

Midterm Exam 2: Answer Sheet

1. (8 points each) True, False, Uncertain, and Explain. Explain whether the statement is true, false, or uncertain.

- (a) "High price-earnings ratios do not forecast future dividend growth, rather they only forecast low returns."

brief answer *True. While it used to be thought that high $\frac{P}{D}$ was the result of higher expected dividend growth, evidence suggests rather that this is associated with low discount rates, and that price-earnings ratios revert to the mean. Hence, future returns are likely to be low. High prices, relative to dividends, have reliably preceded many years of poor returns. Low prices have preceded high returns. This seems true not just for stocks but also for housing prices relative to rents.*

- (b) "Assets that are highly sensitive to information are naturally the best candidate for use in repo transactions."

brief answer *False. Informationally-insensitive assets are better since the lender in the repo transaction does not need to invest resources in analyzing the quality of the collateral. If assets are informationally sensitive then the haircut that will be demanded will depend on the asset. Raises the cost of the transaction.*

- (c) "The growth in shadow banking was, in part, the result of deregulation of the banking system."

brief answer *True. Deregulation increased competition for banks. On the asset side banks lost many conventional customers, especially to junk bonds and commercial paper. On the liability side banks lost cheap sources of funding, for example to money market mutual funds. Banks lost market share and funding. Securitization was a response. It allowed more loans to be made with the same capital. And with the decline in charter value of banks on-balance sheet lending became more subject to moral hazard.*

- (d) "The Modigliani-Miller theorem suggests that there is no benefit from securitization. It thus follows that there is no economic benefit from securitization."

brief answer *False. It implies that some conditions of the theorem are not satisfied. For example, regulatory arbitrage leads to securitization if bank capital standards are higher than market capital demands. And securitization reduces bankruptcy risks. Moreover, with imperfect information about loan quality, securitization can be beneficial if tranching is effective.*

- (e) "The best way for a lender to deal with a subprime borrower is to charge a high enough interest rate to cover the default risk."

brief answer *False. Raising interest rates could lead to adverse selection. Better borrowers (those who would like to repay the loan) may be deterred, but bad borrowers will not. So higher interest rates can worsen the borrower pool.*

2. (20 points) "Structured finance has enabled investors to write insurance against large declines in the aggregate economy. Investors in senior tranches of collateralized debt obligations bear enormous systematic risk..." Explain the logic of this statement.

brief answer *Super senior tranches are effectively protected against idiosyncratic risk by tranching and pooling. For super senior tranches to be at risk requires a huge number of defaults. This happens only if some aggregate shock causes all loans to default. This occurs when there is a systemic shock.*

- (a) How does the process of pooling and tranching reduce default risk of senior tranches of mortgage backed securities? Explain.

brief answer *Pooling allows for diversification, tranching shifts the risk to the more junior securities. If default risks are uncorrelated the risk of senior tranches is much less than the underlying assets since the senior tranche only defaults if many loans default simultaneously, and unlikely event. For example, a security with two loans that each default with probability .1, the senior tranche defaults only if both loans default which occurs with probability .01.*

- (b) How can it be that the investors in the most senior tranches of securitizations, with necessarily very high credit ratings, are bearing enormous systematic risk? Explain.

brief answer *As noted above the senior tranches default only if there are widespread defaults, this occurs if there is some aggregate shock that causes defaults to be highly correlated.*

- (c) Ignoring issues of conflicts of interest, why might the procedures used by credit rating agencies have missed some of the risks associated with securitization? Give examples.

brief answer *The models that were used had limited historical data taken from periods when housing prices were rising. Hence, it appeared that defaults were rare and uncorrelated. They also underestimated the sensitivity of default rates to housing prices for the same reason. And they underestimated what would happen to default correlation in stressful times. They also ignored originator risk, that results from many mortgages being originated from a small number of firms; hence, if they had problematic procedures, the loans would have common problems, even if they were geographically dispersed. All these factors played a role.*

3. (18 points) Describe the process of creating a mortgage backed security from the origination to the sale of securities. What are the critical steps in the process? You may use a diagram to illustrate the steps in the process. Try to explain the importance of the steps.

brief answer *Originator makes loans and sells them to the bank or other institution. They are pooled together, often in a SPV. Then the pool is tranching into levels with different levels of exposure to defaults. The tranches are rated and then sold. The key important parts are pooling, which introduced diversification, and tranching, which allocates the risk so that securities with different ratings can be established.*

- (a) Describe the process of going from a mortgage backed security to a CDO. What is a CDO²? Explain.

brief answer *A CDO² is a security where the underlying assets are tranches of CDOs. For example, a pool of BBB-rated tranches of a CDO are collected and put into a SPV which is then tranced. The CDO² creates highly rated securities out of a pool of rather lower rated securities.*

- (b) What, if anything, is distinctive about a CDO² (from the point of view of thinking about the financial crisis)?

brief answer *The most distinctive point is that the tranches of the CDO² are very sensitive to small changes in the underlying default levels of the original securities. So when default rates on mortgages started to rise the riskiness of CDO²s was greatly impacted. The percentage increase in default risk of a tranche of a CDO² can be orders of magnitude higher than for a CDO when the underlying default risk rises.*

4. (22 points) What is performance-based arbitrage (PBA)? Why would it be used? What is an alternative?

brief answer *PBA describes the situation when the funds available to arbitrageurs depends on past performance. It may be used because it is hard to judge who the better arbitrageurs are, if there is limited information about arbitrageur strategies, investors use past performance to allocate their funds. An alternative could be investing based on knowledge of the behavior of the arbitrageur but that it hard to implement. Or random investment across arbitrageurs.*

- (a) Why might PBA be important for understanding when arbitrage is not effective? Explain.

brief answer *PBA makes arbitrageurs sensitive to market movements. If prices move against arbitrageurs due to noise trader behavior they may fear that investors will withdraw funds before markets correct themselves. This fear may cause them to exit the market at the most opportune time. If arbitrageurs have unlimited funds then they will not worry about this, and hence when they know price is less than warranted by fundamentals they will buy. But if they are worried about withdrawals they may not.*

- (b) Why can't arbitrageurs eliminate the negative impact of PBA? Explain.

brief answer *If arbitrageurs publish their trading strategies they lose their competitive edge. But if they don't do that they cannot document why they are correct even if their short-term performance is poor. It could be possible to set up longer-term contracts, but investors may be very reluctant to do that for rather obvious reasons.*

- (c) If PBA is strong why might arbitrageurs be reluctant to offset the impact of noise traders? Explain.

brief answer *If funds are very sensitive to current performance then arbitrageurs will not commit all of their funds when they observe market prices that differ from fundamentals. They save some funds to meet future withdrawals. The reason is that*

they fear future withdrawals if the market correction takes too much time. But if they do not commit their funds then the demand for assets will be dominated by the noise traders. As in question 3 of the last problem set we found that $p_1 = V - S_1 + D_1$. If PBA is strong then $D_1 < F_1$. So the impact of S_1 is larger than would be the case if $D_1 = F_1$. We can think of the strength of PBA determining by how much D_1 is less than F_1 .

- (d) What would happen if the investors who finance hedge funds knew the trading strategies of arbitragers? Would market efficiency be enhanced or weakened? Explain. Is this a good assumption? Explain.

brief answer *If the strategies were sensible then it would enhance efficiency. This would lessen the need for PBA. Investors who knew that arbitragers were buying an asset because $p_1 < V$ would be confident that they would eventually make money even if short-term losses appeared. It is hard to believe this could happen however. How could they reveal their strategies and make money? The investors would then just trade themselves without needing the arbitragers. We would have the Grossman-Stiglitz paradox. If it is so easy to copycat then there would be no incentive to invest in developing a strategy. So perhaps nobody would do it.*