MF 803 HW 2
Sketch of Solutions

September 29, 2018

Claim: in the solutions I won't give you detailed answers for all the questions. Instead, I'm trying to provide intuitions or algorithms for the most crucial and confusing parts.

1

(b) You should expect a less correlated result. (Question: if they're highly correlated, can we do the regression in 3-factor Fama-French model?)

(c) Correlations are more stable with S&P Index than with each other.

(f) The residuals are not very normaly distributed, so the model may not apply to the daily returns. If you have time, try to regress on the monthly data (not montharized data), you should expect a better result. The easit ways to test are drawing histagram to fit a density plot or drawing a QQ plot. You can also apply a more rigorous statistical test.

2

(c) You should expect a significant lower option price in Bachelier model. Because in this case the volatilty part of stock price is constant and is not amplified by S_t. Remember the intuition I gave you in HW1 that more volatility gives you more choices so you should pay a higher premium.

(d) Notice that delta at should be close to -1. The reason is that the volatility of stock price is very limited in Bachelier model so the minimum stock price during the period is highly correlated with the initial stock price. Generally you might have extreme numbers around very small ϵ because $c_0(.)$ is not a smooth function.