404 Book Homework

Jiaqi Li

Q11.32

In the supermarket, price is fixed for products assume that people will not bargain with the seller. There is not much transaction cost (if walking to or driving to the supermarket is not counted) but there are taxes for buying and selling the products in the supermarket. There are finite number of buyers and sellers. Thus, not all assumptions are satisfied, which means the supermarket is **NOT** a perfect market.

Q11.33

Perfect market assumptions are:

1. No differences in opinion and information
2. Infinitely many investors and firms
3. No transaction costs
4. No taxes

Q11.34

The project will have an return of 5000\*0.12 = $600

If we have 2000: we can earn 600 – 3000\*0.15= $150 if we invest in the project.

we can earn 2000\*0.1 = $200 if we lend the money.

Thus, in this case, we should not take the project.

If we have 3000: we can earn 600 – 2000\*0.15= $300 if we invest in the project.

we can earn 3000\*0.1 = $300 if we lend the money.

Thus, in this case, we are indifferent in lending the money or investing the project.

If we have 4000: we can earn 600 – 1000\*0.15= $450 if we invest in the project.

we can earn 4000\*0.1 = $400 if we lend the money.

Thus, in this case, we should take the project.

Q11.35

1. Expect return = 12% - 6% = 6%

1+6% = p\*(0%) + (1-p)\*(1+12%) ⇒ p = 5.4%

1. Quoted default premium = 12% - 6% = 6%
2. Default probability = 5.4%

Expected default premium = 5.4%

Q11.36

If the world is risk neutral, nobody will care about the risks that one may default so that the default premium will be 0. This means that in the risk neutral world, the promised rate of return is equal to the expected rate of return.

Q11.37

There are a lot of covenants and restrictions in the S-4 file of the El Torito company.

These covenants include Restricted Payments, Incurrence of Indebtedness and Issuance of Preferred Stock, Liens, Dividend and Other Payment Restrictions Affecting Subsidiaries, Merger and Consolidation or Sale of Assets, Transactions with Affiliates, Business Activities, Limitation on Capital Expenditures, etc.

Q11.38

1 million dollars will yield 1+0.15/12 = 1.0125 in 1 month, which means 1 million will earn $12500 if liquidated after 1 month. One can buy (1 million/215) = 4651.16 bonds. The bid-ask spread cost would be 4651.16\*(215-212)=$13953.48. Thus, investment made on this corporate bond will end up with an loss.

In contrast, the T-bonds will yield 1+0.06/12 = 1.005 in one month and there will be no bid-ask spread cost, which means that 1 million invested in T-bond will earn a revenue of $5000.

Thus, I should buy T-bonds.

Q11.39

Exxon Mobil Cop

|  |  |  |  |
| --- | --- | --- | --- |
| Bid | Ask | One-time Transaction  (<30 shares) | One-time Transaction  (>30 shares) |
| $74.72 | $74.76 | $6.95 | $4.95 |

$10000 can buy 10000/74.76 ≈ 133 shares > 30 shares.

Then, round-trip transaction cost = (74.76 – 74.72)\*133 + 2\*4.95 = 0.04\*133 + 9.9= $15.22

Q11.40

Let X = total asset. Then the portfolio will contain X/30 shares of stocks. One-time transaction cost on rebalancing 25%of the portfolio will generate X/30 \* $0.15 \* 0.25 = $0.00125X fee. There will be 12 times on rebalancing, so the total transaction cost in one year will be 0.00125X \* 12 = $0.015X. Then the expected return will be (0.12X – 0.015X)/X = 0.105 = 10.5% > 9%. Thus, this is a good strategy.

Q11.41

One-day transaction cost = (10000000/30)\*0.3\*0.1 = $10000 which is 0.1% of the total asset.

Then, one-year transaction cost will be 0.1%\*252 = 25.2% of his total asset.

His salary will be 200000/10000000 = 2% of his total asset.

Thus, he has to earn an 25.2% + 2% = 27.2% to cover the transaction cost and his salary.

Q11.42

1. Ordinary Income Tax: this will have tax brackets for different group of people (single, married, head of household) and each bracket will indicate tax rates based on one’s income interval. Higher income will have to pay higher tax. For example, a single man/woman who earns below $9700 will be taxed 10% of his/her income.

Interest Income Tax: Interest income will be same as one’s ordinary income tax

Dividend Income Tax: Usually about half of the ordinary income tax

Capital Gains Tax: for short -term (< 1 year) it will be similar to ordinary income tax; for long-term (>1 year) it will be much lower than ordinary income tax, and it will only be taxed when realized.

1. 6 million \* 0.21 = 1260000
2. 2 million ordinary income tax = 150689.5+37%\*(2000000-500000) = 705689.5

1 million interest income tax = 150689.5+37%\*(1000000-500000) = 335689.5

3 million realized long-term capital gain tax = (3000000 – 425800)\*20%

+(425800-38601)\*15%=572919.85

Q11.43

6% - 6%\*40% = 3.6%

Q11.44

(1-τ )\*5.7%=3.99% ⇒ τ =30%

Q11.45

1. VWITX yields 2.31%
2. Tax is exampted from municiple bond
3. VBIIX yields 3.16%
4. (1-τ )\*3.16%=2.31% ⇒ τ = 26.9%

Q11.46

At he ed of 10 year:

Before-tax ordinary income every year = 60000

Ordinary income tax = (60000-10000)\*0.33 = 16500

Before-tax capital gain = 800000

Capital gain tax = 800000\*0.2 = 160000

Return of taxable bond = 0.08\*(1-0.33) = 0.0536 < 0.06 ⇒ discount rate should be 0.06.

NPV = -1000000 + + = -322463.6

Q11.47

(1-0.25)\*0.2 = 0.15 > 0.14

Thus, take 15% as discount rate.

NPV = 3000\*(1-0.25)/(1+0.15)=1956.52

Q11.48

Discount rate = (0.1\*(1-0.4)-0.02) = 0.04

After-tax cash flow = 1000000\*(1-0.4) = 600000

NPV of winning = 8154196

Return = -1 + 8154196/14000000 = -0.41756 < 0

Thus, this lottery is not a good investment.