

Профили:

«Стратегическое управление финансами фирмы/
The Strategic Corporate Finance»

КОД – 181

Время выполнения - 180 минут, язык ответов – английский.

Максимальное количество баллов – 100.

ОБЩАЯ ЧАСТЬ. Макро и Микроэкономика. Задачи на 50 баллов

Problem 1 (25 points)

The investor has a wealth of 16 MU (monetary units). He is considering participation in a business project. The project with probability 1/4 will result in gain of 48 MU, and in case of failure the investor will lose 12 MU.

Question 1-1(5 points). Suppose that the investor is risk averse. What can be said about his decision to participate in the project or not to?

Question 1-2(10 points). In Questions 1-2 and 1-3 suppose that the preferences of the investor are representable by a utility function with the expected utility form (the von Neumann-Morgenstern expected utility function), and that a Bernoulli utility function is $u(x) = \sqrt{x}$.

How does this additional information change your answer in question 1-1? Illustrate the choice of the investor in the wealth-utility space (mark on the figure the expected payoff, the value of expected utility in case of participation in the project, the certainty equivalent of the project). Illustrate the choice of the investor in the contingent goods space (mark on the figure the points from which the investor chooses, the typical indifference curves, the slope of the tangent to the indifference curve on the certainty line).

Question 1-3(10 points). Suppose the investor can consult a consulting company, which is able to tell him project successfulness with guaranty. However, for the services of a consulting company he needs to pay 7 MU. Will the investor apply to the consulting company? Illustrate the choice of the individual in the contingent goods space (the figure should be clear to understand from what the investor chooses and what his decision is). Show in the figure the maximum consulting company fee that the investor agrees to pay (it is unnecessary to look for it).

Problem 2 (25 points)

Consider the closed economy in the short run with rigid prices and nominal wages. Price level is equal to 1. The Keynesian consumption function is given by the following expression: $C = 40 + 0.8Y_d$, where Y_d is disposable income. Income tax rate is equal to 25%. Government spending is exogenous and equal to 40, transfers are absent. Investment function is the following: $I = 140 - 10i$, where i is the nominal interest rate in the economy measured in percentages. Nominal money supply is exogenous and equal to 100. Keynesian money demand function is given by: $m^d = 0.2Y - 5i$.

Question 2-1(5 points). Find the equilibrium levels of Y , i and the government budget balance.

Question 2-2(8 points). Assume that the central bank targets nominal interest rate at the equilibrium level found in (1), while due to the exogenous shock autonomous investment increases by 60. Find the corresponding change in the nominal money supply and the new equilibrium level of income. Illustrate these changes on the IS-LM diagram and explain intuitively.

Question 2-3(8 points). Central bank does not target nominal interest rate, while due to the exogenous shock autonomous investment increases by 60. Find the corresponding change in the income tax rate, if the government wants to keep the equilibrium level of income found in (2-1) unchanged. Illustrate these changes on the IS-LM diagram and explain intuitively. What will happen to the nominal interest rate in equilibrium?

Question 2-4(4 points). Assume that as in (2-2) central bank targets nominal interest rate and increases nominal money supply to offset the influence of the investment shock. But the government wants to keep the equilibrium level of income found in (2-1) unchanged. How should government spending be changed? What will happen to the nominal interest rate in equilibrium?

II. СПЕЦИАЛЬНАЯ ЧАСТЬ. БЛОК 2. 50 баллов по блоку 2

PART 2. Corporate Finance

Solve the problems 3 and 4 given below

Problem 3 (25 points)

You are asked to advise on an investment project. Company BCD plans to implement a project that will be financed with debt and equity. Shareholders have decided to implement the project with help of a separate new entity – company Z. Company Z will be created specifically to realize the project.

You are given the following info regarding the project:

Project has 3 years maturity. Sales are expected to be 400, 600 and 800 mln. rubles for the corresponding three years. COGS (excluding depreciation expense) will comprise 60% of Sales. Capital expenditures will reflect acquisition of equipment for 270 mln. rubles. It will be fully depreciated using straight-line approach. Net working capital management guidelines require current assets to be at 30% of expected EBITDA in a corresponding year. Current liabilities are planned to be at 10% of expected COGS in a corresponding year. Corporate income tax rate is 20%. Interest rate on debt capital is 10%. Required return on unlevered equity capital is 20%.

Project will be financed with debt and equity capital. Debtholders can provide 120 mln. rubles with 10% required return. The rest will be financed with equity capital.

Managers agreed to a special debt repayment scheme. 120 mln. of debt will be retired in three equal installments of 40 mln. at the end of each of three years. All of three repayments will be financed with equity issues. Such a repayment scheme will result in changing capital structure. After the final debt repayment company Z will realize itself to be financed only with equity.

Question 3.1 (5 points) Project Net Income for 3 years. Assume the project is financed with equity.

Question 3.2 (10 points) Project investment cashflows. Assume the project is financed with equity only.

Question 3.3 (5 points) Determine the APV of the project. Should the project be implemented.

Question 3.4 (5 points) Determine the change of equity value at the moment the project finishes after 3 years of implementation. State assumptions.

Problem 4 (25 points)

A company X is all equity financed. It last year's average equity was \$1500. Accounting rate of return on equity always was and is planned to be 10% forever. Management of the company follows a NO growth policy which leads to 100% payout policy. Management utilizes company's assets in such a way that they completely renew every four years. In other words company assets have 5 years of economic life. Suppose there is no net working capital used in X's business. Capital market analytics say that the required return on X's equity is 16%.

Today is December 31, 2020, and payout together with investment decisions have to be made. Shareholders of the company have just made a hard decision to change the whole management team. New managers received a task to increase the value of X's stock without changing the whole business model. Managers cannot influence company's efficiency. They offer to increase capital spending (follow stable growth model). Managers offer to reinvest 20% of net income. This plan is going to be released to the public on January 1, 2021 and cash will be delivered to shareholders right after that (suppose delivery happens on the same date). There are 100 share outstanding today.

Question 4.1 (5 points) Determine the value of stock under old zero growth policy.

Question 4.2 (10 points) Determine the value of stock under new stable growth policy.

Question 4.3 (5 points) There should be a clear explanation for tradeoff between dividend stream patterns and stock values. Zero growth policy offers greater dividends per share (DPS) at the beginning and no growth; stable growth policy offers smaller DPS from the beginning which grow in the future. Do you think you should always expect a stock value to increase when a higher growth rate (greater capex, or reinvestment rate) is proposed? Explain

Question 4.4 (5 points) Offer optimal investment policy that will maximize the value of the X company.