Finance 4335 (Spring 2021) Midterm 2 synopsis

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I. Insurance economics focuses upon some examples of how risk aversion influences incentives for risk transfer to a counterparty (in this case, an insurer). The three major concepts include the so-called Bernoulli principle, Mossin's theorem, and Arrow's Theorem.

A. Bernoulli principle – if insurance is actuarially fair, risk averters fully insure.

B. Mossin's theorem – if insurance is actuarially unfair, risk averters partially insure.

C. Arrow's theorem – other things equal, the optimal partial insurance contract is the deductible contract.

II. Asymmetric information, moral hazard, and adverse selection

A. Asymmetric Information occurs when one party to a transaction has an informational advantage over the other party.

B. The two types of problems that arise when there is asymmetric information include (1) moral hazard, which is a problem of *hidden action* that occurs *after* a counter-party relationship has been formed (e.g., between a firm and its manager), and (2) adverse selection, which is a problem of *hidden information* that occurs *prior* to the formation of a counter-party relationship (e.g., between a prospective buyer and seller).

III. Portfolio Theory

A. Mean-variance efficient set of portfolios lie along the northwest perimeter of the feasible set of portfolios, where σ_p is the X axis variable and $E(r_p)$ is the Y axis variable.

B. Optimal exposure to risk is positively related to the Sharpe Ratio and risk tolerance; inversely related to market volatility.

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IV. Capital Market Theory

A. From the portfolio theory, it follows that expected utility maximizing investors will (depending on their level of risk tolerance) either lend or borrow at the riskless rate of interest r_f against the (tangent) market portfolio M.

B. Thus, the mean-variance efficient set of portfolios in a world with riskless lending and borrowing is the locus of points that lie along the *Capital Market Line*, the equation for which is $E(r_p) = r_f + \dfrac{E(r_M) - r_f}{\sigma_M}\sigma_p$.

C. The *Security Market Line*, also known as the Capital Asset Pricing Model or CAPM, follows as a logical consequence of the Capital Market Line. It's equation is $E(r_i) = r_f + \beta_i[E(r_M) - r_f]$, where $\beta_i = \sigma_{iM}/\sigma_M^2$ indicates (on a relative scale) how risky asset i is compared with M.

D. Thus, the expected return on risky asset i is equal to the expected return on a riskless asset r_f, plus a risk premium that is proportional to the excess expected net return of the market over and above the expected return on a riskless asset; i.e., $E(r_m) - r_f$; the proportionality factor is β_i. The CAPM implies that only "systematic" (i.e., covariance) risk is priced. "Unsystematic" (idiosyncratic, or unique) risk is inconsequential since investors diversify unsystematic risk away by holding combinations of the riskless asset and the market portfolio.

E. The notion that only systematic risk matters is belied by the fact that corporations devote enormous amounts of resources toward managing idiosyncratic risks; e.g., commercial property-liability insurance premiums paid by U.S. companies in 2017 came to $235.2 billion.[1] Putting this number into perspective, the Federal Reserve Bank of St. Louis reports that in that same year, total dividends paid by U.S. non-financial corporations came to $792.5 billion.[2] Thus, it appears that management of unique firm-specific risks is important after all. The question is why, which is a question that we will take up in the third and final part of Finance 4335.

[1] See Chapter 7, page 71 of the 2019 Insurance Fact Book.
[2] See "Dividends paid: Domestic corporate business: Nonfinancial".