Exam, 16 Jun 2015

I

1

a) *value at risk*: maximum possible loss, in a period, with a certain probability

b) Diversification; risk hedging; risk transfer.

2.

a)

$$\overline{R}_p = E(R_p) = \sum_{n=1}^{N} x_i \overline{R}_i$$

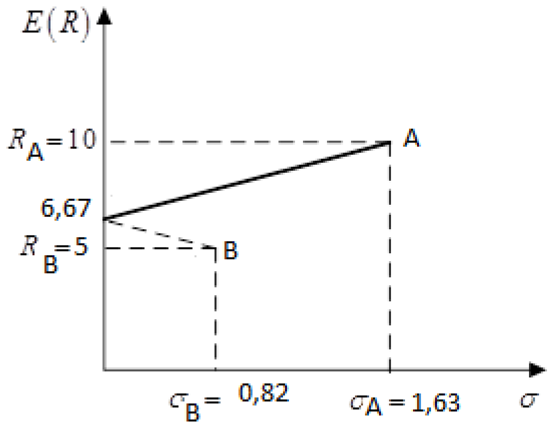
$$\sigma_i^2 = \sum_{m=1}^{M} P_{in}\left[R_{in} - E(R_i)\right]^2$$

	A				B		
	Pi	Ri	pi*Ri		Pi	Ri	pi*Ri
	0.333	12	4		0.333	4	1.3
	0.333	10	3.333333		0.333	5	1.7
	0.333	8	2.666667		0.333	6	2
E(Ri)			10	E(Ri)			5.0
	Ri-R	2		s	Ri-R	-1	
		0				0	
		-2				1	
Dev ^2		4		Dev ^2		1	
		0				0	
		4				1	
Var		2.666667		Var		0.67	10.7
Sdev		1.63		Sdev		0.82	
Covar			-1.33333		- 1.33333		
Correl coef			-1				

$$\sigma_{ij} = \sum_{m=1}^{M} P_m \left[R_{im} - E(R_i)\right]\left[R_{jm} - E(R_j)\right]$$

$$\rho_{ij} = \frac{\sigma_{ij}}{\sigma_i \sigma_j}$$

b)



$$\begin{cases} \bar{R}_p = x_1 \bar{R}_1 + (1-x_1)\bar{R}_2 \\ \sigma_p^2 = x_1^2\sigma_1^2 + x_2^2\sigma_2^2 + 2x_1x_2\sigma_{12} = x_1^2\sigma_1^2 + x_2^2\sigma_2^2 + 2x_1x_2\sigma_1\sigma_2\rho_{12} \end{cases}$$

n = 2

$$\rho_{12} = -1: \ \bar{R}_p = \frac{\bar{R}_1 - \bar{R}_2}{\sigma_1 + \sigma_2}\sigma_p + \frac{\bar{R}_2\,\sigma_1 + \bar{R}_1\,\sigma_2}{\sigma_1 + \sigma_2} \quad \text{or} \quad \bar{R}_p = \frac{\bar{R}_2 - \bar{R}_1}{\sigma_1 + \sigma_2}\sigma_p + \frac{\bar{R}_2\,\sigma_1 + \bar{R}_1\,\sigma_2}{\sigma_1 + \sigma_2}$$

Rp=	2,041	*sigp	+	6,666667
Rp=	-2,041	*sigp	+	6,666667

c)

Rm= 0,1
σm= 0,5
RF= 0,01

$$E(R_p) = x_F R_F + (1 - x_F)E(R_m)$$

E(Rp) = 0,01 xF + 0,1 (1-xF)
E(Rp) = 0,1 - 0,09xF

$$\sigma_p = (1 - x_F)\sigma_m$$

sp= (1-xf) 0,5
sp= 0,5 – 0,5xF
xF = 1 – 2sp

E(Rp) = 0,1 -0,09 (1-2sp)
E(Rp)= 0.01 +0,18 sp

or

$$\bar{R}_p = R_F + \frac{\bar{R}_m - R_F}{\sigma_m}\sigma_p$$

Rp= 0,01+ 0,18sp

$$\left[\frac{\delta E(R_p)}{\delta \sigma_p}\right]_{RMC} = \left[\frac{\delta U[E(R_p)]}{\delta \sigma_p}\right]_{f \cdot util}$$

$$U[E(R_p)] = \alpha + 0{,}5\sigma_p^2$$

dU/dσp = 1σp
dRp/dσp = 0,18
σp= 0,18

$$x_F = \frac{\sigma_m - \sigma_p}{\sigma_m}$$

xF = (0,5-0,18)/0,5 = 0,64

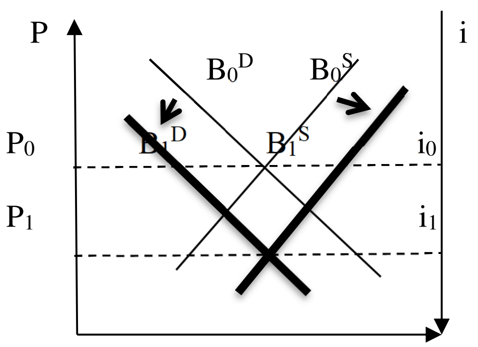
II

3.

a)
R: 0,08 = (P_{t+1} – 100) /100 + 5/100 ⇒ 0,03 = (P_{t+1} – 100) /100 ⇒ P_{t+1} – 100 = 3

⇒ P_{t+1} = 103 eur

b)



c)

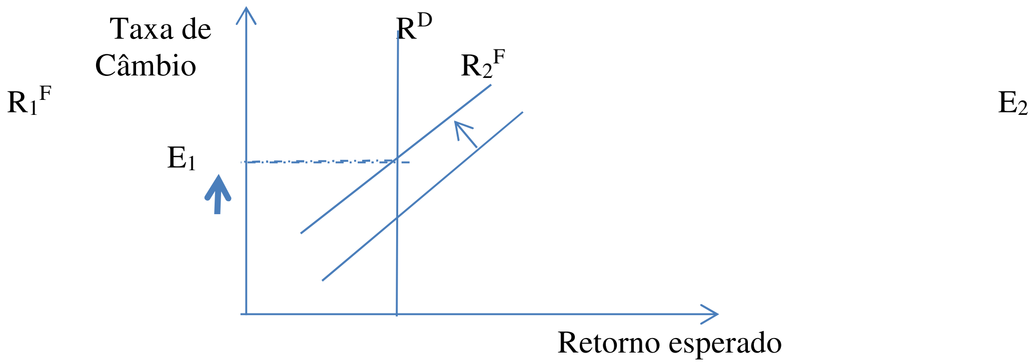
1. Small firms have abnormally high returns.
2. Higher returns in January.
3. Market overreaction.
4. Excessive volatility.
5. Mean reversion.
6. New information not always incorporated in the stock price.

4.

a) Apresente as principais vantagens e inconvenientes dos contratos *forward*. [1,50]

No compensation chamber.
Less liquid.
Tailor made.

b)



III

5. a) b)

				C	2000		
DT		10000		**M1=C+DO**	**8000**		a)
DO		6000		**M2=M1+DP**	**10600**		
DPa2		2000		**M3=C+DT**	**12000**		
DP3m		600		**H=C+R**	**2382,6**		b)
R		**382,6**		Rlv	102,6		
				b	0,167	m	5,263
Rc		200		**c**	**0,200**	m	5,263
rc		0,02					
Rl		80					
rl		0,008					
Rlv		102,6					
dM3=	m		Rlv				
dM3=		540					
dM/M		0,045					

$$m = \frac{1}{b + r - rb}$$

$$m = \frac{1+c}{c + r_L + r_C}$$

5. c)

$$\Delta M = \Delta Y + \pi - \Delta V$$

ΔM	**4,5**	4,5
ΔV	1	
ΔP	**2,5**	
ΔY	**3**	
ΔV	**1**	

6.

a)

- Keynesians - DM^s has real effects: causes interest rate changes, monetary policy transmission channels (see ahead).
- Quantity theory - DM^s only causes changes in nominal income. DM^s increases the price level, does not change relative prices, has little or no effect in the level of real output.

b)

The ECB can buy or sell securities in the secondary market: open market operations.