

國立台灣科技大學九十八學年度碩士班招生試題

系所組別：財務金融研究所碩士班

科目：財務管理

(總分爲 100 分)

1. The following excerpt is from an article, titled "Fixing Finance" in *the Economist* on January 24, 2009:

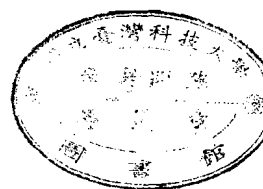
In America, for instance, the insurance industry is regulated by the states; AIG's capital-markets group, which lost all that money insuring CDOs for foreign banks, fell between stools. Similarly, futures come under one regulator, jealously guarded by its own congressional committees, and stocks under another. The status quo suits many interests, but the plan to reorganise America's regulators put forward by Hank Paulson, the recently departed treasury secretary, deserves a good hearing.

Everywhere, countries need to look at their mortgage markets. As housing recovers, they should phase out tax relief on mortgage payments. America should give mortgage lenders a claim on more than just the borrower's house, so as to deter speculative buying. At the same time, mortgage origination should be tightened up: too often lenders connived with borrowers to swell the size of mortgages, or worse, sell borrowers the wrong policy. Stopping housing from being a subsidised asset may not prevent booms or mis-selling—after all, unsubsidised Britain saw one of the bigger booms—but it should moderate them.

The presumption should be for transparency. That favours market-based accounting (which, for all its faults, is better than sweeping losses under the carpet). Securities such as credit-default swaps which trade in huge volumes should pass through clearing houses. That would have the added benefit of limiting the damage from a collapse, since the default would pass to the clearing house too. The system can be made more robust in other ways. Rather than regulate institution by institution, as at present, the authorities need to watch the overall level of credit creation and leverage. In this spirit, regulators can push against a boom by asking banks to hold more capital (though the markets will be pushing in the other direction). Senior financiers could take more of their pay in equity—and hand some back if the bank does badly.

Please comment on how to "fix finance" based on the excerpt above.
(25 points)

2. If you were a venture capitalist (VC) and had a genie in a bottle that you could ask one question of with respect to every business plan that came over the window or every team that walked in the door, what would it be? and why?
(25 points)



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3. (20%) Assume that there are only two stocks: Stock A and Stock B. The expected returns of Stock A and Stock B are 18% and 12%, respectively. The variances of their returns are 6% and 8%, respectively. The covariance between the two is 4%. Assume that the risk-free rate is 5%. Compute the tangency and minimum variance portfolios.

4. (10%) Assume a two-factor model for next year's profits of Japan Sun Oil Company, Ltd. (SUNOCO). The factors are one-year futures prices for oil and one-year futures prices for the US\$/¥ exchange rate. The relevant factor equation is as follows:

$$\text{Profit}_{\text{SUNOCO}} = \$1.2 \text{ billion} + \$12 \text{ million } F_{\text{OIL}} + \$18 \text{ million } F_{\$/¥} + \epsilon_{\text{SUNOCO}}$$

Assume that each one-year oil futures contract purchased has the factor equation as follows:

$$C_{\text{OIL}} = \$15,000 F_{\text{OIL}}$$

Each one-year futures contract on the US\$/¥ exchange rate has the factor equation as follows:

$$C_{\$/¥} = \$150,000 F_{\$/¥}$$

If SUNOCO wants to reduce its exposure to the two risk factors in half, how can it accomplish this by buying or selling futures contracts?

5. (20%) A 2-year default-free straight-coupon bond has annual coupons of \$10 per \$100 of face value. Assume that a default-free zero-coupon bond with one year to maturity sells for \$90 per \$100 of face value and that a default-free zero-coupon bond with two years to maturity sells for \$78 per \$100 of face value. (a) What is the no-arbitrage price of the straight-coupon 10 percent bond? (b) Assume you hold \$1 million face value of the straight-coupon bond. How much in market value of a 3-year, zero-coupon bond should you hold (in addition to the straight-coupon bond position) to have an overall position that is perfectly hedged against a parallel shift in the term structure?

