

**ПРИМЕРЫ ЗАДАЧ ВСТУПИТЕЛЬНОГО ЭКЗАМЕНА  
ПО ЭКОНОМИКЕ ДЛЯ МАГИСТЕРСКОЙ ПРОГРАММЫ:**

**«Стратегическое управление финансами фирмы»**

Экзамен письменный. Время проведения - 180 минут.

Допускается использование любого нефинансового калькулятора.

Задания включают 2 раздела, каждый из которых оценивается в 50 баллов. Первый раздел включает задания по макроэкономике и микроэкономике. Второй раздел включает задания по корпоративным финансам.

**Strategic Corporate Finance exam**

**3 hours is given**

100 points are available in total

**There are two parts:**

Micro& macroeconomics part (50 points)

Corporate Finance Part (50 points)

Non-financial calculators are allowed.

**Part 1. Micro& macroeconomics part (50 points)**

1. By state contract between the Government and the University 240 master students should get education. Number of students is defined by equation  $Q = K^{1/4} L^{1/4}$ , where  $K$  is the size of the University buildings,  $L$  is the number of class hours.
  - (a) Rent rate is equal to 2, class hour costs 8. Find the lowest costs of education for one student, 240 students.
  - (b) The Government changes state contract. The University chooses number of students and the Government pays  $p$  for each student. Assume that 4% of students do not defend a graduation thesis and the University do not get money for such students. Find  $p$ , which creates incentives to educate 240 students.
  
- 2 Within the framework of IS-LM model of closed economy, we have consumption function  $C = 0,8(Y - T)$ , where  $Y$  is total output,  $T$  - taxes; investment function  $I = 20 - 0.4r$ , where  $r$  is interest rate; government purchases  $G = 10$ , taxes  $T = 20$ . Nominal money supply is fixed by central bank at the level  $M^s = 50$ ; price

level is equal to  $P=2$ ; demand function for real money balances is given by  $\left(\frac{M}{P}\right)^d = 0,5Y - r$ . Find equilibrium consumption.

## Part 2. Corporate Finance part (50 points)

### Multiple choice questions (15 points)

**1. (5 points).** Consider two firms, C and D, that differ only in terms of their payout policy. Assume perfect capital markets. Both firms are all-equity financed, and hold initially some risky assets (which are identical for both firms), plus \$ 1 million in excess cash. Firm D decides to distribute the excess cash as a dividend to its shareholders, whereas firm C decides to retain the cash within the firm. Which of the following statements is CORRECT?

- 1) After D has distributed the cash dividend investors will require a higher rate of return for holding stock D than for holding stock C.
- 2) After D has distributed the cash dividend investors will require a lower rate of return for holding stock D than for holding stock C.
- 3) The stock price of firm D is expected to drop by more than the amount of the cash distribution.
- 4) The stock price of firm D is expected to react positively (increase) upon the dividend announcement.

**2. (5 points).** BBB Company spent \$3 million two years ago to build a plant for a project. It then decided not to go forward with the project, so the building is available for sale or for a new project. Which of the following statements is CORRECT?

- 1) Since the building has been paid for, it can be used by another project with no additional cost. Therefore, it should not be reflected in the cash flows for any new project or projects.
- 2) If the building could be sold, then the after-tax proceeds that would be generated by any such sale should be charged as a cost to any new project that would use it.
- 3) This is an example of an externality, because the very existence of the building affects the cash flows for any new project the BBB Company might consider.
- 4) Since the building was built in the past, its cost is a sunk cost and thus need not be considered when new projects are being evaluated, even if it would be used by those new projects.

**3. (5 points).** S7S Airline Company currently has an equity beta of 1.2. The company's capital structure consists of \$7 million of equity and \$3 million of debt. The company is considering changing its capital structure. Under the proposed plan the company would increase its debt by \$2 million and use the proceeds to repurchase common stock. (So, after the plan is completed, the company will have \$5 million of debt and \$5 million of equity.) Assume that company uses riskless debt. The company's tax rate is 40 percent. The risk-free rate is 6 percent and the market risk premium is 7 percent. What is the company's estimated WACC if it goes ahead with the plan?

- 1) 9,75%
- 2) 12,27%
- 3) 10,15%
- 4) 11,45%

### Problem solving (35 points)

#### Problem 1. Capital restructuring problem (20 marks)

ABC company is a no growth firm. It financed with debt capital and equity capital. Equity consists of 1000 shares that are traded today at 500 rubles each. Debt is represented by risky perpetual bonds which offer 6% coupon rate and are traded at a 5% discount of their face value. In total there are 200 bonds and each has face value of 2000 rubles. The riskfree rate of return is 5%. ABC's management team is considering a capital restructuring decision. They plan to retire half of existing debt and plan to finance it with additional equity issue. You believe CAPM holds. Corporate income tax rate which the only market imperfection is 20%.

Unfortunately, you are not given the information regarding the systematic level of risk of ABC's equity and has to deal with comparable companies. XYZ company is a perfect candidate for that. XYZ 's line of business is the same as ABC operates. However, XYZ company is 10 times greater in assets. XYZ uses two types of capital. One half is equity which has beta of 1,2. The other half is riskless debt. Use standards assumptions about interest tax savings' systematic level of risk. Return on the market portfolio is 15%.

Suppose, ABC's managers will firstly make the announcement of capital structure changes. Afterwards they will issue equity and, finally, will use the proceedings to retire debt. Answer the following questions:

Question 1.1. (10 marks) Determine the ABC firm value, the ABC stock price and the number of shares after capital restructuring.

Question 1.2. (5 marks) Determine the change in ABC equity systematic level of risk (or required return).

Question 1.3. (5 marks) In capital restructuring problem above you were asked to determine the change in ABC equity systematic level of risk (or required return). Discuss in details what are the reasons for this change. Mention that we have corporate tax as the only market imperfection. Support you answer with calculations if necessary.

#### Problem 2. Financing&valuation problem (15 marks)

A firm in Saransk decided to open a hotel on the eve of the World Cup in 2018. Firm paid \$ 10 000 for the sales forecast.

- Hotel is going to operate during 4 years. During these four years hotel is planned to serve 2500, 3000, 6000, 10000 visitors. Average competing prices are planned to be \$100; 200; 250; 350.
- The company owns the building, that will be used for the project. Current market price of this building is \$1.2 mln.

- The company will have to spend additional \$ 0.5 mln. on equipment that will be linearly depreciated to \$0.1 mln..
- COGS will be 90%, 70%, 60%, 50% during these 4 years. Company has also to reserve 10% of the forecasted revenues as working capital.
- Corporate tax rate is 20%.

The company will finance 50% capital expenditures and investments in net working capital with riskless debt that will be repaid after 4 years. Financial analyst compared firm's leverage with its competitor's capital structure that acquired 40% of its capital with riskless debt ( $r_d=10\%$ ). The calculated beta of the twin company stock using market index ( $R_m=25\%$ ) as a proxy for market portfolio is 1,5.

**Question 2.1. (15 points)** State all needed assumptions for your analysis. Build up cash flows of the project. Give your advice based on APV criteria, taking into account both investment and financing effects of the project.