Tentin päivämäärä / Date of exam: **September 12, 2013**	
Opintojakson koodi, nimi ja tentin numero / The code and the name of the course and number of the exam: **721383S, Asset Pricing 2/3**	
Tentaattori(t)/ Examiner(s): **Hannu Kahra**	
Sallitut apuvälineet / The devices allowed in the exam: ☐X Laskin (ei graafinen/ohjelmoitava)/Calculator (not graphic, programmable) ☐X Sanakirja/Dictionary ☐X Muu materiaali, tarkennettu alla/Other material, specified below **Kaikki kirjallinen materiaali (kirja/kirjoja, artikkeleita, luentomateriaalia, jne.)**	
Tenttiin vastaaminen / Please answer the questions ☐X suomeksi/ in Finnish	☐X englanniksi/ in English
Kysymyspaperi on palautettava / Paper with exam questions must be returned: ☐ Kyllä/Yes	☐X Ei/No

Keep in the facts and try to avoid story-telling. Optimize your time. Short answers.

1. How do Fama and French define "value" and "small" stocks? (6 points)
2. How are the Fama-French "SMB" and "HML" factors constructed? (6 points)
3. What is the *economical* explanation of the Fama-French factors? (6 points)
4. Consider the following equation $R^e_{t\to t+k} = a + b \times D_t / P_t + \varepsilon_{t+k}$, where the dependent variable is the return on a value weighted portfolio (index) less the 3-month risk-free rate and the independent variable is the dividend yield of the portfolio. The resulting estimates and the associated statistics are displayed in the following table.

Horizon *k*	*b*	*t(b)*	R^2
1 year	3.8	2.6	0.09
5 years	20.6	3.4	0.28

   a) What is the statistical significance of the model, using your own words? (2 points)
   b) What is the economic significance of the model, using your own words? (2 points)
   c) What is the central fact of the equation, using your own words? (2 points)

5. What is the cause of predictability in problem (4)? Are there other variables that forecast stock returns? Is predictability in conflict with the Efficient Market Hypothesis? (6 points)
6. Cochrane says that asset returns and covariances are functions of asset characteristics. What does he mean by that? Provide a few examples? (6 points)
7. The following formula provides the standard portfolio advice when allocating funds into risky assets (e.g. stocks).

$$\text{Equity share} = \frac{1}{\gamma}\frac{E(R^e)}{\sigma^2(R^e)},$$

where γ is the risk aversion parameter, $E(R^e)$ is the expected excess return and $\sigma^2(R^e)$ is the variance of the excess return. You have risk aversion $\gamma = 1$ and returns are independent of time. Your best guess is that the mean annual premium $\mu = E(R^e)$ is 4% with volatility $\sigma = 20\%$.

a) What should your allocation to stocks be? (4 points)

b) In fact you don't really know what the mean return is. Reflecting on it, your uncertainty about the mean return $\sigma(\mu)$ is 10 percentage points, and both the actual return and your uncertainty about it are normally distributed. How does this consideration change your optimal allocation to stocks? (6 points)

8. ICAPM vs. APT. (6 points)