

Problem 1. Jim, an old friend from high school years, wants to borrow some money from you to invest in a business (that is what he claims). He promises to pay back \$10,000 to you next year. Obviously you won't lend that kind of money to him without receiving a bond from him. Moreover, you suspect that the business he is investing in is a shady one. To get compensated for the risk you are taking, you charge Jim 60% interest on the loan (which is rather cruel, if you ask me). In other words, you are willing to pay only _____ dollars for his bond (this is how much you are willing to lend him today).

After some research you find out that the business Jim is interested in is risky, but not as bad as you initially thought. So you decide to charge him only 25% for the loan; which means that you are now willing to pay _____ dollars for the bond.

Answer 1.

$$P(1.60) = \$10000 \implies P = 6250.$$

$$P(1.25) = \$10000 \implies P = 8000.$$

Problem 2. Brad wants to borrow \$1,000 from you for a year. Currently the general price level is 100. You expect the price level next year to be 105. You lend him the money and he promises to pay you back \$1,070 next year. When next year comes, the price level turns out to be 109. In this story:

- The nominal interest rate = _____ percent
- Expected rate of inflation = _____ percent
- Actual inflation rate = _____ percent
- The ex-ante real interest rate = _____ percent (ex-ante means before the fact, or expected this year)
- The ex-post real interest rate = _____ percent (ex-post means after the fact, or actual next year)

Answer 2.

- Nominal interest rate solves $1000(1 + R) = 1070$, which gives $R = 7\%$.
- $\pi^e = \frac{105 - 100}{100} \times 100 = 5\%$
- $\pi = \frac{109 - 100}{100} \times 100 = 9\%$
- Ex-ante real interest rate: $r^e = R - \pi^e = 7 - 5 = 2\%$
- Ex-post real interest rate: $r = R - \pi = 7 - 9 = -2\%$

Problem 3. Brad wants to borrow \$1,000 from you for a year. Currently the general price level is 100. You expect the price level next year to be 105. You lend him the money and he promises to pay back \$1,070 next year. When next year comes, the price level turns out to be 109.

True or False. In this story, when the next year comes, Brad will be better off than expected, but you will be worse off than expected.

Answer 3. *True.* A higher than expected rate of inflation benefits borrowers and hurts lenders. Brad is borrowing, so Brad benefits. You are lending, so you kinda get screwed over. Dammit, Brad.

Problem 4. *True or False.* All else the same:

- (a) If market participants expect higher inflation in the future, the quantity of loanable funds demanded will increase. This will cause a movement along the demand function for loanable funds.
- (b) If market participants expect higher inflation in the future, the quantity of loanable funds supplied will increase. This will cause a movement along the supply function for loanable funds.
- (c) If the nominal interest rate increases, the quantity of loanable funds demanded will increase. This will cause a movement along the demand function for loanable funds.
- (d) If the nominal interest rate decreases, the quantity of loanable funds supplied will increase. This will cause a shift in supply function for loanable funds.
- (e) If firms and households expect better economic conditions in the future, demand for loanable funds will shift to the right.
- (f) If credit risk increases, supply of loanable funds will shift to the right.

Answer 4.

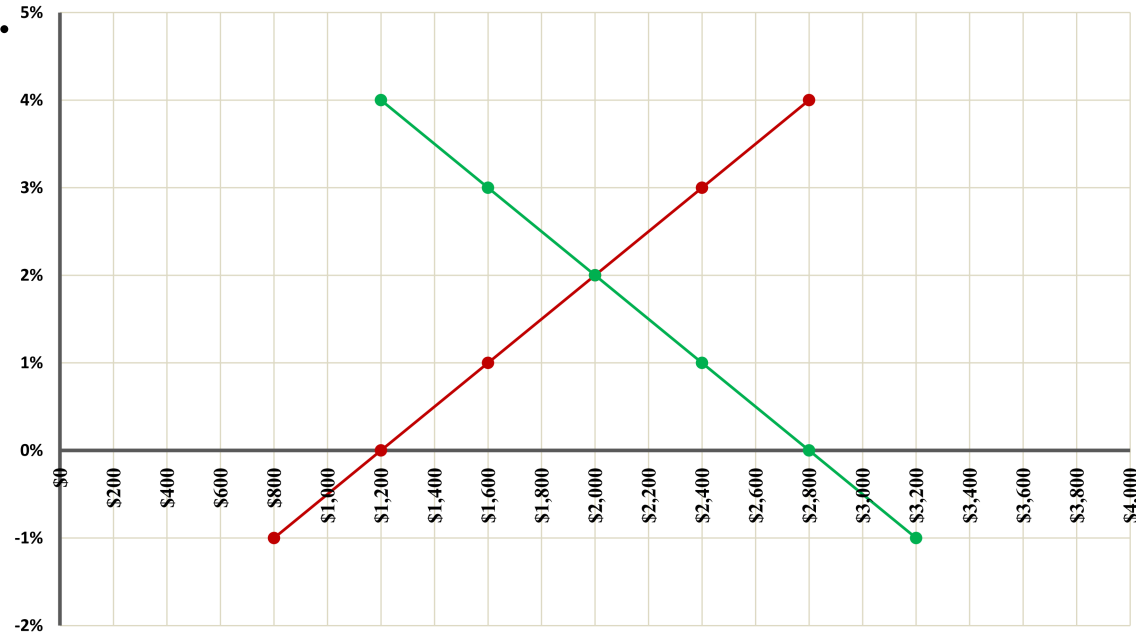
- (a) *True.* Given that the nominal rate has not yet changed, the increase in the expected inflation rate will reduce the real rate by the same amount. This means borrowers want to borrow more, causing a movement along the demand function and an increase in quantity demanded.
- (b) *False.* Given that the nominal rate has not yet changed, the same reduction in the real rate means lenders want to lend less, causing a movement along the supply function and a decrease in quantity supplied.
- (c) *False.* The demand function is downward sloping, so a higher nominal interest rate means a lower quantity demanded.
- (d) *False.* Supply is upward sloping. An decrease in the nominal rate therefore means a lower quantity supplied. Also there is no shift.
- (e) *True.* People are more willing to borrow if they expect good things in the future—there is less need to “save for a rainy day.”
- (f) *False.* Credit risk refers to the chance that a borrower may not be able to pay back the loans in whole or in part. Lenders will require a higher interest rate for every quantity loaned, so supply will shift to the left.

Problem 5. *True or False.* According to the Fisher Effect, if the expected rate of inflation increases, but if the demand for and supply of loanable funds do not change, the ex-ante real interest rate will decrease.

Answer 5. *False.* This isn't even a statement of the Fisher Effect. The Fisher Effect states that when the inflation rate is expected to increase, the nominal interest rate will increase by the same amount to keep the real interest rate unchanged. This can be seen by decreasing supply and increase demand both by the change in expected inflation.

Problem 6. *True or False.* You borrow money from a bank for your education. This is an example of direct finance.

Answer 6. *False.* **Direct finance** means the lender of funds (who has surplus funds) is giving directly to the borrower of funds (who has deficit funds). **Indirect finance** is when the lender gives their surplus funds to a financial intermediate, e.g. a bank, and then the bank lends the money to borrowers.

Problem 7.

Consider the information in the Loanable Funds Graph and assume that the expected rate of inflation is 2%.

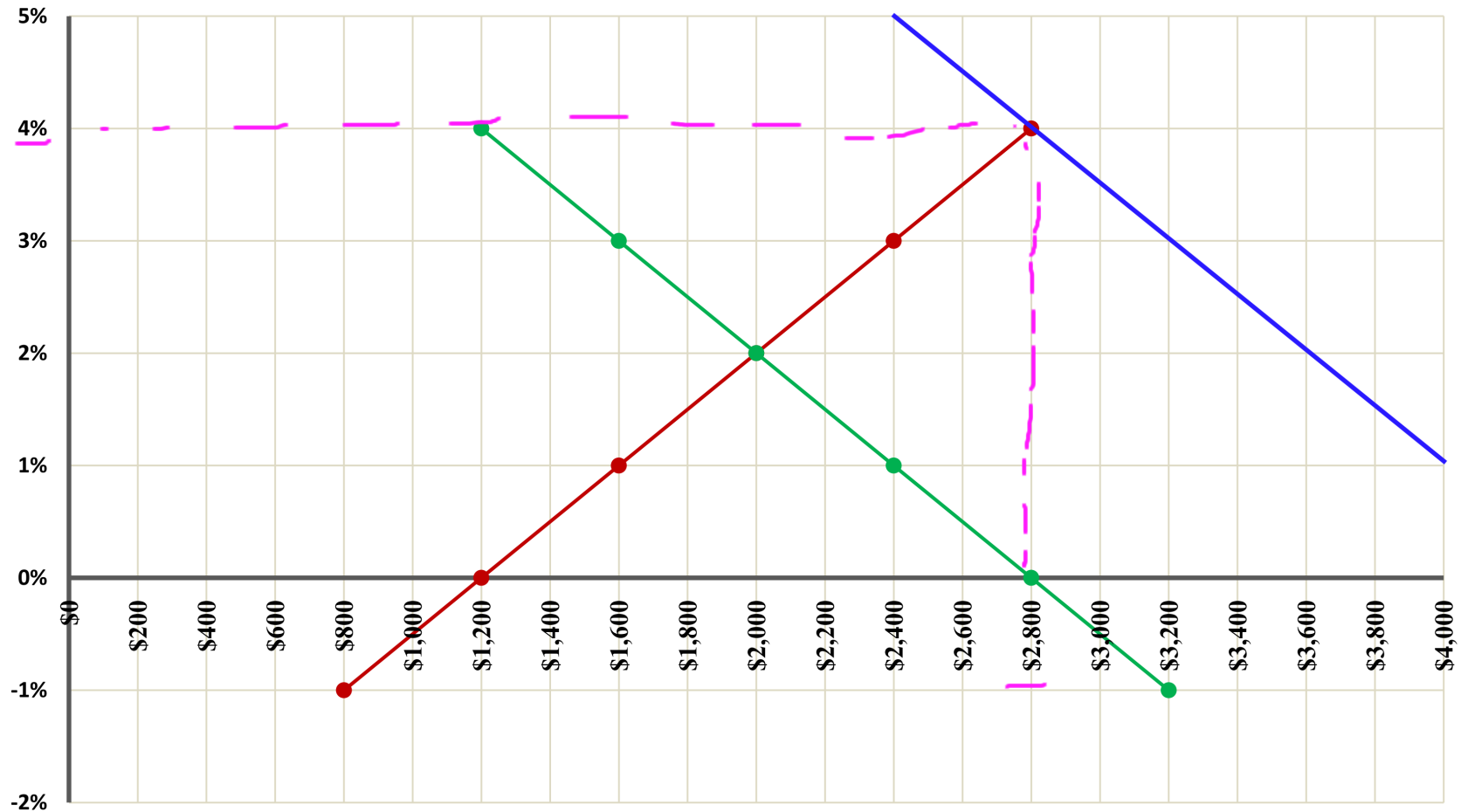
- (a) What is the the equilibrium nominal interest rate?
- (b) What will be the new equilibrium ex-ante real interest rate if people revise their expectations of inflation upward? In particular assume that they now expect 5% inflation for the future.

Answer 7.

- (a) They intersect at a real interest rate of 2%. The expected rate of inflation is 2%. Therefore the nominal interest rate will be 4%.
- (b) Use the Fisher effect. The nominal interest rate will change so that the real interest rate is unaffected, i.e. it will still be 2%.

Problem 8. Consider the information in the Loanable Funds Graph and assume that the expected rate of inflation is 2%. The demand for loanable funds in the graph consists of the demand by households and firms. Currently, the government is not borrowing any money, because its tax revenue is sufficient to finance its expenditures. Now a war breaks out and to finance the purchase of additional military equipment the government has to borrow in the loanable funds market. So it comes to the loanable funds market and borrows \$1,600 to finance the war effort. The government's borrowing decision is not affected by the real interest rate. So demand for loanable funds increases by \$1,600 at every value of the real interest rate. The new equilibrium real interest rate will be what percent?

Answer 8. Shift the demand to the right by \$1600. Then the new intersection comes at the interest rate of 4%.



Problem 9. Consider the information in the Loanable Funds Graph and assume that the expected rate of inflation is 2%. The demand for loanable funds in the graph consists of the demand by households and firms. Currently, the government is not borrowing any money, because its tax revenue is sufficient to finance its expenditures. Therefore, the equilibrium nominal interest rate equals what percent?

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Answer 9. Use the Fisher effect. We know that the equilibrium real interest rate was 4% after the government borrowing. Previous expected inflation was 2%, so the nominal interest rate was 6%.

But now people expect the inflation rate to jump to 5%. Therefore the new equilibrium nominal interest rate will be $4\% + 5\% = 9\%$.

Problem 10. Consider the information in the Loanable Funds Graph and assume that the expected rate of inflation is 2%. Forget about the increased demand by the government and all those depressing news in the previous two questions. This time assume that due to an increase inflation volatility both demand for and supply of loanable funds decrease by 800 dollars. The new equilibrium real interest rate will be what percent, and the new equilibrium quantity of loanable funds will be how many dollars?

Answer 10. Shift things.

