

Opiskelijan nimi / Student name:	Opiskelijanumero / Student number:
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<b>Opintojakson koodi and nimi / The code and the name of the course:</b> <b>Koodi / Code: 721383S</b> <b>Tentin nimi / Exam name: Asset Pricing</b>	
<b>Tiedekunta / Faculty: Oulun yliopiston kauppakorkeakoulu / OBS</b>	
<b>Tentin pvm / Date of exam: 16.05.2016</b>	<b>Tentin kesto tunteina / Exam in hours: 4</b>
<b>Tentin nro / No. of the exam: 2. retake</b>	<b>Opintopistemäärä / Credit units: 6</b>
<b>Tentaattori(t) / Examiner(s): Hannu Kahra</b>	<b>Sisäinen postios. / Internal address: OBS</b>
<b>Sallitut apuvälineet / The devices allowed in the exam:</b> <input checked="" type="checkbox"/> Nelilaskin / Standard calculator <input checked="" type="checkbox"/> Funktiolaskin / Scientific calculator <input checked="" type="checkbox"/> Ohjelmoitava laskin / Programmable calculator <input type="checkbox"/> Muu materiaali, tarkennettu alla / Other material, specified below:	
<b>Tenttiin vastaaminen / Please answer the questions:</b> <input checked="" type="checkbox"/> Suomeksi / in Finnish <input checked="" type="checkbox"/> Englanniksi / in English	
<b>Kysymyspaperi on palautettava / Paper with exam questions must be returned:</b> <input type="checkbox"/> Kyllä / Yes <input checked="" type="checkbox"/> Ei / No	

1. Assume an economy, where the investor's goal is to obtain his/her optimal consumption plan. That means that the consumer-investor solves

$$\max u(c_t) + \beta E_t[u(c_{t+1})]$$

with

$$\begin{aligned}c_t &= e_t - hp_t \\c_{t+1} &= e_{t+1} + hx_{t+1}\end{aligned}$$

where

- $e_t$  is the endowment at time  $t$
- $c_t$  is the consumption at time  $t$
- $p_t$  is the price of asset at time  $t$
- $x_{t+1}$  is the payoff of the asset at time  $t+1$
- $h$  is the amount of the asset the investor chooses to buy at time  $t$
- $\beta$  is the subjective time preference.

Show that

$$\begin{aligned}p_t &= E_t[m_{t+1}x_{t+1}] \text{ and} \\m_{t+1} &= \beta \frac{u'(c_{t+1})}{u'(c_t)}.\end{aligned}$$

**Hint:** Solve the first order condition (FOC) for the optimum by differentiating the objective function with respect to  $h$  and setting it equal to zero. Thereafter solve the resulting equation for  $p_t$ .

2. The Law of One Price.
3. Time series predictability.
4. Time series tests for asset pricing models.