18 FINANCIAL MARKETS

1.

a) Assuming that the other 50 percent is put in financial assets we get:

Assets		*Liabilities and owner's equity*	
Financial assets	4000	Liabilities	6000
Real assets	8000	Equity	6000
Total	*12000*	*Total*	*12000*

b)

Assets		*Liabilities and owner's equity*	
Financial assets	3000	Liabilities	5000
Real assets	8000	Equity	6000
Total	*11000*	*Total*	*11000*

2.

a) If the risk-averse investor invests 50 000 euro and is promised a 20 percent return (60 000 euro) she can be sure to get that the worst case scenario. who What contract would you suggest between the entrepreneur and the investor?

b) The entrepreneur has to put up 50 000 of his own money.

3.

a) The expected return is ten percent: $0.5\cdot 0.5-0.5\cdot 0.3=0.25-0.15=0.10$.

b) In the bad outcome only 70 percent of the money is recovered so the maximum investment by outside lenders is 70 percent of the investment.

c) Shareholders make 30 percent of the investment and they get a zero gross return in the bad case. In the good outcome they recover their money plus a return of 50 percent of the investment. Their expected gross return is $\frac{0.5\cdot 80+0.5\cdot 0}{30}=\frac{4}{3}$ so the expected net return is one third, 33.3 percent.

d) The maximum net return is 50/30=166.6 percent and the minimum net return is minus 100 percent for the shareholders

4.

a) $S=\frac{d}{r}=\frac{10\text{ million}}{0.05}=\frac{10\text{ million}}{0.05}\cdot\frac{20}{20}=200\text{ million}.$

b) $S=\frac{d}{r-g}=\frac{10\text{ million}}{0.05-0.03}=\frac{10\text{ million}}{0.02}\cdot\frac{50}{50}=500\text{ million}.$

c) Let the risk of bankruptcy be p. Then we can modify the calculation in the text:

$$S=\frac{d}{1+r}+(1-p)\frac{(1+g)d}{(1+r)^2}+(1-p)^2\frac{(1+g)^2d}{(1+r)^3}+(1-p)^3\frac{(1+g)^3d}{(1+r)^4}\ldots$$

$$=\frac{d}{1+r}\left(1+\frac{(1-p)(1+g)}{1+r}+\left(\frac{(1-p)(1+g)}{1+r}\right)^2+\left(\frac{(1-p)(1+g)}{1+r}\right)^3..\right)$$

$$=\frac{d}{1+r}\cdot\frac{1}{1-\dfrac{(1-p)(1+g)}{1+r}}=\frac{d}{1+r-1-g+p+pg}=\frac{d}{r-g+p+pg}\approx\frac{d}{r-g+p}$$

$$=\frac{10\text{ million}}{0.05-0.03+0.01}=\frac{10\text{ million}}{0.03}\cdot\frac{100}{100}\approx 333.3\text{ million.}$$

5. Probably not. The combination of liquid debt and illiquid lending makes banks vulnerable to bank runs if confidence is shaken and unexpected losses will always occur. With high reliance on wholesale financing, banks can still be subject to bank runs.

6. See section 18.7.

7. What matters for aggregate demand according to the theory presented in Chapters 3 and 4 is the expected real interest rate that firm and households pay on their loans, and get on their savings. If the margin increases between banks' lending rates and the repo (or federal funds) rate it makes sense to take account of that when setting the interest rate. One could use the Taylor rule but subtract the interest rate margin that is in excess of what it normally is.

8. The Taylor rule that was presented in Chapter 10 is:
$i=0.02+\pi+0.5(\pi-0.02)+0.5\hat{Y}$.

a) $i=0.02+0+0.5(0-0.02)-.5\cdot 0.04=0.02-0.01-0.02=-0.01$

b) $i=0.02-0.01+0.5(-0.01-0.02)-0.5\cdot 0.04=0.02-0.01-0.015-0.02=-0.025$

c) The interest rate cannot be far below zero because then firms and households prefer to hold cash/monetary base with zero interest.

9. Normally this is true because lower wage increases imply lower inflation and the central bank reacts to lower inflation by reducing the interest rate more than the decrease in inflation. Thus we get a lower real rate and higher aggregate demand. But if the interest rate is at the zero lower bound, the central bank cannot reduce the interest rate further. Then, lower wage increases and lower inflation can lead to higher real interest rates and lower aggregate demand and employment.

10. We use the Taylor rule $i = 0.02 + \pi + 0.5(\pi - 0.02) + 0.5\hat{Y}$.

The equation for inflation from Chapter 9 is $\pi = \frac{\Delta W}{W} - \frac{\Delta E}{E}$.

Thus we have $i = 0.01 + 1.5\left(\frac{\Delta W}{W} - \frac{\Delta E}{E}\right) + 0.5\hat{Y}$

The real interest rate is minimized when the nominal interest rate is zero (see Fig. 10.6). Setting *i=0* we get:

$$\frac{\Delta W}{W} = \frac{1}{1.5}\left(-0.01 - 0.5\hat{Y}\right) + \frac{\Delta E}{E} = -0.007 - \frac{1}{3}\hat{Y} + \frac{\Delta E}{E}$$

If productivity growth is 2.7 percent and the output gap is zero, a wage increase equal to 2 percent per year will minimize the real interest rate and maximize job growth. Lower wage growth will raise the real interest rate because the central bank cannot reduce the nominal interest rate further.