SIMON FRASER UNIVERSITY
Faculty of Business Administration

FINAL EXAM

BUS 417 Security Analysis 17-2
Prof. Geoffrey Poitras

EXAM INSTRUCTIONS: Please record all answers in the examination book provided. Calculators with enhanced capabilities such as the ability to input executable programs or attach external drives, whether such drives are attached or not, are prohibited. Use of devices with communications abilities, such as cell phones, is prohibited. The **2 hour** exam is closed book, no books or other supplementary materials are permitted to be used during the examination.

EXAM DURATION: TWO HOURS

DO ALL PARTS OF ALL QUESTIONS: Each question is worth 25 total points – for questions with two parts 10 points for part i) and 15 points for part ii)

1. The relative value or 'Wall Street' approach to security analysis ignores the importance of calculating an *intrinsic value* and comparing this value to the observed market price to identify if the security is eligible for purchase. Instead, relative value security selection aims to determine the 'best' stock to purchase in a given sector, without evaluating whether securities in the sector are fairly priced. Using this approach, identify the 'best' security in the five different sectors that were examined during the in-class presentations. (Hint: Be sure to explain the relative value rationale for each of the five stocks selected.)

2.i) Describe the evolution of security analysis from 1900 to the present. In your answer be sure to identify seminal contributions to the different approaches to the subject and to provide an overview of the essential elements of these possible approaches.

ii) "The search for the 'correct' way to value common stocks, or even one that works, has occupied a huge amount of effort over a long period of time....the implementation of a system to selectively value or select common stocks is a difficult task. This is a task that a valuation model purports to accomplish."
Describe the **discounted dividend** cash flow valuation models conventionally used to analyse common stocks. How do these models differ from valuation models that discount cash flows other than dividends? What are some important limitations of using accounting data to implement discounted cash flow valuation?

3. CHOICE QUESTION: DO EITHER A) or B)

3A) Warren Buffett has observed:

> "Academics ... like to define investment 'risk' differently, averring that it is the relative volatility of a stock or portfolio of stocks – that is, their volatility as compared to a large

universe of stocks. Employing data bases and statistical skills, these academics compute with precision the 'beta' of a stock its relative volatility in the past – and then build arcane investment and capital-allocation theories around this calculation. In their hunger for a single statistic to measure risk, however, they forget a fundamental principle: It is better to be approximately right than precisely wrong."

Comment on the implications of this statement for the analysis and valuation of equity securities. In your answer be sure to provide an assessment of the validity of the statement as well as a discussion of how investment strategy would have to be formulated if the statement were correct.

3B) Do both parts i) and ii). Show relevant calculations and derivations.
i) -- Derive the Macaulay duration formula for a par bond.
-- With money to invest for 10 years, you are trying to determine whether to buy and hold a 10 year par bond with yield of 2.22% or to purchase a **duration equal** portfolio of 2 year par bond with yield of 1.32% and a 30 year par bond with yield of 2.81%. Calculate: the duration equal weights for the barbell portfolio; and, the 'cost of convexity' (difference in the thetas).

ii)-- Using a 'discrete' derivative and an interest rate of 2.5%, solve for the Macaulay duration of a life annuity for a 65 year old person that cannot live beyond 95 years.
-- Assuming a maximum possible life of 90 years, what is the approximate implied interest rate for a 'life income' of $100,000/yr. priced at $1.5 million for a person retiring at age 60?
– Define the following: i) spot interest rate (implied zero coupon interest rate); ii) implied forward rate; iii) self-calibrating interest rate process

4.i) Discuss the early history of life contingency valuation, from Roman times to the 16th century. Be sure to discuss: the role of life contingencies in municipal and state finance; and, the role of religion in determining the method of security contracting.

ii) Contrast the solutions to the life annuity valuation problem developed by Jan de Witt, Edmund Halley and Abraham de Moivre. Be sure to: identify relevant assumptions used to obtain the solutions; explain the connection of each life annuity pricing formula to pricing using discounted expected value; and, identify the limitations for each of the solutions.

BONUS: (5 points)

You are in the market for a house. Your effective all-in market borrowing rate for a second mortgage with a five year term from a bank is 4.79%. The vendor of one of the houses you are considering purchasing is willing to undertake a $600,000 second mortgage, with a 5 year term at 3.75%, and a 25 year amortization period. The asking price on the house is $900,000. What adjustment to the sales price of the house is warranted if, as part of the purchase, you take up the vendor's second mortgage offer?