$33,746	\$0	\$0	\$29,274	\$0	\$63,020	\$67,492	-\$4,472	
58	\$0	\$22,150	\$6,520	\$29,274	\$0	\$57,944	\$70,192	-\$12,248	
59	\$0	\$23,036	\$6,781	\$29,274	\$0	\$59,091	\$72,999	-\$13,908	
60	\$0	\$23,957	\$7,052	\$29,274	\$0	\$60,283	\$75,919	-\$15,636	
61	\$0	\$24,916	\$7,334	\$29,274	\$0	\$61,524	\$78,956	-\$17,432	
62	\$0	\$25,912	\$7,627	\$29,274	\$17,000	\$79,814	\$82,114	-\$2,300	
63	\$0	\$26,949	\$7,933	\$29,274	\$17,510	\$81,665	\$85,399	-\$3,733	
64	\$0	\$28,027	\$8,250	\$29,274	\$18,035	\$83,586	\$88,815	-\$5,229	
65	\$0	\$29,148	\$8,580	\$0	\$18,576	\$56,304	\$92,367	-\$36,063	
66	\$0	\$30,314	\$8,923	\$0	\$19,134	\$58,371	\$96,062	-\$37,691	
67	\$0	\$31,526	\$9,280	\$0	\$19,708	\$60,514	\$99,904	-\$39,390	
68	\$0	\$32,787	\$9,651	\$0	\$20,299	\$62,737	\$103,901	-\$41,163	
69	\$0	\$34,099	\$10,037	\$0	\$20,908	\$65,044	\$108,057	-\$43,013	
70	\$0	\$35,463	\$10,439	\$0	\$21,535	\$67,437	\$112,379	-\$44,942	
71	\$0	\$36,881	\$10,856	\$0	\$22,181	\$69,919	\$116,874	-\$46,955	
72	\$0	\$38,357	\$11,291	\$0	\$22,847	\$72,494	\$121,549	-\$49,055	
73	\$0	\$39,891	\$11,742	\$0	\$23,532	\$75,165	\$126,411	-\$51,246	
74	\$0	\$41,487	\$12,212	\$0	\$24,238	\$77,936	\$131,467	-\$53,531	
75	\$0	\$43,146	\$12,700	\$0	\$24,965	\$80,811	\$136,726	-\$55,915	
76	\$0	\$44,872	\$13,208	\$0	\$25,714	\$83,794	\$142,195	-\$58,401	
77	\$0	\$46,667	\$13,737	\$0	\$26,485	\$86,889	\$147,883	-\$60,994	
78	\$0	\$48,533	\$14,286	\$0	\$27,280	\$90,100	\$153,798	-\$63,699	
79	\$0	\$50,475	\$14,858	\$0	\$28,098	\$93,431	\$159,950	-\$66,519	
80	\$0	\$52,494	\$15,452	\$0	\$28,941	\$96,887	\$166,348	-\$69,461	
81	\$0	\$54,593	\$16,070	\$0	\$29,810	\$100,473	\$173,002	-\$72,529	
82	\$0	\$56,777	\$16,713	\$0	\$30,704	\$104,194	\$179,922	-\$75,728	
83	\$0	\$59,048	\$17,381	\$0	\$31,625	\$108,055	\$187,119	-\$79,065	
84	\$0	\$61,410	\$18,077	\$0	\$32,574	\$112,060	\$194,604	-\$82,543	
85	\$0	\$63,867	\$18,800	\$0	\$33,551	\$116,217	\$202,388	-\$86,171	
86	\$0	\$66,421	\$19,552	\$0	\$34,557	\$120,530	\$210,484	-\$89,953	
87	\$0	\$69,078	\$20,334	\$0	\$35,594	\$125,006	\$218,903	-\$93,897	
88	\$0	\$71,841	\$21,147	\$0	\$36,662	\$129,650	\$227,659	-\$98,009	
89	\$0	\$74,715	\$21,993	\$0	\$37,762	\$134,470	\$236,765	-\$102,296	

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Appendix A - The Original Retirement Plan of Professor Paul									
	Assumptions:		Inflation = 4%		Rate of return=	7%	Life expect.=	95	
			Withdrawal rate=	5%	Raises=	4%	SS Cola3	%	
90	\$0	\$77,704	\$22,873	\$0	\$38,895	\$139,471	\$246,236	-\$106,765	
91	\$0	\$80,812	\$23,787	\$0	\$40,062	\$144,661	\$256,085	-\$111,425	
92	\$0	\$84,044	\$24,739	\$0	\$41,263	\$150,047	\$266,329	-\$116,282	
93	\$0	\$87,406	\$25,729	\$0	\$42,501	\$155,636	\$276,982	-\$121,346	
94	\$0	\$90,902	\$26,758	\$0	\$43,776	\$161,436	\$288,061	-\$126,625	
95	\$0	\$94,538	\$27,828	\$0	\$45,090	\$167,456	\$299,584	-\$132,128	
Concl	usion: This plan	will not wo	rk! It results in a de	eficit in every y	/ear!				

	Appendix B - Increase contributions to retirement accounts									
			Hig	ghlighted areas	s indicate chang	es from the ba	ise case			
	A	ssumptions:	Inflation =	4%	Rate of return=	= 7%	Life expect.=	95		
			Withdrawal rate	= 5%	Raises= 4%		SS Cola 3%			
			Iı	ncrease fundin	g to retirement					
			403(b)	\$ 22,000.00	plus em	ployer match				
			IRA	\$ 6,000.00						
	Work =	Enter the p	hased retirement	ed retirement program at 55, work 50% for three years, retire ful					Total	Pymt/B
	403 (b) =	\$ 400,000	FV at age 55	\$ 428,000	additions of	\$22,000	FV additions	\$22,000	\$450,000	5% withdra wal rate
	IRA=	\$ 120,000	FV at age 55	\$ 128,400	additions of	\$6,000	FV additions	\$6,000	\$134,400	5% withdra wal rate
	Taxable inv.	\$ 200,000	FV at age 55	\$ 214,000	additions of	\$6,000	FV additions	\$6,000	\$220,000	10 yr.payou t annuity
	Sources:									
Age	Work	403(b)	IRA	Taxable inv.	SS	TOTAL	Live.Exp	Surp/Def		
54	\$60,000	\$0	\$0	\$0	\$0	\$60,000	\$60,000	\$0		
55	\$31,200	\$0	\$0	\$29,274	\$0	\$60,474	\$62,400	-\$1,926		
56	\$32,448	\$0	\$0	\$29,274	\$0	\$61,722	\$64,896	-\$3,174		
57	\$33,746	\$0	\$0	\$29,274	\$0	\$63,020	\$67,492	-\$4,472		
58	\$0	\$22,500	\$6,720	\$29,274	\$0	\$58,494	\$70,192	-\$11,698		
59	\$0	\$23,400	\$6,989	\$29,274	\$0	\$59,663	\$72,999	-\$13,336		
60	\$0	\$24,336	\$7,268	\$29,274	\$0	\$60,878	\$75,919	-\$15,041		
61	\$0	\$25,309	\$7,559	\$29,274	\$0	\$62,143	\$78,956	-\$16,813		
62	\$0	\$26,322	\$7,861	\$29,274	\$17,000	\$80,457	\$82,114	-\$1,657		

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Appendix B - Increase contributions to retirement accounts									
			Hig	hlighted areas	indicate chang	es from the ba	ise case		
63	\$0	\$27,375	\$8,176	\$29,274	\$17,510	\$82,335	\$85,399	-\$3,064	
64	\$0	\$28,470	\$8,503	\$29,274	\$18,035	\$84,282	\$88,815	-\$4,533	
65	\$0	\$29,608	\$8,843	\$0	\$18,576	\$57,028	\$92,367	-\$35,339	
66	\$0	\$30,793	\$9,197	\$0	\$19,134	\$59,123	\$96,062	-\$36,939	
67	\$0	\$32,025	\$9,565	\$0	\$19,708	\$61,297	\$99,904	-\$38,608	
68	\$0	\$33,305	\$9,947	\$0	\$20,299	\$63,552	\$103,901	-\$40,349	
69	\$0	\$34,638	\$10,345	\$0	\$20,908	\$65,891	\$108,057	-\$42,166	
70	\$0	\$36,023	\$10,759	\$0	\$21,535	\$68,317	\$112,379	-\$44,062	
71	\$0	\$37,464	\$11,189	\$0	\$22,181	\$70,835	\$116,874	-\$46,039	
72	\$0	\$38,963	\$11,637	\$0	\$22,847	\$73,446	\$121,549	-\$48,103	
73	\$0	\$40,521	\$12,102	\$0	\$23,532	\$76,156	\$126,411	-\$50,255	
74	\$0	\$42,142	\$12,586	\$0	\$24,238	\$78,966	\$131,467	-\$52,501	
75	\$0	\$43,828	\$13,090	\$0	\$24,965	\$81,883	\$136,726	-\$54,843	
76	\$0	\$45,581	\$13,613	\$0	\$25,714	\$84,908	\$142,195	-\$57,287	
77	\$0	\$47,404	\$14,158	\$0	\$26,485	\$88,048	\$147,883	-\$59,835	
78	\$0	\$49,300	\$14,724	\$0	\$27,280	\$91,305	\$153,798	-\$62,494	
79	\$0	\$51,272	\$15,313	\$0	\$28,098	\$94,684	\$159,950	-\$65,266	
80	\$0	\$53,323	\$15,926	\$0	\$28,941	\$98,190	\$166,348	-\$68,158	
81	\$0	\$55,456	\$16,563	\$0	\$29,810	\$101,829	\$173,002	-\$71,174	
82	\$0	\$57,674	\$17,225	\$0	\$30,704	\$105,604	\$179,922	-\$74,319	
83	\$0	\$59,981	\$17,914	\$0	\$31,625	\$109,521	\$187,119	-\$77,598	
84	\$0	\$62,381	\$18,631	\$0	\$32,574	\$113,585	\$194,604	-\$81,019	
85	\$0	\$64,876	\$19,376	\$0	\$33,551	\$117,803	\$202,388	-\$84,585	
86	\$0	\$67,471	\$20,151	\$0	\$34,557	\$122,180	\$210,484	-\$88,304	
87	\$0	\$70,170	\$20,957	\$0	\$35,594	\$126,721	\$218,903	-\$92,182	
88	\$0	\$72,976	\$21,796	\$0	\$36,662	\$131,434	\$227,659	-\$96,225	
89	\$0	\$75,896	\$22,667	\$0	\$37,762	\$136,325	\$236,765	-\$100,440	
90	\$0	\$78,931	\$23,574	\$0	\$38,895	\$141,400	\$246,236	-\$104,836	
91	\$0	\$82,089	\$24,517	\$0	\$40,062	\$146,667	\$256,085	-\$109,418	
92	\$0	\$85,372	\$25,498	\$0	\$41,263	\$152,133	\$266,329	-\$114,195	
93	\$0	\$88,787	\$26,518	\$0	\$42,501	\$157,806	\$276,982	-\$119,176	
94	\$0	\$92,338	\$27,578	\$0	\$43,776	\$163,693	\$288,061	-\$124,368	
95	\$0	\$96,032	\$28,682	\$0	\$45,090	\$169,803	\$299,584	-\$129,780	
Conclu	ısion:	This option There is s	on results in a v still a deficit in e	ery small imp ach year.	rovement beca	use the incre	ased contributio	ns last for on	ly 1 year.

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		A	pp	endix C - assume	al	higher rate	e of return on l	his pre-retir	ement investm	ents		
	Assumptions:			Inflation =		4%	Rate of return=	= 8%	Life expect.=	95		
				Withdrawal rate	=	5%	Raises=	4%	SS Cola	3 %		
	Work =	Enter the	pha	sed retirement pro	ogr	ram at 55, v	vork 50% for th	iree years, ret	tire fully from c	ollege	Total	Pymt/B
	403 (b) =	\$ 400,0	00	FV at age 55	\$	432,000	additions of	\$15,000	FV additions	\$15,000	\$447,000	5% withdrawa l rate
	IRA =	\$ 120,0	00	FV at age 55	\$	129,600	additions of	\$2,000	FV additions	\$2,000	\$131,600	5% withdrawa l rate
	Taxable inv.	\$ 200,0	00	FV at age 55	\$	216,000	additions of	\$6,000	FV additions	\$6,000	\$222,000	10 yr.payout
	Sources:											
Age	Work	40.	<mark>8(b</mark>)	IRA		Taxable inv.	SS	TOTAL	Live.Exp	Surp/Def		
54	\$60,000		\$0	\$0		\$0	\$0	\$60,000	\$60,000	\$0		
55	\$31,200		\$0	\$0		\$30,358	\$0	\$61,558	\$62,400	-\$842		
56	\$32,448		\$0	\$0		\$30,358	\$0	\$62,806	\$64,896	-\$2,090		
57	\$33,746		\$0	\$0		\$30,358	\$0	\$64,104	\$67,492	-\$3,388		
58	\$0	\$22 ,	350	\$6,580		\$30,358	\$0	\$59,288	\$70,192	-\$10,904		
59	\$0	\$23 ,	244	\$6,843		\$30,358	\$0	\$60,445	\$72,999	-\$12,554		
60	\$0	\$24,	174	\$7,117		\$30,358	\$0	\$61,649	\$75,919	-\$14,270		
61	\$0	\$25,	141	\$7,402		\$30,358	\$0	\$62,900	\$78,956	-\$16,056		
62	\$0	\$26,	146	\$7,698		\$30,358	\$17,000	\$81,202	\$82,114	-\$912		
63	\$0	\$27,	192	\$8,006		\$30,358	\$17,510	\$83,066	\$85,399	-\$2,333		
64	\$0	\$28 ,	280	\$8,326		\$30,358	\$18,035	\$84,999	\$88,815	-\$3,816		
65	\$0	\$29 ,	411	\$8,659		\$0	\$18,576	\$56,646	\$92,367	-\$35,721		
66	\$0	\$30,	588	\$9,005		\$0	\$19,134	\$58,726	\$96,062	-\$37,336		
67	\$0	\$31,	811	\$9,365		\$0	\$19,708	\$60,884	\$99,904	-\$39,020		
68	\$0	\$33,	083	\$9,740		\$0	\$20,299	\$63,122	\$103,901	-\$40,778		
69	\$0	\$34,	407	\$10,130		\$0	\$20,908	\$65,444	\$108,057	-\$42,612		
70	\$0	\$35,	783	\$10,535		\$0	\$21,535	\$67,853	\$112,379	-\$44,526		
71	\$0	\$37,	214	\$10,956		\$0	\$22,181	\$70,352	\$116,874	-\$46,522		
72	\$0	\$38,	703	\$11,394		\$0	\$22,847	\$72,944	\$121,549	-\$48,605		
73	\$0	\$40,	251	\$11,850		\$0	\$23,532	\$75,633	\$126,411	-\$50,778		
74	\$0	\$41,	861	\$12,324		\$0	\$24,238	\$78,423	\$131,467	-\$53,044		
75	\$0	\$43,	536	\$12,817		\$0	\$24,965	\$81,318	\$136,726	-\$55,408		
76	\$0	\$45,	277	\$13,330		\$0	\$25,714	\$84,321	\$142,195	-\$57,874		
77	\$0	\$47,	088	\$13,863		\$0	\$26,485	\$87,437	\$147,883	-\$60,446		

		Аррег	ndix C - assume	a higher rate	e of return on h	is pre-retire	ement investme	ents		
78	\$0	\$48,972	\$14,418	\$0	\$27,280	\$90,669	\$153,798	-\$63,129		
79	\$0	\$50,930	\$14,994	\$0	\$28,098	\$94,023	\$159,950	-\$65,927		
80	\$0	\$52,968	\$15,594	\$0	\$28,941	\$97,503	\$166,348	-\$68,845		
81	\$0	\$55,086	\$16,218	\$0	\$29,810	\$101,114	\$173,002	-\$71,888		
82	\$0	\$57,290	\$16,867	\$0	\$30,704	\$104,860	\$179,922	-\$75,062		
83	\$0	\$59,581	\$17,541	\$0	\$31,625	\$108,748	\$187,119	-\$78,371		
84	\$0	\$61,965	\$18,243	\$0	\$32,574	\$112,781	\$194,604	-\$81,823		
85	\$0	\$64,443	\$18,973	\$0	\$33,551	\$116,967	\$202,388	-\$85,421		
86	\$0	\$67,021	\$19,731	\$0	\$34,557	\$121,310	\$210,484	-\$89,174		
87	\$0	\$69,702	\$20,521	\$0	\$35,594	\$125,817	\$218,903	-\$93,086		
88	\$0	\$72,490	\$21,342	\$0	\$36,662	\$130,494	\$227,659	-\$97,165		
89	\$0	\$75,390	\$22,195	\$0	\$37,762	\$135,347	\$236,765	-\$101,419		
90	\$0	\$78,405	\$23,083	\$0	\$38,895	\$140,383	\$246,236	-\$105,853		
91	\$0	\$81,541	\$24,006	\$0	\$40,062	\$145,609	\$256,085	-\$110,476		
92	\$0	\$84,803	\$24,967	\$0	\$41,263	\$151,033	\$266,329	-\$115,296		
93	\$0	\$88,195	\$25,965	\$0	\$42,501	\$156,662	\$276,982	-\$120,320		
94	\$0	\$91,723	\$27,004	\$0	\$43,776	\$162,503	\$288,061	-\$125,558		
95	\$0	\$95,392	\$28,084	\$0	\$45,090	\$168,566	\$299,584	-\$131,018		
Conclu	usion:	This option re There is still a	esults in a very s a deficit in each	mall improve year .	ement because	the increase	d rate of retur	n last for o	nly 1 year.	

	Appendix D - assume a lower rate of inflation											
	Assumptions	:	Inflation =	3	%	Rate of return=	- 7%	Life expect.=	95			
			Withdrawal rate=	: 5	5%	Raises=	4%	SS Cola	3%			
	Work =	Enter the pl	hased retirement p	rograr	n at 55, v	vork 50% for th	ree years, ret	ire fully from c	ollege	Total	Pymt/B	
	403 (b) =	\$ 400,000	FV at age 55	\$ 4	428,000	additions of	\$15,000	FV additions	\$15,000	\$443,000	5% withdrawa l rate	
	IRA =	\$ 120,000	FV at age 55	\$ 1	28,400	additions of	\$2,000	FV additions	\$2,000	\$130,400	5% withdrawa l rate	
	Taxable inv.	\$ 200,000	FV at age 55	\$ 2	214,000	additions of	\$6,000	FV additions	\$6,000	\$220,000	10 yr.payout	
	Sources:											
Age	Work	403(b)	IRA	Taxa	able inv.	SS	TOTAL	Live.Exp	Surp/Def			
54	\$60,000	\$0	\$0		\$0	\$0	\$60,000	\$60,000	\$0			
55	\$31,200	\$0	\$0		\$29,274	\$0	\$60,474	\$61,800	-\$1,326			
56	\$32,448	\$0	\$0		\$29,274	\$0	\$61,722	\$63,654	-\$1,932			
57	\$33,746	\$0	\$0		\$29,274	\$0	\$63,020	\$65,564	-\$2,544			

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	Appendix D - assume a lower rate of inflation									
58	\$0	\$22,150	\$6,520	\$29,274	\$0	\$57,944	\$67,531	-\$9,587		
59	\$0	\$23,036	\$6,781	\$29,274	\$0	\$59,091	\$69,556	-\$10,466		
60	\$0	\$23,957	\$7,052	\$29,274	\$0	\$60,283	\$71,643	-\$11,360		
61	\$0	\$24,916	\$7,334	\$29,274	\$0	\$61,524	\$73,792	-\$12,269		
62	\$0	\$25,912	\$7,627	\$29,274	\$17,000	\$79,814	\$76,006	\$3,808		
63	\$0	\$26,949	\$7,933	\$29,274	\$17,510	\$81,665	\$78,286	\$3,379		
64	\$0	\$28,027	\$8,250	\$29,274	\$18,035	\$83,586	\$80,635	\$2,951		
65	\$0	\$29,148	\$8,580	\$0	\$18,576	\$56,304	\$83,054	-\$26,750		
66	\$0	\$30,314	\$8,923	\$0	\$19,134	\$58,371	\$85,546	-\$27,175		
67	\$0	\$31,526	\$9,280	\$0	\$19,708	\$60,514	\$88,112	-\$27,598		
68	\$0	\$32,787	\$9,651	\$0	\$20,299	\$62,737	\$90,755	-\$28,018		
69	\$0	\$34,099	\$10,037	\$0	\$20,908	\$65,044	\$93,478	-\$28,434		
70	\$0	\$35,463	\$10,439	\$0	\$21,535	\$67,437	\$96,282	-\$28,846		
71	\$0	\$36,881	\$10,856	\$0	\$22,181	\$69,919	\$99,171	-\$29,252		
72	\$0	\$38,357	\$11,291	\$0	\$22,847	\$72,494	\$102,146	-\$29,652		
73	\$0	\$39,891	\$11,742	\$0	\$23,532	\$75,165	\$105,210	-\$30,045		
74	\$0	\$41,487	\$12,212	\$0	\$24,238	\$77,936	\$108,367	-\$30,430		
75	\$0	\$43,146	\$12,700	\$0	\$24,965	\$80,811	\$111,618	-\$30,806		
76	\$0	\$44,872	\$13,208	\$0	\$25,714	\$83,794	\$114,966	-\$31,172		
77	\$0	\$46,667	\$13,737	\$0	\$26,485	\$86,889	\$118,415	-\$31,526		
78	\$0	\$48,533	\$14,286	\$0	\$27,280	\$90,100	\$121,968	-\$31,868		
79	\$0	\$50,475	\$14,858	\$0	\$28,098	\$93,431	\$125,627	-\$32,196		
80	\$0	\$52,494	\$15,452	\$0	\$28,941	\$96,887	\$129,395	-\$32,509		
81	\$0	\$54,593	\$16,070	\$0	\$29,810	\$100,473	\$133,277	-\$32,804		
82	\$0	\$56,777	\$16,713	\$0	\$30,704	\$104,194	\$137,276	-\$33,082		
83	\$0	\$59,048	\$17,381	\$0	\$31,625	\$108,055	\$141,394	-\$33,339		
84	\$0	\$61,410	\$18,077	\$0	\$32,574	\$112,060	\$145,636	-\$33,575		
85	\$0	\$63,867	\$18,800	\$0	\$33,551	\$116,217	\$150,005	-\$33,788		
86	\$0	\$66,421	\$19,552	\$0	\$34,557	\$120,530	\$154,505	-\$33,975		
87	\$0	\$69,078	\$20,334	\$0	\$35,594	\$125,006	\$159,140	-\$34,134		
88	\$0	\$71,841	\$21,147	\$0	\$36,662	\$129,650	\$163,914	-\$34,264		
89	\$0	\$74,715	\$21,993	\$0	\$37,762	\$134,470	\$168,832	-\$34,362		
90	\$0	\$77,704	\$22,873	\$0	\$38,895	\$139,471	\$173,897	-\$34,426		
91	\$0	\$80,812	\$23,787	\$0	\$40,062	\$144,661	\$179,114	-\$34,453		
92	\$0	\$84,044	\$24,739	\$0	\$41,263	\$150,047	\$184,487	-\$34,440		
93	\$0	\$87,406	\$25,729	\$0	\$42,501	\$155,636	\$190,022	-\$34,386		
94	\$0	\$90,902	\$26,758	\$0	\$43,776	\$161,436	\$195,722	-\$34,286		
95	\$0	\$94,538	\$27,828	\$0	\$45,090	\$167,456	\$201,594	-\$34,138		

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 Appendix D - assume a lower rate of inflation

 Conclusion:
 This option results in a significant improvement because the lower inflation rate impacts the rest of his life. There is no longer a deficit in each year. However this is a more dangerous option because Professor Paul can not control the CPI. It should be pointed out however that he can control his own personal expenses to a degree by adjusting his discretionary expenses.

			Арр	endix E -	assume a higher v	vithdrawal r	ate			
	Assumptions	:	Inflation =	4%	Rate of return=	7%	Life expect.=	95		
		_	Withdrawal rate=	= 6.2%	Raises=	4%	SS Cola	3%		
	Work =	Enter the phase	sed retirement pro	ogram at 55	, work 50% for th	ree years, reti	re fully from c	ollege	Total	Pymt/B
	403 (b) =	\$ 400,000	FV at age 55	\$ 428,00	00 additions of	\$15,000	FV additions	\$15,000	\$443,000	6.2% withdrawa l rate
	IRA =	\$ 120,000	FV at age 55	\$ 128,40	00 additions of	\$2,000	FV additions	\$2,000	\$130,400	6.2% withdrawa l rate
	Taxable inv.	\$ 200,000	FV at age 55	\$ 214,0	00 additions of	\$6,000	FV additions	\$6,000	\$220,000	10 yr.payout
	Sources:									
Age	Work	403(b)	IRA	Taxal ii	ole SS IV.	TOTAL	Live.Exp	Surp/Def		
54	\$60,000	\$0	\$0		\$0 \$0	\$60,000	\$60,000	\$0		
55	\$31,200	\$0	\$0	\$29,2	74 \$0	\$60,474	\$62,400	-\$1,926		
56	\$32,448	\$0	\$0	\$29,2	74 \$0	\$61,722	\$64,896	-\$3,174		
57	\$33,746	\$0	\$0	\$29,2	74 \$0	\$63,020	\$67,492	-\$4,472		
58	\$0	\$27,466	\$8,085	\$29,2	74 \$0	\$64,825	\$70,192	-\$5,367		
59	\$0	\$28,565	\$8,408	\$29,2	74 \$0	\$66,247	\$72,999	-\$6,752		
60	\$0	\$29,707	\$8,745	\$29,2	74 \$0	\$67,726	\$75,919	-\$8,193		
61	\$0	\$30,896	\$9,094	\$29,2	74 \$0	\$69,264	\$78,956	-\$9,692		
62	\$0	\$32,131	\$9,458	\$29,2	74 \$17,000	\$87,863	\$82,114	\$5,749		
63	\$0	\$33,417	\$9,836	\$29,2	74 \$17,510	\$90,037	\$85,399	\$4,638		
64	\$0	\$34,753	\$10,230	\$29,2	74 \$18,035	\$92,292	\$88,815	\$3,478		
65	\$0	\$36,143	\$10,639		\$0 \$18,576	\$65,359	\$92,367	-\$27,008		
66	\$0	\$37,589	\$11,065		\$0 \$19,134	\$67,787	\$96,062	-\$28,275		
67	\$0	\$39,093	\$11,507		\$0 \$19,708	\$70,308	\$99,904	-\$29,597		
68	\$0	\$40,656	\$11,967		\$0 \$20,299	\$72,923	\$103,901	-\$30,978		
69	\$0	\$42,283	\$12,446		\$0 \$20,908	\$75,637	\$108,057	-\$32,420		
70	\$0	\$43,974	\$12,944		\$0 \$21,535	\$78,453	\$112,379	-\$33,926		
71	\$0	\$45,733	\$13,462		\$0 \$22,181	\$81,376	\$116,874	-\$35,498		
72	\$0	\$47,562	\$14,000		\$0 \$22,847	\$84,409	\$121,549	-\$37,140		
73	\$0	\$49,465	\$14,560		\$0 \$23,532	\$87,557	\$126,411	-\$38,854		

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	Appendix E - assume a higher withdrawal rate													
74	\$0	\$51,443	\$15,143	\$0	\$24,238	\$90,824	\$131,467	-\$40,643						
75	\$0	\$53,501	\$15,748	\$0	\$24,965	\$94,214	\$136,726	-\$42,512						
76	\$0	\$55,641	\$16,378	\$0	\$25,714	\$97,733	\$142,195	-\$44,462						
77	\$0	\$57,867	\$17,033	\$0	\$26,485	\$101,386	\$147,883	-\$46,497						
78	\$0	\$60,181	\$17,715	\$0	\$27,280	\$105,176	\$153,798	-\$48,622						
79	\$0	\$62,589	\$18,423	\$0	\$28,098	\$109,110	\$159,950	-\$50,840						
80	\$0	\$65,092	\$19,160	\$0	\$28,941	\$113,194	\$166,348	-\$53,154						
81	\$0	\$67,696	\$19,927	\$0	\$29,810	\$117,432	\$173,002	-\$55,570						
82	\$0	\$70,404	\$20,724	\$0	\$30,704	\$121,831	\$179,922	-\$58,091						
83	\$0	\$73,220	\$21,553	\$0	\$31,625	\$126,398	\$187,119	-\$60,721						
84	\$0	\$76,149	\$22,415	\$0	\$32,574	\$131,137	\$194,604	-\$63,467						
85	\$0	\$79,195	\$23,311	\$0	\$33,551	\$136,057	\$202,388	-\$66,331						
86	\$0	\$82,362	\$24,244	\$0	\$34,557	\$141,164	\$210,484	-\$69,320						
87	\$0	\$85,657	\$25,214	\$0	\$35,594	\$146,465	\$218,903	-\$72,438						
88	\$0	\$89,083	\$26,222	\$0	\$36,662	\$151,967	\$227,659	-\$75,692						
89	\$0	\$92,646	\$27,271	\$0	\$37,762	\$157,680	\$236,765	-\$79,086						
90	\$0	\$96,352	\$28,362	\$0	\$38,895	\$163,609	\$246,236	-\$82,627						
91	\$0	\$100,206	\$29,496	\$0	\$40,062	\$169,764	\$256,085	-\$86,321						
92	\$0	\$104,215	\$30,676	\$0	\$41,263	\$176,154	\$266,329	-\$90,174						
93	\$0	\$108,383	\$31,903	\$0	\$42,501	\$182,788	\$276,982	-\$94,194						
94	\$0	\$112,719	\$33,179	\$0	\$43,776	\$189,674	\$288,061	-\$98,387						
95	\$0	\$117,227	\$34,507	\$0	\$45,090	\$196,824	\$299,584	-\$102,760						
Concl	usion:	This option There is no l It is based of increase the increases aft from their i	results in a signi longer a deficit i n a 2003 article i ir initial withdra ter years of bad nyestments: it do	ficant impro n each year a in the Journa awal rate if tl market perfo pes increase t	vement because and the deficits and the deficits of <i>Financial F</i> hey are willing to prmance. While the risk of runn	ti impacts t are reduced <i>lanning</i> by (to limit their this approa- ing out of mo	he rest of his l l. Goyette; he m '''inflation rai ch will increas oney.	ife. aintains tha ise" each ye: se the retire:	t retirees ca ar and defe es annual c	an r these ash flow				

Appendix F - stay in the phased retirement program for five years instead of three years													
Assumptions	s:	Inflation =	4%	Rate of return=	7%	Life expect.=	95						
	Withdrawal rate= 5% Raises= 4% SS Cola 3%												
This option will allow Professor Paul to contribut to his retirement accounts for 2 more years.													
	This will also allow him to tap into his retirement accounts two years later												
Work =	Enter the pha	ised retirement r	program at 57, w	<mark>ork 50% for thr</mark>	ee years, reti	re fully from co	llege	Total	Pymt/B				
$403 \text{ (b)} = \begin{cases} 400,000 & \text{FV at age 58} \\ \$ & 490,017 \\ \$ & 490,017 \end{cases} additions of \begin{cases} \$15,000 & \text{FV additions} \\ \$48,224 \\ \$538,241 \\ \texttt{with} \end{cases}$													
IRA =	\$ 120,000	FV at age 58	\$ 147,005	additions of	\$2,000	FV additions	<mark>\$6,430</mark>	\$153,435	5%				

		Append	dix F - stay in t	he phased retir	ement program	ı for five yea	rs instead of th	ree years		
										withdrawal
										rate
	Taxable inv.	\$ 200,000	FV at age 55	\$ 214,000	additions of	\$6,000	FV additions	\$6,000	\$220,000	10 yr.payout
	Sources:									
Age	Work	403(b)	IRA	Taxable inv.	SS	TOTAL	Live.Exp	Surp/Def		
54	\$60,000			\$0	\$0	\$60,000	\$60,000	\$0		
55	\$31,200			\$29,274	\$0	\$60,474	\$62,400	-\$1,926		
56	\$32,448			\$29,274	\$0	\$61,722	\$64,896	-\$3,174		
57	\$33,746			\$29,274	\$0	\$63,020	\$67,492	-\$4,472		
58	\$34,758			\$29,274	\$0	\$64,032	\$70,192	-\$6,159		
59	\$35,801			\$29,274	\$0	\$65,075	\$72,999	-\$7,924		
60	\$0	\$26,912	\$7,672	\$29,274	\$0	\$63,858	\$75,919	-\$12,061		
61	\$0	\$27,989	\$7,979	\$29,274	\$0	\$65,241	\$78,956	-\$13,715		
62	\$0	\$29,108	\$8,298	\$29,274	\$17,000	\$83,680	\$82,114	\$1,566		
63	\$0	\$30,272	\$8,630	\$29,274	\$17,510	\$85,686	\$85,399	\$287		
64	\$0	\$31,483	\$8,975	\$29,274	\$18,035	\$87,767	\$88,815	-\$1,047		
65	\$0	\$32,743	\$9,334	\$0	\$18,576	\$60,653	\$92,367	-\$31,714		
66	\$0	\$34,052	\$9,707	\$0	\$19,134	\$62,893	\$96,062	-\$33,169		
67	\$0	\$35,414	\$10,095	\$0	\$19,708	\$65,218	\$99,904	-\$34,687		
68	\$0	\$36,831	\$10,499	\$0	\$20,299	\$67,629	\$103,901	-\$36,271		
69	\$0	\$38,304	\$10,919	\$0	\$20,908	\$70,131	\$108,057	-\$37,925		
70	\$0	\$39,836	\$11,356	\$0	\$21,535	\$72,728	\$112,379	-\$39,651		
71	\$0	\$41,430	\$11,810	\$0	\$22,181	\$75,421	\$116,874	-\$41,453		
72	\$0	\$43,087	\$12,283	\$0	\$22,847	\$78,216	\$121,549	-\$43,333		
73	\$0	\$44,811	\$12,774	\$0	\$23,532	\$81,117	\$126,411	-\$45,294		
74	\$0	\$46,603	\$13,285	\$0	\$24,238	\$84,126	\$131,467	-\$47,342		
75	\$0	\$48,467	\$13,816	\$0	\$24,965	\$87,249	\$136,726	-\$49,478		
76	\$0	\$50,406	\$14,369	\$0	\$25,714	\$90,489	\$142,195	-\$51,706		
77	\$0	\$52,422	\$14,944	\$0	\$26,485	\$93,851	\$147,883	-\$54,032		
78	\$0	\$54,519	\$15,542	\$0	\$27,280	\$97,340	\$153,798	-\$56,458		
79	\$0	\$56,700	\$16,163	\$0	\$28,098	\$100,961	\$159,950	-\$58,989		
80	\$0	\$58,968	\$16,810	\$0	\$28,941	\$104,719	\$166,348	-\$61,629		
81	\$0	\$61,326	\$17,482	\$0	\$29,810	\$108,618	\$173,002	-\$64,384		
82	\$0	\$63,779	\$18,181	\$0	\$30,704	\$112,665	\$179,922	-\$67,258		
83	\$0	\$66,331	\$18,909	\$0	\$31,625	\$116,864	\$187,119	-\$70,255		
84	\$0	\$68,984	\$19,665	\$0	\$32,574	\$121,223	\$194,604	-\$73,381		
85	\$0	\$71,743	\$20,452	\$0	\$33,551	\$125,746	\$202,388	-\$76,642		

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		Append	lix F - stay in t	he phased retire	ement program	for five year	rs instead of th	ree years					
86	\$0	\$74,613	\$21,270	\$0	\$34,557	\$130,440	\$210,484	-\$80,043					
87	\$0	\$77,597	\$22,120	\$0	\$35,594	\$135,312	\$218,903	-\$83,591					
88	\$0	\$80,701	\$23,005	\$0	\$36,662	\$140,369	\$227,659	-\$87,290					
89	\$0	\$83,929	\$23,926	\$0	\$37,762	\$145,617	\$236,765	-\$91,149					
90	\$0	\$87,286	\$24,883	\$0	\$38,895	\$151,064	\$246,236	-\$95,172					
91	\$0	\$90,778	\$25,878	\$0	\$40,062	\$156,717	\$256,085	-\$99,368					
92	\$0	\$94,409	\$26,913	\$0	\$41,263	\$162,585	\$266,329	-\$103,743					
93	\$0	\$98,185	\$27,989	\$0	\$42,501	\$168,676	\$276,982	-\$108,306					
94	\$0	\$102,113	\$29,109	\$0	\$43,776	\$174,998	\$288,061	-\$113,063					
95	\$0	\$106,197	\$30,273	\$0	\$45,090	\$181,560	\$299,584	-\$118,023					
Concl	onclusion: This option results in a modest improvement because he is able to invest for two more years and his 403(b) and IRA are able to grow for two more years. However he still has a deficit in most years.												

	Appendix G - enter phased retirement program at age 58 (not 55)													
	Assumptions	:	Inflation =		4%	Rate of return=	7%	Life expect.=	95					
			Withdrawal rate=	=	5%	Raises=	4%	SS Cola	3%					
		This option w	will allow Profess	or l	Paul to con	tribut to his ret	irement acco	unts for 3 more	years.					
		This will also	o allow him to tap	int	to his retire	ement accounts	three years la	uter						
	Work =	Enter the ph	ased retirement p	rog	ram at 58,	work 50% for th	nree years, re	tire fully from c	ollege	Total	Pymt/B			
	403 (b) =	\$ 400,000	FV at age 58	\$	524,318	additions of	\$15,000	FV additions	\$66,599	\$590,917	5% withdrawal rate			
	IRA =	\$ 120,000	FV at age 58	\$	157,296	additions of	\$2,000	FV additions	\$8,880	\$166,176	5% withdrawal rate			
	Taxable inv.	\$ 200,000	FV at age 58	\$	262,159	additions of	\$6,000	FV additions	\$26,640	\$288,799	10 yr.payout			
	Sources:													
Age	Work	403(b)	IRA		Taxable inv.	SS	TOTAL	Live.Exp	Surp/Def					
54	\$60,000					\$0	\$60,000	\$60,000	\$0					
55	\$62,400					\$0	\$62,400	\$62,400	\$0					
56	\$64,896					\$0	\$64,896	\$64,896	\$0					
57	\$67,492					\$0	\$67,492	\$67,492	\$0					
58	\$35,096				\$38,429	\$0	\$73,525	\$70,192	\$3,333					
59	\$36,500				\$38,429	\$0	\$74,929	\$72,999	\$1,929					
60	\$37,960				\$38,429	\$0	\$76,389	\$75,919	\$469					
61	\$0	\$29,546	\$8,309		\$38,429	\$0	\$76,284	\$78,956	-\$2,672					

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	Appendix G - enter phased retirement program at age 58 (not 55)												
62	\$0	\$30,728	\$8,641	\$38,429	\$17,000	\$94,798	\$82,114	\$12,684					
63	\$0	\$31,957	\$8,987	\$38,429	\$17,510	\$96,883	\$85,399	\$11,484					
64	\$0	\$33,235	\$9,346	\$38,429	\$18,035	\$99,046	\$88,815	\$10,231					
65	\$0	\$34,564	\$9,720	\$38,429	\$18,576	\$101,290	\$92,367	\$8,923					
66	\$0	\$35,947	\$10,109	\$38,429	\$19,134	\$103,619	\$96,062	\$7,557					
67	\$0	\$37,385	\$10,513	\$38,429	\$19,708	\$106,035	\$99,904	\$6,130					
68	\$0	\$38,880	\$10,934	\$0	\$20,299	\$70,113	\$103,901	-\$33,788					
69	\$0	\$40,436	\$11,371	\$0	\$20,908	\$72,715	\$108,057	-\$35,342					
70	\$0	\$42,053	\$11,826	\$0	\$21,535	\$75,414	\$112,379	-\$36,965					
71	\$0	\$43,735	\$12,299	\$0	\$22,181	\$78,215	\$116,874	-\$38,659					
72	\$0	\$45,484	\$12,791	\$0	\$22,847	\$81,122	\$121,549	-\$40,427					
73	\$0	\$47,304	\$13,303	\$0	\$23,532	\$84,138	\$126,411	-\$42,272					
74	\$0	\$49,196	\$13,835	\$0	\$24,238	\$87,269	\$131,467	-\$44,199					
75	\$0	\$51,164	\$14,388	\$0	\$24,965	\$90,517	\$136,726	-\$46,209					
76	\$0	\$53,210	\$14,964	\$0	\$25,714	\$93,888	\$142,195	-\$48,307					
77	\$0	\$55,339	\$15,562	\$0	\$26,485	\$97,386	\$147,883	-\$50,496					
78	\$0	\$57,552	\$16,185	\$0	\$27,280	\$101,017	\$153,798	-\$52,781					
79	\$0	\$59,854	\$16,832	\$0	\$28,098	\$104,785	\$159,950	-\$55,165					
80	\$0	\$62,249	\$17,505	\$0	\$28,941	\$108,695	\$166,348	-\$57,653					
81	\$0	\$64,739	\$18,206	\$0	\$29,810	\$112,754	\$173,002	-\$60,248					
82	\$0	\$67,328	\$18,934	\$0	\$30,704	\$116,966	\$179,922	-\$62,956					
83	\$0	\$70,021	\$19,691	\$0	\$31,625	\$121,337	\$187,119	-\$65,782					
84	\$0	\$72,822	\$20,479	\$0	\$32,574	\$125,875	\$194,604	-\$68,729					
85	\$0	\$75,735	\$21,298	\$0	\$33,551	\$130,584	\$202,388	-\$71,804					
86	\$0	\$78,764	\$22,150	\$0	\$34,557	\$135,472	\$210,484	-\$75,012					
87	\$0	\$81,915	\$23,036	\$0	\$35,594	\$140,545	\$218,903	-\$78,358					
88	\$0	\$85,192	\$23,957	\$0	\$36,662	\$145,811	\$227,659	-\$81,848					
89	\$0	\$88,599	\$24,916	\$0	\$37,762	\$151,277	\$236,765	-\$85,489					
90	\$0	\$92,143	\$25,912	\$0	\$38,895	\$156,950	\$246,236	-\$89,286					
91	\$0	\$95,829	\$26,949	\$0	\$40,062	\$162,839	\$256,085	-\$93,246					
92	\$0	\$99,662	\$28,027	\$0	\$41,263	\$168,952	\$266,329	-\$97,377					
93	\$0	\$103,649	\$29,148	\$0	\$42,501	\$175,298	\$276,982	-\$101,684					
94	\$0	\$107,795	\$30,314	\$0	\$43,776	\$181,885	\$288,061	-\$106,177					
95	\$0	\$112,106	\$31,526	\$0	\$45,090	\$188,722	\$299,584	-\$110,861					
Concl	usion:	This option	results in more	improvemen	t because he is	able to work	and invest lon	iger					
		As a result However h	his 403(b) and I e still has a defic	RA are able t it in most vea	o grow signific rs.	antly larger							
		110.00001	e som nus a uelle										

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		Appendix HI - work part time during retirement												
	Assumptions	:	Inflation =	4%	Rate of return=	7%	Life expect.=	95						
			Withdrawal rate=	= 5%	Raises=	4%	SS Cola	3%						
		Professor Pa	ul will work part	time and earn	\$10,000. per ye	ar for 10 year	rs							
		after he exit.	s the phased retire	ement program	n at his school									
	Work =	Enter the p	hased retirement _l	program at 55	, work 50% for	three years, r	etire fully from	college	Total	Pymt/B				
	403 (b) =	\$ 400,000	FV at age 55	\$ 428,000	additions of	\$15,000	FV additions	\$15,000	\$443,000	5% withdrawal rate				
	IRA =	\$ 120,000	FV at age 55	\$ 128,400	additions of	\$2,000	FV additions	\$2,000	\$130,400	5% withdrawal rate				
	Taxable inv.	\$ 200,000	FV at age 55	\$ 214,000	additions of	\$6,000	FV additions	\$6,000	\$220,000	10 yr.payout				
	Sources:													
Age	Work	403(b)	IRA	Taxable inv.	SS	TOTAL	Live.Exp	Surp/Def						
54	\$60,000	\$0	\$0	\$0	\$0	\$60,000	\$60,000	\$0						
55	\$31,200	\$0	\$0	\$29,274	\$0	\$60,474	\$62,400	-\$1,926						
56	\$32,448	\$0	\$0	\$29,274	\$0	\$61,722	\$64,896	-\$3,174						
57	\$33,746	\$0	\$0	\$29,274	\$0	\$63,020	\$67,492	-\$4,472						
58	\$10,000	\$22,150	\$6,520	\$29,274	\$0	\$67,944	\$70,192	-\$2,248						
59	\$10,000	\$23,036	\$6,781	\$29,274	\$0	\$69,091	\$72,999	-\$3,908						
60	\$10,000	\$23,957	\$7,052	\$29,274	\$0	\$70,283	\$75,919	-\$5,636						
61	\$10,000	\$24,916	\$7,334	\$29,274	\$0	\$71,524	\$78,956	-\$7,432						
62	\$10,000	\$25,912	\$7,627	\$29,274	\$17,000	\$89,814	\$82,114	\$7,700						
63	\$10,000	\$26,949	\$7,933	\$29,274	\$17,510	\$91,665	\$85,399	\$6,267						
64	\$10,000	\$28,027	\$8,250	\$29,274	\$18,035	\$93,586	\$88,815	\$4,771						
65	\$10,000	\$29,148	\$8,580	\$0	\$18,576	\$66,304	\$92,367	-\$26,063						
66	\$10,000	\$30,314	\$8,923	\$0	\$19,134	\$68,371	\$96,062	-\$27,691						
67	\$10,000	\$31,526	\$9,280	\$0	\$19,708	\$70,514	\$99,904	-\$29,390						
68	\$0	\$32,787	\$9,651	\$0	\$20,299	\$62,737	\$103,901	-\$41,163						
69	\$0	\$34,099	\$10,037	\$0	\$20,908	\$65,044	\$108,057	-\$43,013						
70	\$0	\$35,463	\$10,439	\$0	\$21,535	\$67,437	\$112,379	-\$44,942						
71	\$0	\$36,881	\$10,856	\$0	\$22,181	\$69,919	\$116,874	-\$46,955						
72	\$0	\$38,357	\$11,291	\$0	\$22,847	\$72,494	\$121,549	-\$49,055						
73	\$0	\$39,891	\$11,742	\$0	\$23,532	\$75,165	\$126,411	-\$51,246						
74	\$0	\$41,487	\$12,212	\$0	\$24,238	\$77,936	\$131,467	-\$53,531						
75	\$0	\$43,146	\$12,700	\$0	\$24,965	\$80,811	\$136,726	-\$55,915						
76	\$0	\$44,872	\$13,208	\$0	\$25,714	\$83,794	\$142,195	-\$38,401						
77	\$0	\$46,667	\$13,737	\$0	\$26,485	\$86,889	\$147,883	-\$60,994						

			Арр	endix HI - wo	ork part time d	uring retiren	nent					
78	\$0	\$48,533	\$14,286	\$0	\$27,280	\$90,100	\$153,798	-\$63,699				
79	\$0	\$50,475	\$14,858	\$0	\$28,098	\$93,431	\$159,950	-\$66,519				
80	\$0	\$52,494	\$15,452	\$0	\$28,941	\$96,887	\$166,348	-\$69,461				
81	\$0	\$54,593	\$16,070	\$0	\$29,810	\$100,473	\$173,002	-\$72,529				
82	\$0	\$56,777	\$16,713	\$0	\$30,704	\$104,194	\$179,922	-\$75,728				
83	\$0	\$59,048	\$17,381	\$0	\$31,625	\$108,055	\$187,119	-\$79,065				
84	\$0	\$61,410	\$18,077	\$0	\$32,574	\$112,060	\$194,604	-\$82,543				
85	\$0	\$63,867	\$18,800	\$0	\$33,551	\$116,217	\$202,388	-\$86,171				
86	\$0	\$66,421	\$19,552	\$0	\$34,557	\$120,530	\$210,484	-\$89,953				
87	\$0	\$69,078	\$20,334	\$0	\$35,594	\$125,006	\$218,903	-\$93,897				
88	\$0	\$71,841	\$21,147	\$0	\$36,662	\$129,650	\$227,659	-\$98,009				
89	\$0	\$74,715	\$21,993	\$0	\$37,762	\$134,470	\$236,765	-\$102,296				
90	\$0	\$77,704	\$22,873	\$0	\$38,895	\$139,471	\$246,236	-\$106,765				
91	\$0	\$80,812	\$23,787	\$0	\$40,062	\$144,661	\$256,085	-\$111,425				
92	\$0	\$84,044	\$24,739	\$0	\$41,263	\$150,047	\$266,329	-\$116,282				
93	\$0	\$87,406	\$25,729	\$0	\$42,501	\$155,636	\$276,982	-\$121,346				
94	\$0	\$90,902	\$26,758	\$0	\$43,776	\$161,436	\$288,061	-\$126,625				
95	\$0	\$94,538	\$27,828	\$0	\$45,090	\$167,456	\$299,584	-\$132,128				
Conclu	ision:	This option amount of This low le He still has	results slight in money for a rela vel of earnigs wi a deficit in most	nprovement b tively short p ll not cause h : years (all ex	ecause he is on eriod of time is Social Securi cept three).	ly working fo	or a small) be reduced.					

Appendix I - delay taking Social Security retirement benefits until full retirement age (66)													
Assumptions	:	Ŀ	nflation = 4%	Rate of return=	7%	Life expect.=	95						
		Withdrawal rate=	= 5%	Raises=	4%	SS Cola	3%						
Delaying takir increase first y	ng Social Sec year benefits	urity retirement b from \$17,000 to \$	enefits until a 822,500.	ge 66 (his full b	enefit retiren	nent age) will							
Work = Enter the phased retirement program at 55, work 50% for three years, retire fully from college								Total	Pymt/B				
403 (b) =	\$ 400,000	FV at age 55	\$ 428,000	additions of	\$15,000	FV additions	\$15,000	\$443,000	5% withdrawal rate				
IRA =	\$ 120,000	FV at age 55	\$ 128,400	additions of	\$2,000	FV additions	\$2,000	\$130,400	5% withdrawal rate				
Taxable inv.	\$ 200,000	FV at age 55	\$ 214,000	additions of	\$6,000	FV additions	\$6,000	\$220,000	10 yr.payout				
Sources:													

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	Appendix I - delay taking Social Security retirement benefits until full retirement age (66)												
Age	Work	403(b)	IRA	Taxable inv.	SS	TOTAL	Live.Exp	Surp/Def					
54	\$60,000	\$0	\$0	\$0		\$60,000	\$60,000	\$0					
55	\$30,900	\$0	\$0	\$29,274		\$60,174	\$62,400	-\$2,226					
56	\$31,827	\$0	\$0	\$29,274		\$61,101	\$64,896	-\$3,795					
57	\$32,782	\$0	\$0	\$29,274		\$62,056	\$67,492	-\$5,436					
58	\$0	\$22,150	\$6,520	\$29,274		\$57,944	\$70,192	-\$12,248					
59	\$0	\$23,036	\$6,781	\$29,274		\$59,091	\$72,999	-\$13,908					
60	\$0	\$23,957	\$7,052	\$29,274		\$60,283	\$75,919	-\$15,636					
61	\$0	\$24,916	\$7,334	\$29,274		\$61,524	\$78,956	-\$17,432					
62	\$0	\$25,912	\$7,627	\$29,274		\$62,814	\$82,114	-\$19,300					
63	\$0	\$26,949	\$7,933	\$29,274		\$64,155	\$85,399	-\$21,243					
64	\$0	\$28,027	\$8,250	\$29,274		\$65,551	\$88,815	-\$23,264					
65	\$0	\$29,148	\$8,580	\$0		\$37,728	\$92,367	-\$54,639					
66	\$0	\$30,314	\$8,923	\$0	\$22,500	\$61,737	\$96,062	-\$34,325					
67	\$0	\$31,526	\$9,280	\$0	\$23,175	\$63,981	\$99,904	-\$35,923					
68	\$0	\$32,787	\$9,651	\$0	\$23,870	\$66,309	\$103,901	-\$37,592					
69	\$0	\$34,099	\$10,037	\$0	\$24,586	\$68,723	\$108,057	-\$39,334					
70	\$0	\$35,463	\$10,439	\$0	\$25,324	\$71,226	\$112,379	-\$41,153					
71	\$0	\$36,881	\$10,856	\$0	\$26,084	\$73,821	\$116,874	-\$43,053					
72	\$0	\$38,357	\$11,291	\$0	\$26,866	\$76,513	\$121,549	-\$45,036					
73	\$0	\$39,891	\$11,742	\$0	\$27,672	\$79,305	\$126,411	-\$47,106					
74	\$0	\$41,487	\$12,212	\$0	\$28,502	\$82,201	\$131,467	-\$49,267					
75	\$0	\$43,146	\$12,700	\$0	\$29,357	\$85,204	\$136,726	-\$51,522					
76	\$0	\$44,872	\$13,208	\$0	\$30,238	\$88,318	\$142,195	-\$53,877					
77	\$0	\$46,667	\$13,737	\$0	\$31,145	\$91,549	\$147,883	-\$56,334					
78	\$0	\$48,533	\$14,286	\$0	\$32,080	\$94,899	\$153,798	-\$58,899					
79	\$0	\$50,475	\$14,858	\$0	\$33,042	\$98,374	\$159,950	-\$61,576					
80	\$0	\$52,494	\$15,452	\$0	\$34,033	\$101,979	\$166,348	-\$64,369					
81	\$0	\$54,593	\$16,070	\$0	\$35,054	\$105,718	\$173,002	-\$67,284					
82	\$0	\$56,777	\$16,713	\$0	\$36,106	\$109,596	\$179,922	-\$70,326					
83	\$0	\$59,048	\$17,381	\$0	\$37,189	\$113,619	\$187,119	-\$73,500					
84	\$0	\$61,410	\$18,077	\$0	\$38,305	\$117,791	\$194,604	-\$76,812					
85	\$0	\$63,867	\$18,800	\$0	\$39,454	\$122,120	\$202,388	-\$80,268					
86	\$0	\$66,421	\$19,552	\$0	\$40,638	\$126,610	\$210,484	-\$83,873					
87	\$0	\$69,078	\$20,334	\$0	\$41,857	\$131,268	\$218,903	-\$87,635					
88	\$0	\$71,841	\$21,147	\$0	\$43,112	\$136,101	\$227,659	-\$91,558					
89	\$0	\$74,715	\$21,993	\$0	\$44,406	\$141,113	\$236,765	-\$95,652					
90	\$0	\$77,704	\$22,873	\$0	\$45,738	\$146,314	\$246,236	-\$99,922					

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	Appendix I - delay taking Social Security retirement benefits until full retirement age (66)														
L	Appendix 1 - deny taking both better the enternet benefits and the remember age (00)														
91	\$0	\$80,812	\$23,787	\$0	\$47,110	\$151,709	\$256,085	-\$104,376	 						
92	\$0	\$84,044	\$24,739	\$0	\$48,523	\$157,306	\$266,329	-\$109,022							
93	93 \$0 \$87,406 \$25,729 \$0 \$49,979 \$163,113 \$276,982 -\$113,869														
94	\$0	\$90,902	\$26,758	\$0	\$51,478	\$169,138	\$288,061	-\$118,923							
95	\$0	\$94,538	\$27,828	\$0	\$53,023	\$175,389	\$299,584	-\$124,195							
Conclu	onclusion: This option results in higer deficits for the first four years of his retirement because he is delaying the receipt of his Social Security Retirement benefits. However all deficits from age 66 on will be smaller because his Social Security benefits will be higher for the remainder of his life.														

	Appendix J - reduce retirement expenses 15%											
	Assumptions	:	Inflation =	4%	Rate of returr	n= 7%	Life expect.=	95				
			Withdrawal r	ate= 5%	Raises= 49	6	SS Cola 39	6				
	Work = Enter the pha		used retiremen	t program at 5	5, work 50% i	for three years	, retire fully fr	om college		Total	Pymt/B	
	403 (b) =	\$ 400,000	FV at age 55	\$ 428,000	additions of	\$15,000	FV additions	\$15,000	\$	443,000	5% withdrawal rate	
	IRA =	\$ 120,000	FV at age 55	\$ 128,400	additions of	\$2,000	FV additions	\$2,000	\$	130,400	5% withdrawal rate	
	Taxable inv.	\$ 200,000	FV at age 55	\$ 214,000	additions of	\$6,000	FV additions	\$6,000	\$	220,000	10 yr.payout	
		We will assu	me that Profes	sor Paul will I	be able to redu	ice retirement	expenses					
		to 85% of the amount that he originally projected										
	Sources:											
Age	Work	403(b)	IRA	Taxable inv.	SS	TOTAL	Live.Exp	Surp/Def				
54	\$60,000	\$0	\$0	\$0	\$0	\$60,000	\$60,000	\$0				
55	\$30,900	\$0	\$0	\$29,274	\$0	\$60,174	\$53,040	\$7,134				
56	\$31,827	\$0	\$0	\$29,274	\$0	\$61,101	\$55,162	\$5,939				
57	\$32,782	\$0	\$0	\$29,274	\$0	\$62,056	\$57,368	\$4,688				
58	\$0	\$22,150	\$6,520	\$29,274	\$0	\$57,944	\$59,663	-\$1,719				
59	\$0	\$23,036	\$6,781	\$29,274	\$0	\$59,091	\$62,049	-\$2,958				
60	\$0	\$23,957	\$7,052	\$29,274	\$0	\$60,283	\$64,531	-\$4,248				
61	\$0	\$24,916	\$7,334	\$29,274	\$0	\$61,524	\$67,113	-\$5,589				
62	\$0	\$25,912	\$7,627	\$29,274	\$17,000	\$79,814	\$69,797	\$10,017				
63	\$0	\$26,949	\$7,933	\$29,274	\$17,510	\$81,665	\$72,589	\$9,077				
64	\$0	\$28,027	\$8,250	\$29,274	\$18,035	\$83,586	\$75,492	\$8,094				
65	\$0	\$29,148	\$8,580	\$0	\$18,576	\$56,304	\$78,512	-\$22,208				
66	\$0	\$30,314	\$8,923	\$0	\$19,134	\$58,371	\$81,653	-\$23,282				
67	\$0	\$31,526	\$9,280	\$0	\$19,708	\$60,514	\$84,919	-\$24,405				

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	Appendix J - reduce retirement expenses 15%									
68	\$0	\$32,787	\$9,651	\$0	\$20,299	\$62,737	\$88,315	-\$25,578		
69	\$0	\$34,099	\$10,037	\$0	\$20,908	\$65,044	\$91,848	-\$26,804		
70	\$0	\$35,463	\$10,439	\$0	\$21,535	\$67,437	\$95,522	-\$28,085		
71	\$0	\$36,881	\$10,856	\$0	\$22,181	\$69,919	\$99,343	-\$29,424		
72	\$0	\$38,357	\$11,291	\$0	\$22,847	\$72,494	\$103,317	-\$30,823		
73	\$0	\$39,891	\$11,742	\$0	\$23,532	\$75,165	\$107,449	-\$32,284		
74	\$0	\$41,487	\$12,212	\$0	\$24,238	\$77,936	\$111,747	-\$33,811		
75	\$0	\$43,146	\$12,700	\$0	\$24,965	\$80,811	\$116,217	-\$35,406		
76	\$0	\$44,872	\$13,208	\$0	\$25,714	\$83,794	\$120,866	-\$37,072		
77	\$0	\$46,667	\$13,737	\$0	\$26,485	\$86,889	\$125,700	-\$38,812		
78	\$0	\$48,533	\$14,286	\$0	\$27,280	\$90,100	\$130,729	-\$40,629		
79	\$0	\$50,475	\$14,858	\$0	\$28,098	\$93,431	\$135,958	-\$42,527		
80	\$0	\$52,494	\$15,452	\$0	\$28,941	\$96,887	\$141,396	-\$44,509		
81	\$0	\$54,593	\$16,070	\$0	\$29,810	\$100,473	\$147,052	-\$46,579		
82	\$0	\$56,777	\$16,713	\$0	\$30,704	\$104,194	\$152,934	-\$48,740		
83	\$0	\$59,048	\$17,381	\$0	\$31,625	\$108,055	\$159,051	-\$50,997		
84	\$0	\$61,410	\$18,077	\$0	\$32,574	\$112,060	\$165,413	-\$53,353		
85	\$0	\$63,867	\$18,800	\$0	\$33,551	\$116,217	\$172,030	-\$55,813		
86	\$0	\$66,421	\$19,552	\$0	\$34,557	\$120,530	\$178,911	-\$58,381		
87	\$0	\$69,078	\$20,334	\$0	\$35,594	\$125,006	\$186,067	-\$61,061		
88	\$0	\$71,841	\$21,147	\$0	\$36,662	\$129,650	\$193,510	-\$63,860		
89	\$0	\$74,715	\$21,993	\$0	\$37,762	\$134,470	\$201,251	-\$66,781		
90	\$0	\$77,704	\$22,873	\$0	\$38,895	\$139,471	\$209,301	-\$69,830		
91	\$0	\$80,812	\$23,787	\$0	\$40,062	\$144,661	\$217,673	-\$73,012		
92	\$0	\$84,044	\$24,739	\$0	\$41,263	\$150,047	\$226,379	-\$76,333		
93	\$0	\$87,406	\$25,729	\$0	\$42,501	\$155,636	\$235,435	-\$79,799		
94	\$0	\$90,902	\$26,758	\$0	\$43,776	\$161,436	\$244,852	-\$83,416		
95	\$0	\$94,538	\$27,828	\$0	\$45,090	\$167,456	\$254,646	-\$87,190		
Concl	usion:	This option It is a deriv	results in sig ative of the o	gnificant imp Id 70-80% ru ame standard	rovement sinc ile used for re l of living with	e it impacts a tirement plan h that range (all of his retire nning which n	ement years naintained th	at ome.	
		It is increas	sed five perce	ent to reflect l	his desire to m	aintain two l	nomes.	in ement meu	/	

	Appendix K - Recommended Option										
		A combination of options									
	Assumptions	5:	Inflation =	4%	Rate of return=	= 7%	Life expect.=	95			
			Withdrawal rate	= 5%	Raises=	4%	SS Cola	3%			
		This option v	will allow Profess	sor Paul to con	ntribute to his r	etirement acc	counts for 3 mor	re years.			
		This will also	o allow him to taj	o into his taxa	ble accounts ac	counts three	years later				
		This will also allow him to tap into his retirement accounts much later									
		This option v									
		He will work									
		This option v									
		This option v									
		This option v	will allow him to	earn in retirer	nent and rely le	ess on his reti	rement account	S			
		This option v	will cause him to	reduce his pla	nned retiremer	it expenses 1	5%				
	Work =	Enter the ph	ased retirement p	orogram at 58,	work 50% for	three years, i	etire fully from	college	Total	Pymt/B	
	403 (b) =	\$ 400,000	FV at age 68	\$1,031,414	additions of	\$22,000	FV additions	\$200,884	\$ 1,232,298	5%	
										withdrawa l rate	
	IRA =	\$ 120,000	FV at age 68	\$ 309,424	additions of	\$6,000	FV additions	\$39,304	\$ 348,728	5%	
					v					withdrawa	
	m 11 ·	¢ 2 00.000		• • • • • • • • • • • • • • • • • • •	1.1	¢<.000	TT 7 1 1 1	00 0000	* 2 00 7 00	l rate	
	l axable inv.	\$ 200,000	FV at age 58	\$ 262,159	additions of	\$6,000	FV additions	\$26,640	\$ 288,799	10 yr.payout	
	Sources:										
Age	Work	403(b)	IRA	Taxable	SS	TOTAL	Live.Exp	Surp/Def			
				inv.							
54	\$60,000				\$0	\$60,000	\$60,000	\$0			
55	\$62,400				\$0	\$62,400	\$62,400	\$0			
56	\$64,896				\$0	\$64,896	\$64,896	\$0			
57	<mark>\$67,492</mark>				\$0	\$67,492	\$67,492	\$0			
58	\$35,096			\$38,429	\$0	\$73,525	\$59,663	\$13,862			
59	\$36,500			\$38,429	\$0	\$74,929	\$62,049	\$12,879			
60	\$37,960			\$38,429	\$0	\$76,389	\$64,531	\$11,857			
61	\$39,098			\$38,429	\$0	\$77,527	\$67,113	\$10,415			
62	\$40,271			\$38,429	\$17,000	\$95,700	\$69,797	\$25,903			
63	\$10,000			\$38,429	\$17,510	\$65,939	\$72,589	-\$6,650			
64	\$10,000			\$38,429	\$18,035	\$66,464	\$75,492	-\$9,028			
65	\$10,000			\$38,429	\$18,576	\$67,005	\$78,512	-\$11,507			
66	\$10,000			\$38,429	\$19,134	\$67,563	\$81,653	-\$14,090			
67	\$10,000			\$38,429	\$19,708	\$68,137	\$84,919	-\$16,782			
68	\$10,000	\$61,615	\$17,436	\$0	\$20,299	\$109,350	\$88,315	\$21,035			
69	\$10,000	\$64,079	\$18,134	\$0	\$20,908	\$113,121	\$91,848	\$21,273			

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	Appendix K - Recommended Option									
70	\$10,000	\$66,643	\$18,859	\$0	\$21,535	\$117,037	\$95,522	\$21,515		
71	\$10,000	\$69,308	\$19,614	\$0	\$22,181	\$121,103	\$99,343	\$21,760		
72	\$10,000	\$72,081	\$20,398	\$0	\$22,847	\$125,325	\$103,317	\$22,009		
73	\$0	\$74,964	\$21,214	\$0	\$23,532	\$119,710	\$107,449	\$12,261		
74	\$0	\$77,962	\$22,063	\$0	\$24,238	\$124,263	\$111,747	\$12,516		
75	\$0	\$81,081	\$22,945	\$0	\$24,965	\$128,991	\$116,217	\$12,774		
76	\$0	\$84,324	\$23,863	\$0	\$25,714	\$133,901	\$120,866	\$13,035		
77	\$0	\$87,697	\$24,817	\$0	\$26,485	\$139,000	\$125,700	\$13,300		
78	\$0	\$91,205	\$25,810	\$0	\$27,280	\$144,295	\$130,729	\$13,567		
79	\$0	\$94,853	\$26,843	\$0	\$28,098	\$149,794	\$135,958	\$13,837		
80	\$0	\$98,647	\$27,916	\$0	\$28,941	\$155,505	\$141,396	\$14,109		
81	\$0	\$102,593	\$29,033	\$0	\$29,810	\$161,436	\$147,052	\$14,384		
82	\$0	\$106,697	\$30,194	\$0	\$30,704	\$167,595	\$152,934	\$14,661		
83	\$0	\$110,965	\$31,402	\$0	\$31,625	\$173,992	\$159,051	\$14,941		
84	\$0	\$115,404	\$32,658	\$0	\$32,574	\$180,635	\$165,413	\$15,222		
85	\$0	\$120,020	\$33,964	\$0	\$33,551	\$187,535	\$172,030	\$15,505		
86	\$0	\$124,820	\$35,323	\$0	\$34,557	\$194,701	\$178,911	\$15,790		
87	\$0	\$129,813	\$36,736	\$0	\$35,594	\$202,143	\$186,067	\$16,076		
88	\$0	\$135,006	\$38,205	\$0	\$36,662	\$209,873	\$193,510	\$16,363		
89	\$0	\$140,406	\$39,733	\$0	\$37,762	\$217,901	\$201,251	\$16,651		
90	\$0	\$146,022	\$41,323	\$0	\$38,895	\$226,240	\$209,301	\$16,939		
91	\$0	\$151,863	\$42,976	\$0	\$40,062	\$234,900	\$217,673	\$17,228		
92	\$0	\$157,938	\$44,695	\$0	\$41,263	\$243,896	\$226,379	\$17,516		
93	\$0	\$164,255	\$46,483	\$0	\$42,501	\$253,239	\$235,435	\$17,804		
94	\$0	\$170,825	\$48,342	\$0	\$43,776	\$262,944	\$244,852	\$18,092		
95	\$0	\$177,658	\$50,276	\$0	\$45,090	\$273,024	\$254,646	\$18,377		
Conclu	Conclusion: This plan works but it relies on using a number of options. None of the individual options considered alone accomplishes the job.									

results in a surplus in all years but five and those deficits can be dealt with

by saving the previous surpluses.

The surpluses starting at age 68 can be invested for a "rainy day fund" or to leave a legacy for any heirs.

THE MERGER OF AOL AND TIME WARNER: A CASE STUDY

David Malone, Weber State University James Turner, Weber State University

CASE DESCRIPTION

The purposes of this case are several, and the potential uses fairly rich. From an accounting perspective, the assignment of a value to the transaction will directly affect the goodwill assigned to the merged firm's financial statements. From that, students can be given the opportunity to discuss such topics as measurement, earnings management, and efficiency with respect to analysts' capacity to filter through non-cash flow effects.

Interesting questions arise with respect to the adequacy of information about the probability of merger completion. Evidence suggests that analysts assigned a fairly high probability to the chance that the merger would not be completed. The fairness of this probability allows for speculation as to whether or not information available in the market, including that disseminated by the firm, was adequate to the task of assigning that probability.

Finally, because the case involved two very widely held firms, there are rich opportunities for students to research the wealth of information that exists on this merger.

At its highest level, the case is rich enough to be used for Masters of Accounting students and MBA students who have taken an MBA-level corporate finance class. Upper division accounting and finance students who are familiar with analysis of mergers and with theories of asymmetric information could also benefit from analyzing the case.

CASE SYNOPSIS

When AOL and Time Warner announced their proposed merger in January 2000, the securities of both firms experienced significant price adjustments. Initially, prices of both securities rose on the news. When details of the proposal became clear, the security price of Time Warner fell back somewhat, but remained approximately 30% above its pre-announcement selling price. AOL shares, however, retreated to a price about 15% below its pre-announcement price. Both of these prices were significantly below consensus price targets set by analysts.

Of special interest is the relative price level at which the two securities settled soon after the announcement. The merger proposal called for the issuance of a new security representing common ownership in the new firm. One share of the new security would be issued for each share of AOL, while each share of Time Warner would be exchanged for one and one-half shares of the new security. As weeks passed beyond the announcement date, the ratio of the Time Warner shares to the AOL shares ranged from just less

than 1.4:1 to 1.5:1 (rather than settling at and sustaining the 1.5:1 ratio one would expect from the agreement.)

This case presents the circumstances surrounding the merger of AOL and Time Warner, including their respective business strategies, markets, financial structures, and price movements during the period leading up to the merger.

INSTRUCTORS' NOTES

Discussion Questions

1. What synergies exist in the combination of AOL/TWX?

Discuss the implications of combining a high growth, volatile company like AOL with a more established, less volatile company like TWX. This has significant implications for the expected stock price in the post-merger market. One expects that if no synergies exist, forecasted post-merger cash flows would approximate the sum of the forecasted cash flows of the pre-merger firms. In this case, AOL and TWX bring significant contributions to the other. AOL offers TWX an established web presence, and thus a channel of distribution for its current media products, as well as the potential for expanded on-demand distribution of its film and television media through the internet.

TWX offers AOL two significant assets in its broadband capacity and content. The vision is that through the combination of AOL and TWX, consumers will have instant and deep access to every broadcast and print media known.

Another interesting synergy not mentioned in the case is the management combination that results from the merger. Steve Case, founder, chair and CEO of AOL was named chair of the combined firm. Simultaneously, Gerald Levin, chair and CEO of TWX was named as CEO of the combined entity. Parallel to the discussion of synergies emerging from the combination of the firms, similar points can be made of the merger of the two management styles. AOL management represented (in general) a creative and young management style, while TWX management was accustomed to managing a diverse, complex international entity. The combined firm, investors would speculate, needed both qualities.

2. What evidence of capital market efficiencies or lack thereof exists in the AOL/TWX merger?

Point out the initial price ratios of the two securities. Emphasize the slow adjustment from the initial ratio (at the announcement date close) of 1.26:1 to the eventual levels indicated. Early after the announcement, as indicated in the case, several pronouncements were made to ease fears the merger would not be completed. After that, very little new information made its way into the financial press to suggest that there remained doubts about the completion of the merger, and in fact, that same press began to refer to AOL TWX in their completed, combined form. In the interim, the price ratio of the two securities remained in approximately the 1.40 to 1.46 range, and was relatively volatile within that range. Students may benefit from a mathematical example of how even the small investor could potentially benefit from that arbitrage spread. Perhaps as follows:

On March 30, AOL and TWX finished the day at 65 and 90.75 respectively. If one purchased 100 shares of TWX, the cost would be \$9,075, while 150 shares of AOL (the equivalent, presumably, to 100 shares of TWX) would cost \$9,750. If the price of AOL remained constant at that level through the merger completion date, the AOL investment would not increase in value, whereas the supposedly equivalent (and equally risky) TWX investment would increase in value by 675 (9,750 - 99,075). If the price of AOL rose to 75 on the merger completion date, the AOL investment would net \$2,187.50. If the price of AOL fell to 55 on the merger completion date, the TWX investment would net set 1,500, while the TWX investment would net set 1,500. The TWX investment makes more than the AOL investment if the postmerger price rises and loses less than the AOL investment if the post-merger price falls.

In fact, an investor could make a positive profit through arbitrage no matter what happens to the price of AOL stock after the merger. (An investor earns an arbitrage profit if she is able to earn a profit without placing any of her own money at risk.) The strategy in this case would be to short 150 shares of AOL and receive \$9,750. Take \$9,075 of the proceeds from the short sale to purchase 100 shares of TWX. After the merger, the investor's 100 shares of TWX will become 150 shares of the new company, which the investor can use to cover the short sale. The investor had none of her own funds invested, but will make a profit of \$675, no matter what happens to the price of AOL stock.

Remind students that because investors have powerful incentives to act on arbitrage opportunities, a conclusion that markets are inefficient requires more than simply pointing out the existence of an apparent arbitrage opportunity. Encourage students to explore explanations other than market inefficiency that might account for the slow adjustment of the price ratio.

One reason that the price ratio would not immediately settle in at 1.5 is that investors may have believed the merger would not be completed. One can construct an example to calculate a rough estimate of the probability that the merger will be completed. For a risk neutral investor, the expected return of any investment should equal the risk-free rate. During March 2000, the rate of one year Treasury Bills was 5.75%. The following equations set the expected returns of an investment in TWX equal to the risk-free rate. Assuming that prices would return to the pre-announcement levels if the merger were not completed, we have

$$\frac{Mp+64.75(1-p)}{65} = \frac{1.5Mp+72.875(1-p)}{90.75} = 1.0575,$$

where M is the post-merger price, p is the probability the merger will occur, and we assume the merger will take place one year later. (Pre-announcement prices are taken from Appendix A.) Solving the equations simultaneously gives a post-merger price estimate of \$70.40 and a probability estimate of 70.6%, which is an estimate (for this particular day) of the probability the merger will be completed. By substituting the prices of AOL and TWX on other days as the price ratio varies, one can demonstrate the volatility of this probability. If we assume that the calculated probability

accurately captures the market's perception of the probability of the merger being completed, such that equilibrium is reached through these prices, arguments (or at least a very lively discussion) can be made of the strength of efficiency in this particular market.

Given the relatively low estimate of the probability that the merger would be completed (which admittedly is a subjective conclusion,) students can be asked to either support the probability that emerged, or speculate as to why the market failed to produce a more "reasonable" probability.

Encourage students to think about why the AOL share price falls after the merger announcement and whether this price fall is a "correct" response to the merger announcement. Students familiar with theories of asymmetric information may notice that the fall in the AOL share price is consistent with an information asymmetry between the market and AOL executives. If AOL executives are uncertain about the value of synergies from the merger, they would favor a stockfinanced merger over a cash-financed merger. In addition, if AOL executives are aware that the market price of AOL shares is too high relative to fundamental values (as was suggested in the later shareholder lawsuits), they would also favor financing the merger with stock rather than with cash. Once the market learns of the merger and that the merger will be financed by stock, the AOL share price falls. There are therefore two possible reasons for the immediate fall in the AOL share price. The market now believes that AOL shares were overvalued and/or that AOL is paying too much for the merger.

3. Discuss the difficulties of initially estimating the negotiated exchange value in the merger of a volatile, highly growth-oriented firm with a stable, moderate growth firm?

Discuss the markets for the firms. Emphasize the forward looking, growth-oriented market of AOL, the steady growth established industry of TWX, and the uncertainty of the nature of the combined firm (i.e., will the merged firm assume more the character of AOL or TWX.)

An interesting consideration is whether the merged firm will continue to pay the dividend that TWX paid before the merger. An interesting discussion might follow the logic that a rapid growth strategy (i.e., the strategy of AOL) generally calls for 100% reinvestment of cash flows, while the dividend policy followed by TWX is typical of more mature firms. There is evidence in the case in support of this discussion. As indicated, AOL currently is reinvesting all of its operating cash flows, as well as financing growth through the acquisition of additional debt. TWX, in contrast, is using its cash flows in part to finance new growth, but also to pay down debt and pay dividends. In the post-merger world for AOL-TWX, what strategies might be followed on reinvestment and why?

As discussed in Question 2 above, Steve Case, in taking over the board responsibilities, gives up the management reins of the combined firm. Steve Case, as one might guess, was the stimulus behind the creativity and growth orientation associated with AOL, while Gerald Levin was certainly more schooled in steering the colossus that was TWX. At the time of the announcement, the financial press strongly suggested that the decision on management responsibilities foretold a movement away from the rapid growth strategy of AOL.

Remind students that since the merger is financed by stock, the cost of the merger to AOL shareholders (and the benefits received by TWX shareholders) depends on the value of the combined

firm after the merger and on the values of the individual firms before the merger. With volatile stock prices, the costs and benefits of the merger will not be known until the merger takes place.

Unlike a merger that is financed by cash, the value that TWX shareholders receive when the merger takes place depends on the price of the stock of the merged firm, and thereby on the price of AOL stock. Since AOL is a growth oriented firm, its share price will depend more on the market's perception of its growth opportunities than on its current cash flows. Given AOL's share price volatility, by the time the merger takes place, the monetary value of what TWX shareholders receive from the merger could be much different than what they first anticipated receiving.

Some students may suggest that AOL's share price was unrealistically high at the time of the merger discussions, so that an exchange ratio of 1.5 is unfair to TWX shareholders. If that were the case, students might suggest that analysts could have independently established the value of both firms using a discounted cash flow analysis and used the results to establish the "correct" exchange ratio. But again, for growth firms the valuation will depend critically on the estimate of growth. Any error in this estimate will be multiplied in the valuation estimate.

4. In this merger only stock was exchanged. Under the purchase method of accounting for business combinations, goodwill must be recognized and amortized. What are the implications for earnings of the merger?

In a pure exchange of stock, there is economic goodwill represented on both sides of the exchange (i.e., both AOL and TWX are realizing excess share value not captured in book value.) The most important aspect is the negotiated value of the two securities upon which the ratio of shares issued will be based. In this case, it is clear that the initial valuation favored TWX. Holders of TWX on the date of the announcement realized a 38.6% increase in value, while holders of AOL realized a decrease of 3.7% in value. While TWX nearly retained its early gains, AOL stock experienced a total decline of 22% over the four-week period following the announcement (followed by a slow and steady recovery).

5. Referring to Appendix B, one observes that the ratio of TWX:AOL prices ranged from just below 1.4:1 (allowing for an initial settling period) to above 1.5:1. What implications for accounting are there in the seeming persistent lack of stability of that ratio?

This issue prompted the writing of this case. The apparent lack of stability in this ratio indicates a high level of uncertainty as to the ultimate completion of this merger. Two interesting points are raised by this question. First, in a capital market exhibiting characteristics of strong form efficiency, the price ratio would very quickly settle at a level that correctly reflected the probabilities associated with a) the merger being completed, b) the timeframe to complete the merger, and c) price levels to which the respective shares would move in the event the merger were not completed. That level would, presumably, be somewhat less than 1.5:1 and would slowly move toward 1.5:1, with occasional spikes in reaction to approvals by the FTC, the respective boards, and the respective groups of shareholders.) Clearly, this was not the case here. The ratio, weeks after the announcement varied widely, even going higher than 1.5:1 (if we assume that prices would return

to pre-announcement levels in the case of a breakdown of the merger, this behavior of the ratio seems to be irrational.)

Second, financial disclosure, broadly defined, would appear to have had little effect on the markets for these two shares. Even in the face of statements supporting the merger being made by authoritative figures, ratio levels continued to fluctuate, indicating a general inability of the markets to digest this and other information.

6. Which firm is left better off? Is there a "winner" and/or a "loser"?

Under the merger agreement, AOL shareholders acquire 55% of the combined firm, with TWX acquiring 45%. There are compelling arguments to suggest that either firm might be the overall winner. Indeed, upon examination, popular message boards reveal a generally negative attitude toward the merger by followers of both AOL and TWX.

Disregarding the price movements by the two securities after the announcement, people will be split in their opinions regarding which firm emerges as the "winner" in this transaction. Some will argue that AOL's explosive growth rates will be hindered by the acquisition of a more traditional firm such as TWX. Others will argue that TWX is the only firm in this transaction with "real" value, i.e., more solid financial figures, such as significantly larger net asset value, revenue, and earnings.

Upon initial examination of the firms in the weeks following the merger announcement, TWX shareholders experienced a gain of 33% in value compared to a 22% loss in value experienced by AOL shareholders. This single fact would suggest that TWX shareholders were far and away the winners in this transaction and that the \$110 value assigned to their shares (resulting in the 1.5:1 trade value) was an overestimate.

AOL, however, acquired 55% of a combined firm whose net asset value, revenues, net earnings, and cash flows are derived primarily from TWX (see Appendix A.) AOL, a relatively young firm that operates in a very new and uncertain industry, whose securities have been subject to significant volatility, acquired a firm with a long record of steady of revenue and earnings growth operating in a stable industry. Also argued was AOL's capacity to sustain its historic growth rates. Emerging broad band cable access was not yet within AOL's grasp, and served as a threat to its market leading position in internet access. Acquisition of TWX by AOL brought with it extensive broad band capacity and the promise of avenues along which to continue its growth.

Ultimately, the combined firm lost a significant amount of market value, though it difficult to say with confidence that the merger itself is to blame for the losses. Since hindsight is always 20/20, encourage students to analyze the merger as if they were viewing it at the time, without the knowledge of what was to come later.

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