

NAME: \_\_\_\_\_ SECTION \_\_\_\_\_ DATE \_\_\_\_\_

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
SLOAN SCHOOL OF MANAGEMENT

15.402 Sections A, B, and C  
Finance Theory II  
Fall 2002

Exam courtesy of Prof.  
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**Rules: This Page Distributed in Advance**

- 1) Write your name, section, and date that you attend on the exam.
- 2) Show your work where necessary. While you are allowed a calculator, you demonstrate how you arrived at your answers in order to score points on the test.
- 3) No discussion about the exam with students who have not taken the exam.
- 4) No laptops.
- 5) Open book, open notes.
- 6) No discussion during the exam with anyone but the test proctor.
- 7) Pay attention to the point allocations in managing your time.
- 8) Good luck!

**ASTEROID PICTURES, INC.**

*“If Rock messes his first movie deal up, Asteroid will  
come crashing down to earth.”*

- A Wall Street stock analyst

Asteroid Pictures is a movie studio that was founded in 1948 in Hollywood, California by Maxwell Roid. Over the past fifty years the company has been quite successful. It has produced over 200 movies and has grown into a Fortune 500 company. Its trademark, a giant rock flying through space towards the earth at supersonic speeds, is recognized worldwide and its slogan – “it’s the end of the world as you know it!”- is second only to “got milk?” in popularity among consumers.

Earlier this month, after over 68 years in the movie business, Maxwell Roid decided to step down from the helm of the company and he handed the control of the studio over to his grandson, Max (Rock) Roid III. Rock is a recent graduate with a business degree from a top notch university but has little experience in the movie business. As the head of the movie studio, Rock’s primary responsibility will be to determine which pictures the studio should produce. Despite his lack of experience, Rock is confident that the skills he learned in his finance classes would enable him to successfully manage this multi-billion dollar business.

On his first day as the new studio president, Rock is asked to decide if the studio should go forward with its plans to produce a new movie. The movie, entitled “Zizanic,” is a fictional drama about two young lovers aboard a famous zeppelin that crashed. Given the recent popularity of drama meets disaster films, the industry buzz is that the movie has great promise.

Rock has a sinking feeling in his stomach. He realizes that he has a decision to make. By the end of the day he has to determine if the studio should go forward and make the movie. Otherwise, the writers can take the script to another studio. Assume that once Rock tells the writers he will make the movie, he cannot back out of his decision. In other words, he cannot buy the script and then not make the movie or pass on the script and then change his mind to make the movie. Rock is given a thick file folder full of information about the “Zizanic” project to review carefully.

**The Asteroid Files**

Asteroid Pictures is privately held but recent estimates put the equity market value at \$2 billion and book value of debt equal to \$1 billion and an average coupon of 5.5%. While Rock's family owns a significant portion of Asteroid Pictures, Inc. they have a well diversified portfolio of wealth. Recent gyrations in credit markets have pushed the asteroid bond prices down to a market value of \$93.50 / \$100 of face value. Asteroids' current credit rating is thought to be BBB. The company's marginal tax rate is 40%. Assume the company has other divisions that have positive pre-tax income. So if pre-tax income is negative, it can be used to reduce the taxable income of these other divisions.

The studio has already invested \$1.5 million into the movie by purchasing the *right* to buy the script and bringing in actors and actresses to audition for the parts. If Asteroid buys the script they would have to pay the script writers an additional \$3 million when they start shooting the movie. The movie would be shot on location in four different countries and production costs are expected to be \$50 million, all of which would be required to be paid by the company when shooting for the movie began. Production costs include paying the director and the cast (the star, Dino Dicapria, alone would get \$5 million), travel and lodging costs expenses, and any fees associated with the use of the property where they would be shooting. Also included in the \$50 million in production costs is \$3.2 million for the crew (e.g., make-up people, grips, carpenters) who are currently under contract with the studio and will get paid money regardless if Asteroid decides to make this picture or not. Not included in the production costs are the costumes used in the movie. These costumes originally cost \$500,000 and were purchased for a previous movie Asteroid made several years ago. Asteroid has already agreed to sell these costumes to a wax museum in Florida for \$300,000. They plan to invest the funds from the sale of these costumes in a project with relatively the same level of risk as the Zizanic movie. If they make the movie they will have to postpone the sale of the costumes for one year.

The studio's marketing people are estimating the movie would gross \$45 million in the first year of release. In the following year, when Zizanic is released on video, they expect to sell 500,000 videotapes. In the third year, video sales are projected to be 250,000 videotapes. After year three, revenues from the movie should be close to 0. These videotapes would be sold for \$20 each and the cost to making the videotape would be \$4 each. The company will require \$100,000 worth of videos in inventory beginning 1 year from today.

The Internal Revenue Service will allow Asteroid to depreciate the cost of the script and incremental production costs. The company plans on depreciating these costs to zero over three years using the straight line method of depreciation. Also, the company expects to sell items from the production of the movie for \$1,000,000 in year three and consider this to be the salvage value from the project.

The company also expects that once the movie is released, the video sales of the other movies they have made previously starring Dino Dicapria should also increase. If the studio does not make Zizanic, these other videos have annual net profits of \$2 million a year and would remain at that level forever. If they do make the Zizanic, in the first three years following the release of Zizanic the net profits from these other videos are predicted to increase to \$3.5 million. After year three, net profits of the videos for other movies would return to \$2 million a year. Mr. Dicapria has made three movies for another studio, not associated with Asteroid and the video sales

of these movies are also expected to increase by \$500,000 per year for three years following the release of the Zizanic.

Rock also found a table of information about other companies in the folder labeled Table 1.

TABLE 1  
Zizanic Project Data

	<b>MGM / Mirage Casinos</b>	<b>Disney</b>	<b>Pixar</b>	<b>Harrahs' Casinos</b>
Book Equity	2.7 B	23.3 B	.629 B	1.5 B
Book Debt	5.2 B	14.6 B	0.0 B	3.5 B
Average Coupon on LT Debt	6.7%	5.8%	n.a.	7.0%
Shares Outstanding	155 M	1.95 B	.05 B	.11B
Stock Price per share	\$33.00	\$18.15	57.70	\$39.00
YTM on Recent Debt Issue	n.a.	5.0%	0	5.8%
Bond Rating	BB	A	n.a.	BBB
Tax Rate	35%	35%	35%	35%
Annualized Volatility	.40	.35	.42	.40
P/E	19	28	35	14
P/Sales	1.3	1.4	16	1.1
Proportion in Film Business	50%	20%	90%	0.0%
Equity Beta (estimated w/ daily returns)	.90	1.10	1.00	.80
Equity Beta (Estimated w/ monthly re- turns)	1.20	.95	1.30	.90

<b>Current Credit Market Conditions</b>	
Ten year BB Industrial Yield	6.50%
Ten year AAA Industrial Yield	4.80%
Ten year Government Yield	4.10%
Two year Government Yield	2.00%

## YOUR ASSIGNMENT: DON'T LET ASTEROID CRASH TO EARTH

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- 1) (10 points) Discuss the issues you would want to consider in evaluating the debt capacity of the Zizanic film.
- 2) (10 points) Using these data, estimate the WACC Rock should use in evaluating this project. Explicitly state your reasoning behind your assumptions concerning the expected market return.
- 3) (10 points) What discount rate or rates should Rock choose for his APV calculations?
- 4) Cash flows
  - a) (25 points) Estimate the relevant free cash flows for Rock's decision. Assume that the expected annual inflation rate is 0%.
  - b) (5 points) If the tax authorities give Asteroid Pictures a choice in calculating annual depreciation, would they rather depreciate straight-line to zero or depreciate to a salvage value of \$1,000,000, why?. {Explain, no calculations necessary}
- 5) (15 points) Valuation of cash flows: Do you think Rock should go forward with this movie? Calculate the NPV and the APV of the movie. What comparables could rock look at?
- 6) (20 points) Rock had to take a walk to relieve the stress. When Rock returned to his office, there was a message that the writers of the movie had just called and said that they have a sequel to Zizanic already written, called "Zizanic2." If Asteroid buys the original Zizanic script, the writers will give Asteroid the right to buy the sequel for \$2 million anytime within the next 3 years. If Asteroid does not buy Zizanic, they will not be able to purchase the script for Zizanic2. The value of this script will be largely determined by the success of the Zizanic along with a number of other factors (e.g., changes in the economy, consumers' tastes, etc.). Well placed sources inform Rock that an offer of \$1.95 million is outstanding on the script for Zizanic2. However the value of the script is likely to vary wildly over the next few years.
  - a) Provide an analysis of the factors that Rock should consider in evaluating the sequel and how to analyze these factors.
  - b) Make a well reasoned guess concerning the value of the right to buy the Zizanic2 script?
  - c) How should the analysis of Zizanic2 be incorporated into Rock's decision?
- 7) (15 points) DO NOT LET THE INFORMATION IN THIS QUESTION INFLUENCE YOUR ANSWERS TO QUESTIONS ONE THROUGH SIX. Rock's stress level is rising fast. He just got off the phone with Mom & Dad and they are selling all their other investments and buying out the other shareholders in Asteroid Pictures Inc. Now Rock's decisions will affect Mom & Dad's retirement lifestyle. One mistake and Mom and Dad will move in with Rock. He frantically calls an M&A advisor who seems to be quite confident that they can sell Asteroid for a substantial premium to its current market value. Explain why this may be? {No calculations necessary.}

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Professor John Chalmers  
E52-403a, 253-2933  
jchalmer@mit.edu

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Answer Question 1:

Answer Question 2:



Question 3 continued

Question 4

Question 5:

Question 6:

Question 7: