Problem 1. Define the following terms and give an example of each:

(a) asset

(b) nominal wealth

(c) physical asset

(d) financial asset

(e) intangible asset

Answer 1.

(a) An asset is anything that has value because it is expected to bring benefits to the owner in the future. Your college degree will be an asset because it will open up a lot of employment opportunities for you.

(b) Nominal wealth is the market value (i.e. the dollar value) of all assets own by an individual. If you own a house worth $500,000 and a car worth $20,000, then your nominal wealth is $520,000.

(c) A physical asset is a *tangible* thing (i.e. actual object that you can see and touch) that has some non-monetary benefits. A house provides shelter.

(d) A financial asset is a tangible thing that provides some monetary benefit. If you own stock in a company, you expect the value of that stock to increase over time which means you become richer.

(e) An intangible asset is a non-physical thing. If you teach yourself how to code, that is an intangible skill because you can't touch skill; but being able to code makes you more employable.

Problem 2. A financial asset that is traded in financial markets is specifically called

(a) a liquid asset

(b) a tradable asset

(c) a security

(d) a bond

(e) none of the above

Answer 2: c. Not all financial assets can be traded in the market, e.g. your checking account. Assets that are called securities and financial markets are also called securities markets.

Problem 3. What is a bond? What is the difference between a discount bond and a coupon bond?

Answer 3. A bond is just a way of borrowing money. The entity that wants to borrow money issues a bond, and later on they have to pay that money back, usually with interest.

A discount bond means the money is borrowed and then gets paid back all at once in the future. If I want to borrow \$100 and pay you back in a year with 5% interest, then I issue a one-year \$100 bond with a 5% annual interest rate. You buy the bond by giving me \$100 today; this is the *price* of the bond. One year from now I give you back \$105; this is the *face value* of the bond.

A coupon bond means the money is borrowed and then gets paid back in fixed increments called *coupon payments*. I might issue a one-year \$100 coupon bond with \$10 monthly coupon payments. That means you give me \$100 today, and I pay you back \$10 each month for one year.

Problem 4. The relationship between interest rates and bond prices is

(a) positive

(b) negative

(c) neutral

(d) getting serious but bond prices are afraid of commitment

(e) none of the above

Answer 4. Intuition: when you pay less for the same thing, you benefit more. Discount bonds are denominated in terms of their face value, i.e. what the lender gets back at the maturity date. Consider a bond that has a face value of $F = \$100$. You buy the bond for $P = \$80$ and your confused friend buys the same bond for $P' = \$90$.

So you pay \$80 today, you get \$100 in the future, so your rate of return (i.e the interest rate) is

$$R = \frac{\$100 - \$80}{\$80} = 25\%.$$

Your friend though paid \$90 today to get \$100 in the future, so their rate of return is

$$R' = \frac{\$100 - \$90}{\$90} = 11.11\%.$$

Problem 5. The process through which the rates of return on identical assets are equalized is called

(a) financial market transaction

(b) arbitrage

(c) securities market

(d) investment

(e) none of the above

Answer 5: b. Arbitrage is the fancy name for that old cliche "buy low, sell high." Suppose you have two assets, A and B, that are identical except suddenly the price of A goes up and the price of B goes down. There is now an excess supply of asset A because the price is high; and an excess demand for asset B because the price is low.

People will then buy a lot of asset B at the low price and sell it in another market at the high asset A price, for which they will earn a profit. Since so many people want to buy asset B, its price will be driven up. And since not many people want to buy asset A, its price will be driven down. This process will equalize the two prices so that there is no more profit opportunity. The price at which the two identical assets equalize is sometimes called the *fair value*.

An illustration is shown on the next page; the fair value is the point where supply and demand intersect for each market.

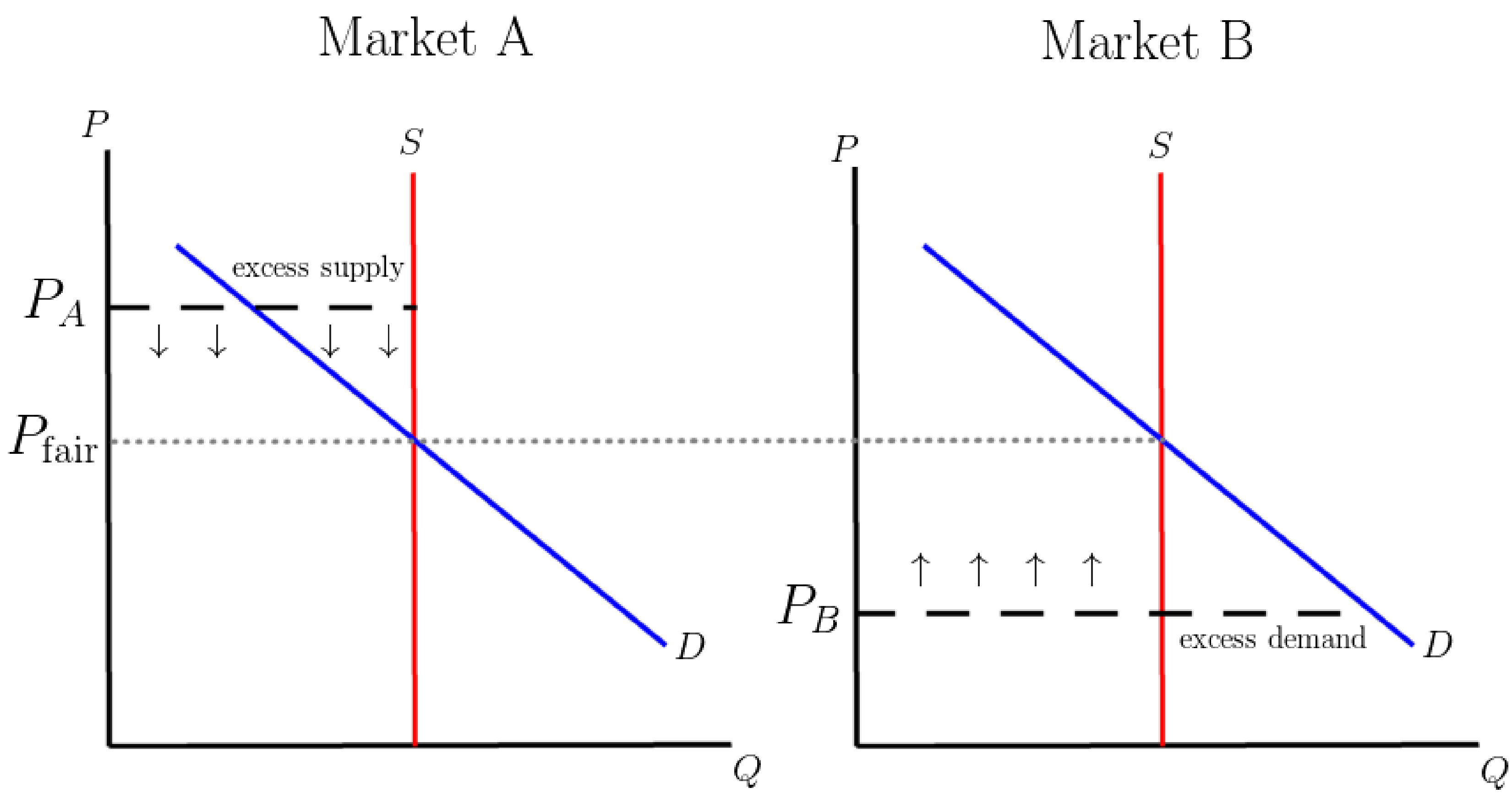

Figure 1: People buy a lot of asset B because it's cheaper, which drives its price up. The assets get sold in market A at a higher price for a profit, which then drives the price of asset A down. The two prices will eventually equalize at the fair price. Note that in the age of the Internet, this process happens *very* quickly because information is so readily available and trading assets is so fast and simple.

Problem 6. Asset A can be converted into cash faster than Asset B without any loss in value. We say that Asset A is

(a) more tradeable

(b) more liquid

(c) more cashable

(d) more fluid

(e) none of the above

Answer 6: b. Liquidity refers to how quickly an asset can be converted into cash. In general, undesirable qualities will increase the interest rate of an asset (because otherwise no one would buy them), all else equal. In other words, undesirable qualities require compensation in the form of a higher rate of return.

- A riskier asset, all else equal, will have a higher interest rate.
- A less liquid asset, all else equal, will have a higher interest rate.
- A heavily-taxed asset, all else equal, will have a higher interest rate.

Problem 7. What is the difference between company-specific and market risk? How can you minimize each type of risk?

Answer 7. Company-specific risk is the risk you face from investing in a specific company, go figure. If you buy stock in only Tesla and Tesla stock falls in value because Elon Musk smokes pot on a podcast, then the value of your portfolio will go down. You can minimize the company-specific risk by **diversifying** your portfolio, that is, buying stocks from different companies in uncorrelated sectors of the economy. The idea is that if Tesla stock value suffers, that doesn't somehow mean Dunkin' Donuts are making dubious decisions, so Dunkin' Donuts stock could still be performing well. The good performance of the Dunkin' Donuts stock then mitigates some of the losses of the poorly-performing Tesla stock.

Market risk, on the other hand, cannot be diversified away from. If the entire market is doing poorly during a recession, then that means both Dunkin' Donuts and Tesla are probably doing poorly.

Problem 8. Chris buys stock of Chevron for \$50. After a few weeks, he collects dividends of \$2 and sells it for \$52. Find Chris's rate of return from this investment.

Answer 8. The future payout \$52 + \$2 = \$54. Since the stock was purchased for \$50, this means the return is \$4. And therefore the rate of return is

$$\frac{\text{Future Payout} - \text{Asset Price}}{\text{Asset Price}} = \frac{\$54 - \$50}{\$50} = 8\%.$$

This is classified as a capital gain because the rate of return is positive.