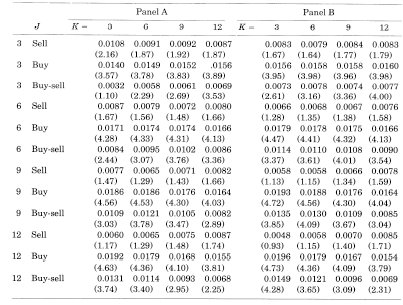
**Lab 6: final practice. Due 12-12-18. We will go over this during the final exam review. Counts as a lab when you turn it in.**

1. (20) You are investigating mergers in the pharmaceutical industry (and only that industry). One thing you have learned is that recently, to fill their excess capacity, rather than doing research and development for new drugs in-house, drug companies have been purchasing smaller pharmaceutical companies with profitable ideas and utilizing their excess capacity to produce those drugs. You want to know if this is a smart idea. To investigate, you look at the stock price reaction of the large acquiring drug firm. To simplify the problem, assume that all acquiring firms are the same (large) size and all targets are the same (small) size.
   1. (10 points) Suppose you find that the acquiring firm has a positive stock price reaction but this reaction is smaller when the acquiring drug company has more excess capacity. How do you interpret this reaction?
   2. (10 points) Suppose the stock price reaction is zero for the acquiring firms. Is it possible that the acquisition still creates synergies?
2. Multiple choice or True/False
   1. True or false: If one regresses the market index return on the past market index return and the alpha of that regression is significantly different from zero, then weak-form market efficiency can be rejected.
   2. True or false: If one regresses the market index return on the past market index return and the beta of that regression is significantly different from zero, then weak-form market efficiency can be rejected.
   3. True or false: Information leakage before an earnings announcement is necessarily evidence of strong-form market inefficiency.
   4. True or False: If markets are efficient, asset prices must follow a random walk (potentially with constant drift).
   5. True or False: If markets are efficient, return volatility can be predictable.
3. (30) Consider the following table from Jegadeesh and Titman’s (1993) paper on momentum:



The values in the top line are the raw monthly returns either for a buy portfolio, a sell portfolio, or an arbitrage (buy-sell) portfolio and immediately below in parentheses are the t-values associated with the returns. The numbers on the Y axis represent the duration of the portfolio formation period and the numbers on the vertical axis represent the duration of the holding period. The difference between panels A and B is that the returns in panel B are computed for strategies that skip a week between portfolio formation period and portfolio holding period.

* 1. (10) Notice that the returns on the buy portfolio are statistically significantly positive for each of the 32 strategies. Does mean that the stocks in the buy portfolio are a good buy? What evidence might convince you to buy these securities?
  2. (10) The returns on the buy-sell portfolios are also statistically significantly positive. Is that enough evidence for an investor to confidently follow a momentum strategy?
  3. (10) Suppose you were trying to determine whether or not the risk-adjusted returns on the buy-sell portfolio were statistically significantly positive. How would you set up such a test? Specifically, how would you do the risk adjustment?

1. Short Answer.
   1. Suppose the Fama French model is true instead of the CAPM but you continue to draw the security market line. What would cause a particular stock to lie above the security market line and what would cause it to lie below the security market line?
2. Suppose the risk free rate is zero and you run the following regression for a time series of returns on stock i: You find that the regression coefficients is positive and significant and is insignificant.
   1. Is the market likely to be efficient or inefficient? Explain. Is there a trading strategy one could use to take advantage of potential inefficiency here?
   2. Give an interpretation for and
   3. Now suppose that both and are positive and statistically significant. Is the market still likely to be efficient? Interpret what a positive beta coefficient means.Is there a trading strategy that could be used to take advantage of potential inefficiency here?
   4. Now suppose the risk free rate is still zero you ran a different regression: You find that the regression coefficients is positive and significant and is insignificant. Is the market likely to be efficient or inefficient? Explain.
   5. Now finally the risk free rate is still zero you ran a different regression: You find that the regression coefficients is positive and significant and is insignificant. Is the market likely to be efficient or inefficient? Explain.
3. It is currently November. You are Vice President in charge of advertising for a medium-sized American beverage company and you are trying to decide whether to buy ads during the NCAA basketball tournament to air during the games on the final weekend the following April. You must purchase the advertising time at least two months before the event. You have never advertised at the NCAAs before. You assemble a team which consists of experts in both finance and marketing to investigate.

The finance expert looks at academic studies which assess the stock market performance of companies that advertise during the Super Bowl. She explains that many different types of firms advertise at the Super Bowl and they are all included in the study. Some are very large, and some are small. Some have advertised many times before, and some are advertising for the first time. The ad announcements are published in the marketing press when the ad is purchased.

The expert explains that there is no positive average abnormal return on the Monday after the broadcast for the entire sample of firms that advertise during the Super Bowl. This is true whether the ads have been shown prior to the Super Bowl or not. There is also no abnormal positive drift after the announcement. Therefore, she thinks it is probably not a good idea to advertise during the NCAA tournament because the situations are so similar (although advertising during the NCAA final is less costly than advertising during the Super Bowl).

* 1. For which firms in the Super Bowl study would you expect the announcement to advertise to be new information and why?
  2. Should all firms for which the announcement to advertise is new information expect statistically significant positive abnormal returns? If not, why not?
  3. If there were to be an abnormal return at all for any firm in the Super Bowl study, when would you expect it to occur, on the day of (or the day after) the Super Bowl or at some other time? Explain. If you answered (at come other time), when would that be and why? Hint: when would market efficiency imply that any positive abnormal return should occur?
  4. Do you think that the situations (Super Bowl vs. NCAA advertising) are similar other than the fact that the viewing audience at the NCAAs is smaller than at the Super Bowl? Why or why not?
  5. Can you conclude anything from the failure of the aforementioned Super Bowl study to find abnormal returns on average after the Super Bowl about the possibility of superior market performance if you undertake the advertising campaign? Why or why not?

1. Explain the procedure used by Fama and French to reject the CAPM. What regressions did they run and what (qualitatively) was the evidence used to reject the model?
2. Suppose you conducted an event study to measure the informational impact of the 2016 US elections. Further suppose that outcomes for the US would be very different depending on the party that would be in power after the election. Yet, you found that statistically speaking, there was no effect on asset markets on the day of or the day after the election. Would you conclude that markets were *necessarily* inefficient in their ability to aggregate information? Why or why not?
3. (30) Suppose that the CAPM is true and a publicly traded firm’s expected return on investment is less than its cost of capital. Accountants try to get at this concept using return on invested capital, but for the purposes of this problem, you can compute return on investment without accounting distortions. You can also compute the risk and expected return characteristics of the firm’s projects exactly.
   1. (5) Should the firm’s expected equity return and beta pair plot on the security market line?
   2. (5) Should the firm project return, beta pairs also lie on the security market line? If not, where should they lie on average?
   3. (5) Should the firm’s expected return and risk pairs lie on the capital market line? If not, where should they lie?
   4. (5) Should the firm’s project’s expected return-risk pairs lie on the capital market line? If not, where should they lie?
   5. (5) Suppose KKR takes this firm private in a leveraged buy-out. Assume that the risk-free rate is zero. The day of the LBO, market returns are also zero and the returns on KKR are zero. What can you say about market expectations regarding the size of the synergy created by the LBO?
   6. (5) How would you test whether the abnormal returns for the three years following the LBO were statistically significantly different from zero? Write down the test statistic you would use and explain why you chose the one you did. (There are multiple right answers). Depending on the test you chose, provide one major shortcoming of the approach you ended up using.
4. (30) Global equity markets experienced a significantly negative return of over 4.7 percent on June 24, 2016 in response to news of Britain’s decision (BREXIT) to leave the European Union. Many feared that the exit would result in deteriorating terms of trade between the remaining EU countries and Britain.

We collected daily data on 64 stock exchanges from Bloomberg for the period January 6, 2016 through June 30, 2016. Our sample includes the following stock exchanges: Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, China, Chile, Colombia, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Italy, Ireland, Japan, Kazakhstan, Latvia, Luxembourg, Macedonia, Malaysia, Malta, Mexico, Netherlands, Nigeria, Norway, Pakistan, Philippines, Poland, Portugal, Qatar, Romania, Russia, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Switzerland, Taiwan, Thailand, Turkey, UAE, Ukraine, United Kingdom, United States, and Vietnam. For a measure of global market returns, we drew data from the Global Financial Database on three indices: the MSCI global price index, the S&P Global Equity Index, and the Dow Jones Global Equity Index – with each of the alternative indices yielding almost identical empirical results. We ran the following regression:

To measure abnormal returns for the various country indices, , we ran the following market model regressions for our sample period:

where is the individual market return, is the global market return, and and are dummy variables equal to one on June 24 , June 27, and June 28, 2016, respectively. Accordingly, the coefficients measure abnormal returns for index on datesJune 24, June 27t and June 28.

Overall market moves were -4.7% on the 24th and -2.2% on June 27th for a cumulative return on the market index on those two dates of nearly -7%. Consider the following table which provides *abnormal* returns relative to the market during the sample period for a number of countries in Europe Bold means statistical significance at the 5% level.

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| **Table 3: Country Abnormal Returns in percentage points relative to the MSCI Global Index where returns are measured in US dollars** | | | |  |  |  |
|  | **Constant** | **Market Beta** | **6/24/2016** | **6/27/2016** | **6/28/2016** | **R-Squared** |
| *Europe* |  |  |  |  |  |  |
| Czech Republic | 0.0004 | **0.814** | **-2.51%** | **-2.93%** | **1.14%** | 0.527 |
| France | 0 | **1.291** | **-4.07%** | **-0.95%** | **0.78%** | 0.776 |
| Germany | -0.0001 | **1.209** | **-3.26%** | **-1.17%** | 0.02% | 0.721 |
| Greece | -0.0001 | **1.108** | **-10.12%** | -0.91% | **2.34%** | 0.444 |
| Hungary | 0.001 | **0.921** | **-3.45%** | **-0.66%** | **2.54%** | 0.55 |
| Iceland | 0.0004 | **0.419** | **-3.98%** | **-2.06%** | **1.66%** | 0.369 |
| Italy | -0.001 | **1.637** | **-6.65%** | **-1.05%** | **0.99%** | 0.685 |
| Ireland | -0.002 | **0.997** | **-5.15%** | **-8.45%** | **1.53%** | 0.725 |
| Poland | -0.0002 | 1.02 | **-3.77%** | -0.34% | **0.89%** | 0.544 |
| Portugal | -0.0008 | **1.147** | **-3.66%** | -0.56% | **0.80%** | 0.616 |
| Russia | 0.00002 | **1.795** | **5.30%** | 0.82% | -0.22% | 0.498 |
| Spain | -0.0004 | **1.457** | **-7.46%** | **0.73%** | **0.58%** | 0.785 |
| UK | 0.0015 | **1.415** | **-4.22%** | **2.74%** | **1.14%** | 0.822 |
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* 1. (8) What was the expected return cumulative abnormal return on British stock over the two-trading-day period 6-24 to 6-27? Approximately what was the expected cumulative return?
  2. (8) Britain’s largest trading partners on this list are Germany and France. Other countries are less connected in terms of trade. How did Germany and France fare compared with Britain in terms of abnormal returns over the same 2-day period examined in part a? Although you do not have standard errors in this table, you can get some idea whether the expected damage done by Brexit is about the same in Britain as in the large countries in the EU. Given the relative effects in the two countries, did market participants set stock prices in a way consistent with trade fears?
  3. (8) Clearly, there were come country indexes that did worse than Britain by far. Consider Greece. In the Greek bailout, where the EU made sure that Greece did not default on its sovereign debt. Other countries which have been in the news recently because of the riskiness of their sovereign debt are Italy, Ireland, Portugal and Spain. How did these countries fare over the same two-day window in terms of cumulative returns? What do you think these data imply about the change in the likelihood of a sovereign default in these countries and the willingness of the EU to prevent such a crisis?
  4. (6) Now look at Russia’s returns (cumulative returns and cumulative abnormal returns. Can you explain the pattern of Russia’s returns over the two-day window relative to the returns in the EU countries?

1. (10) (**short** answer) Explain what is meant by the Fama-MacBeth two-pass technique for testing the CAPM.
   1. (4) What regression is run in the first pass?
   2. (4) What regression is run in the second pass?
   3. (3) In the two-pass technique, what evidence did Fama and French (1992) use to reject the CAPM?

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| --- | --- | --- | --- | --- |
| OUTPUT |  |  |  |  |
| Exxon |  |  |  |  |
| *Regression Statistics* | |  |  |  |
| Multiple R | 0.551273314 |  |  |  |
| R Square | 0.303902267 |  |  |  |
| Adjusted R Square | 0.273192072 |  |  |  |
| Standard Error | 0.048917177 |  |  |  |
| Observations | 72 |  |  |  |
|  |  |  |  |  |
| ANOVA |  |  |  |  |
|  | *df* | *SS* | *MS* | *F* |
| Regression | 3 | 0.071038765 | 0.02368 | 9.895811 |
| Residual | 68 | 0.162716533 | 0.002393 |  |
| Total | 71 | 0.233755298 |  |  |
|  |  |  |  |  |
|  | *Coefficients* | *Standard Error* | *t Stat* | *P-value* |
| Intercept | -0.001637692 | 0.006075652 | -0.26955 | 0.788323 |
| RM-RF | 0.674135712 | 0.183870884 | 3.666354 | 0.000484 |
| SMB | -0.388962337 | 0.288115566 | -1.35002 | 0.181486 |
| HML | 1.039278299 | 0.274113121 | 3.791421 | 0.000321 |

1. (30) Consider the following table immediately above. The data are the results of the following regression: . The risk-free rate in the regression and in the Fama French data in general is a very short-term t-bill return. The time period is 72 monthly observations 2-1-2011 to 1-3-2017. The data are scaled so that a return of 1% is entered as 0.01.
   1. (5) How much risk is idiosyncratic, and how much risk is systematic?
   2. (5) Is Exxon a value stock or a growth stock or neither? How do you know?
   3. (20) Suppose you want to compute a cost of equity capital for Exxon and you want to use the Fama French 3-factor model. For your data, you have that the monthly average returns on and are .61%, .08% and -.13% respectively. You also know that the current t-bill return is 0.03% per month and the current t-bond return is 0.2% per month. You also know that the long-term (90 year) monthly averages in the Fama French data for are 0.64%, 0.21%, 0.39% and 0.27% respectively.

What would you use to compute the cost of equity capital for Exxon? Explain how you computed that number and why you made the choices you did.