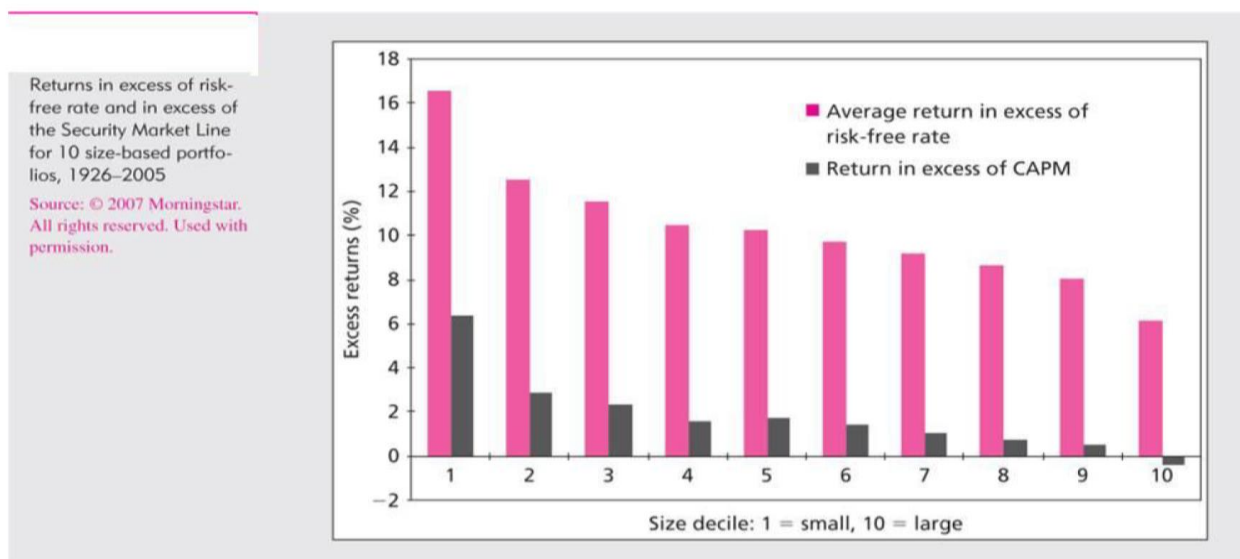


### Question 20 (14 September 2009, Q1).

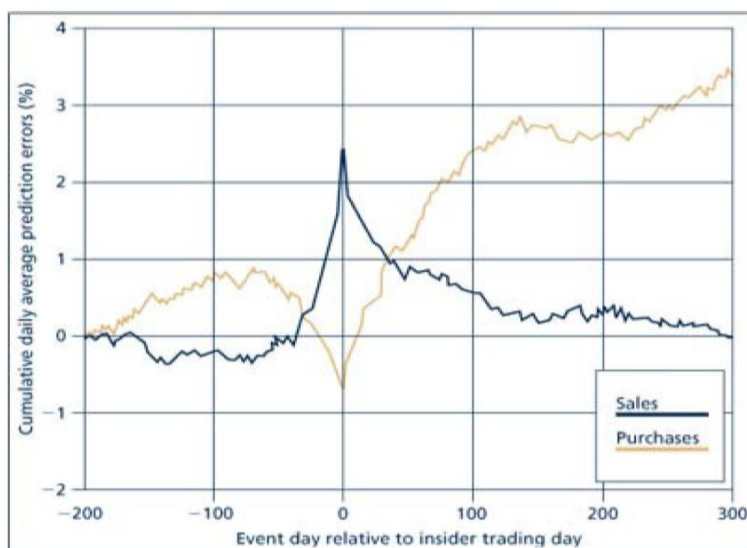
Consider the following graph, presenting the average excess return for 10 portfolios of stocks grouped by size on the NYSE.



1. Define the concept of semi-strong form efficiency.
2. Explain what the graph represents.
3. Indicate what sort of anomaly this graph emphasizes.
4. Discuss alternative models to the CAPM which may explain the evidence reproduced in the graph.
5. Finally, indicate whether in your opinion the graph represents conclusive evidence against semi-strong form efficiency.

### Question 21 (30 June 2010, Q1).

Consider the following graph, representing the average cumulative returns on listed stocks in the days before and after sales (dark line) and purchases (light line) on the part of *insiders*, as reported in the article of Nejat H. Syehun ("Insiders, Profits, Costs of Trading and Market Efficiency?", *Journal of Financial Economics*, 16 (1986)).



How should we interpret such a graph? In particular, what do we conclude with respect to the strong-form market efficiency condition from the analysis of the reaction of stock prices after days of *insiders'* purchases and sales?

**Question 23 (14 January 2014, Q4).**

Consider the following Table from Goetzmann, William N. and Roger G. Ibbotson, (1994, "Do Winners Repeat?", *The Journal of Portfolio Management*, 9-18). In the Table you find the results of the following *cross-section* regression

$$\alpha_T^p = a + b \alpha_{T-1}^p + u^p$$

run on 828 US mutual funds over subsequent periods between 1976 and 1988. In the regression  $\alpha_T^p$  is Jensen's alpha for fund  $p$  estimated using data for the period  $T$ , while  $\alpha_{T-1}^p$  is the corresponding value for the previous period.

$$\alpha_T^p = a + b \alpha_{T-1}^p + u^p$$

T	T-1	$\hat{a}$	$\hat{b}$	$t$ -student
78-79	76-77	0.10	0.34	4.99
80-81	78-79	-0.02	0.25	12.08
82-83	80-81	0.08	0.12	1.48
84-85	82-83	-0.09	0.15	2.26
86-87	84-85	0.00	0.60	10.49

*Note:* The number of observations is 828.

The  $t$ -student statistic pertains to the coefficient  $b$ .

1. Describe and discuss the results in Table. What can you conclude on the persistence in the performance of the US mutual funds?
2. Which criticisms can be raised against Goetzmann and Ibbotson's methodology?

**Question 24 (Mock Exam, Q2).**

Suppose there are three bonds,  $A$ ,  $B$  and  $C$ , which are risk free and present maturity of two years. Assume they present a principal of €100 and an annually paid coupon of respectively 0, 10 and 5 percent. Their respective prices are €91.00, €105.00 and €98.5.

Is there an inconsistency in the bonds' prices? In that case, show how to exploit an arbitrage opportunity and gain a certain profit.