ACF 302 - Week 18

Workshop: Working capital management and short-term financing

Berk and DeMarzo Chapters 26 - 27

Outline of the session

- You have lot's of exercises in the exercise sheet to provide for additional practice.
- **During the workshop, we're going through the most important elements of certain numerical questions.**
- **Today: Exercises 2-7,15,16,18,19 (I might consider revising the rest of the exercises at the next workshops).**
- Answers for MCQs are at the end of the slides for you to study independently.
- You can also try the end of chapter exercise in the book if you need more practice (this also applies to Leasing)
- Take a look on Moodle for the additional slides to revise handling rates (APR, compounding, etc.)
- **EVERYTHING FROM WEEK 1 TO WEEK 18 (INCLUDING THIS WORKSHOP and exercise sheet) IS INCLUDED IN THE TERM TEST.**

If you have questions or doubts don't hesitate to send an email or booking a virtual office hour.

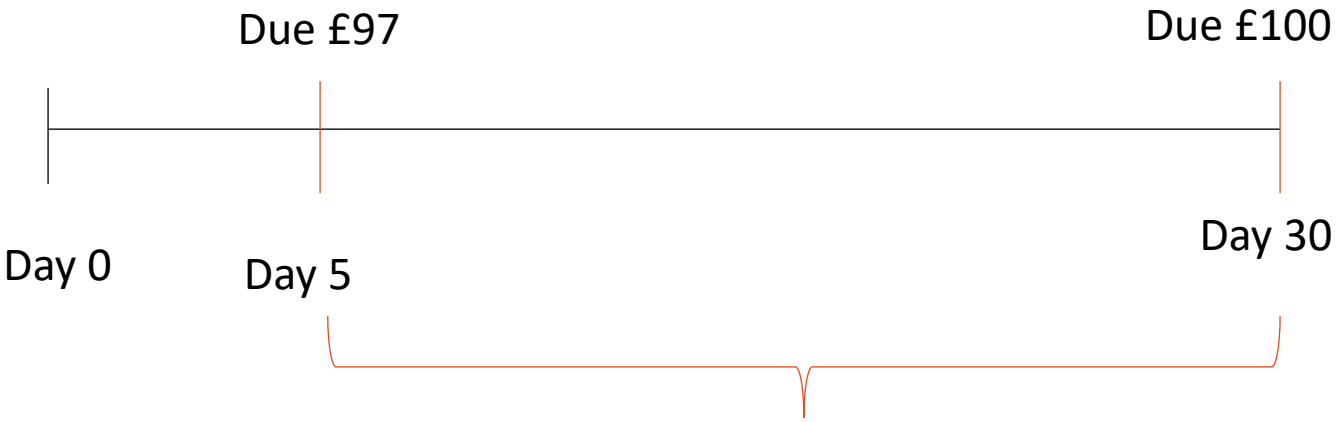
Workshop exercise 2)

Assume the credit terms offered to your firm by your suppliers are 3/5, Net 30. Calculate the cost of the trade credit if your firm does not take the discount and pays on day 30.

(Note that in these type of exercises, the amount of the actual credit is not stated. These exercises are worked on the basis of £100)

Workshop exercise 2)

Assume the credit terms offered to your firm by your suppliers are 3/5, Net 30. Calculate the cost of the trade credit if your firm does not take the discount and pays on day 30.



This is almost as if the real price were £97 and we are charged £3 extra for delaying the payment 25 days

Workshop exercise 2)

- In this instance, the customer will have the use of £97 for an additional 25 days (30 – 5) if he chooses **not** to take the discount. It will cost him £3 to do so since he must pay £100 for the goods if he pays after the 5-day discount period. Thus, the interest rate per period is:

$$\frac{£3}{£97} = 0.0309 = 3.09\%.$$

- The number of 25-day periods in a year is 365/25 = 14.6 periods.
- The effective annual cost of the trade credit is:

EAR = $(1.0309)^{14.6} - 1 = 55.94\%$.

Workshop exercise 3)

- Your supplier offers terms of 1/10, Net 45. What is the effective annual cost of trade credit if you choose to forgo the discount and pay on day 45?

NOT using the discount period!

Workshop exercise 3)

- If you were to pay within the 10-day discount period, you would pay £99 for £100 worth of goods.
- If you wait until day 45, you will owe £100. Thus, you are paying £1 in interest for a 35-day (45 – 10) loan of $99.
- The interest rate per period is:

$$\frac{£1}{£99} = 0.0101 = 1.01\%.$$

- The number of 35-day periods in a year is 365/35 = 10.43 periods. So the effective annual cost of the trade credit is:
- EAR = $(1.0101)^{10.43} - 1 = 11.05\%$.

Workshop Exercise 4)

- Your firm purchases goods from its supplier on terms of 1/10, net 30. Calculate the effective annual cost to your firm if it chooses not to take advantage of the trade discount offered and stretches the accounts payable to 45 days.

The difference in days = 45 - 10 = 35 days.

You will either pay £0.99 on a pound of sales in 10 days or £1.00 on a pound of sales in 30 days.

$$\text{EAR} = \left(\frac{£1.00}{£0.99}\right)^{\frac{365}{35}} - 1 = 0.1105 = 11.05\%$$

Note how I solve this exercise on the basis of £1 of sales and not £100. This should not make a difference on the result.

Workshop exercise 5)

- Simple Simon's Bakery purchases supplies on terms of 1/10, Net 25.
- If Simple Simon's chooses to take the discount offered, it must obtain a bank loan to meet its short-term financing needs.
- A local bank has quoted Simple Simon's owner an interest rate of 12% on borrowed funds.
- Should Simple Simon's enter the loan agreement with the bank and begin taking the discount?

Read carefully this! The Bakery doesn't have any money. The bakery would take the loan and pay within the discount period if and only if the cost of the loan is CHEAPER than the cost of the trade credit.

Workshop exercise 5)

- In this exercise the Bakery needs to **choose the cheapest form of financing** (use the supplier's trade credit or take the bank loan at 12%).

- If Simple Simon's takes the discount, it must pay £99 in 10 days for every £100 of purchases. If it elects not to take the discount, it will owe the full £100 in 25 days.
- The interest rate on the loan is:

$$\frac{£1}{£99} = 1.01\%.$$

- The loan period is 15 days (= 25 – 10). The effective annual cost of the trade credit is:

$$\text{EAR} = (1.0101)^{365/15} - 1 = 27.7\%.$$

- Since the bank loan is only 12%, Simple Simon should borrow the funds from the bank in order to take advantage of the discount.

Workshop Exercise 6)

Your firm purchases goods from its supplier on terms of 3/15, Net 40.

- a. What is the effective annual cost to your firm if it chooses not to take the discount and makes its payment on day 40?

- b. What is the effective annual cost to your firm if it chooses not to take the discount and makes its payment on day 50?

Workshop exercise 6 – a)

- Your firm is paying £3 to borrow £97 for 25 days (= 40 – 15). The interest rate per period is:

$$\frac{£3}{£97} = 0.0309 = 3.09\%.$$

- The effective annual rate is $(1.0309)^{365/25} - 1 = 55.9\%$.

Workshop exercise 6 – b)

- In this case, your firm is **stretching** its accounts payable.
- You are still paying £3 to borrow £97, so the interest rate per period is 3.09%.
- However, the loan period is now 35 days (= 50 – 15).
- The effective annual rate is reduced to 37.4% because your firm has use of the money for a longer period of time:
- EAR = $(1.0309)^{365/35} - 1 = 37.4\%$.

Workshop exercise 15)

Which of the following one-year £1000 bank loans offers the lowest effective annual rate?

A. A loan with an APR of 6%, compounded **monthly**

B. A loan with an APR of 6%, compounded annually, that also has a **compensating balance requirement** of 10% (on which no interest is paid)

C. A loan with an APR of 6%, compounded annually, that has a 1% **loan origination fee**

Note that the amount and the term of the loan is already agreed.
It is set and it's not something you're negotiating.
The alternative terms of the loan will reduce the proceeds of the loan.

Workshop exercise 15)

A) A loan with an APR of 6%, compounded monthly

Since the APR is 6%, the monthly rate is 6%/12 = 0.5%.

This translates to an effective annual rate of

$$(1.005)^{12} - 1 = 6.2\%.$$

Workshop exercise 15)

b) A loan with an APR of 6%, compounded annually, that also has a compensating balance requirement of 10% (on which no interest is paid) .

The compensating balance is £1,000 × 0.10 = £100. Therefore, the borrower **will have use of only £900** of the £1,000.

The interest is 0.06 × £1,000 = £60. (we calculate this over £1000 because that is the amount of money the bank is lending).

Loan = £1000
CB = -£100
CF(0) = £900

Repay the loan = -£1000
Interests on the loan = -£60
CB = 100
CF(1) = -£960

The interest rate per period is £960/£900 - 1 = £60/£900 = 6.7%. (note: we are effectively borrowing/using only £900).

Since this alternative assumes annual compounding, the effective annual rate is 6.7% as well.

Workshop exercise 15)

C) A loan with an APR of 6%, compounded annually, that has a 1% loan origination fee.

The interest expense is 0.06 × £1,000, and the loan origination fee is 0.01 × £1,000 = £10.

The loan origination fee **reduces the usable proceeds** of the loan to £990 because it is paid at the beginning of the loan.

Loan = £1000
Fee = -£10
CF(0) = £990

Repay the loan = -£1000
Interests on the loan = -£60
CF(1) = -£1060

The interest rate per period is £1060/£990 – 1 = 7.07%. Since the loan is compounded annually in this case, 7.07% is the effective annual rate.

Thus, alternative (a) offers the lowest effective annual cost.

Workshop exercise 16)

- The Needy Corporation borrowed £10,000 from Bank Ease.
- According to the terms of the loan, Needy must pay the bank £400 in interest every three months for the three year life of the loan, with the principal to be repaid at the maturity of the loan.
- What effective annual rate is Needy paying?

Workshop exercise 16)

In this problem, Needy must pay £400 every three months to have the use of £10,000.

Thus, the interest rate per period is £400/£10,000 = 4%.

Since there are four three-month periods in a year, 4% is a **quarterly** rate. We need to annualize it as follows:

$$EAR = (1.04)^4 - 1 = 17\%$$

Exercise 7) Choosing between alternative sources of ST funding

ShippingTranscontinental needs a £200,000 loan for the next 30 days. ShippingTranscontinental has three alternatives available.

- Alternative #1: Forgo the discount on its trade credit agreement that offers terms of 2/5 net 35.
- Alternative #2: Borrow the money from Vicovaro, which has offered to lend the firm £200,000 for one month at an APR of 9%. The bank will require a (no-interest) compensating balance of 10% of the face-value of the loan and will charge a £600 loan origination fee, which means that the firm must borrow even more than the £200,000 they need.
- Alternative #3: Borrow the money from Bank Corvobianco, which has offered to lend the firm £200,000 for one month at an APR of 12%. The loan has a 1% origination fee.
- Which alternative should Shipping choose. Explain why.

7 – Alternative 1)

- Alternative #1 -The interest rate per period is £2/£98 = .020408.
- If the firm delays payment until the 35th day, it has use of the funds for 30 days beyond the discount period.
- There are 365/30 = 12.167 30 day periods in one year.
- The effective annual cost is :
- EAR: $(1 + .020408)^{12.167} - 1 = .2786$ or 27.86%

7 – Alt. 2): assuming you can borrow as much as you need from the bank!

Alternative #2 - Shipping must borrow more than the £200,000 they need because of the loan origination fee and compensating balance.

- If you need to borrow more, then the amount that you will need to borrow is equal to
- Total Borrowing (TB) = Financial need (FN) + Fee + Compensating Balance(CB)
- TB = £200000 + £600 + 0.1 x TB
- 0.9TB = £200600
- TB = £222888.9 → this will be split £600 for fees, £200,000 to cover my ST financial needs and £22,288.89 goes to the compensating balance

- The amount that will need to be repaid (with interest) is equal to:
- £ 222,888.9 *(1 + 0.09/12) = £224,560.6
- But £ 22,288.89 of the total amount repaid in CF(1) will come from the compensating balance.
- Then, the actual monthly interest rate paid is : (£224,560.6 - £22,288.89)/£200,000- 1 = 1.1358%

- Thus, the effective annual cost is EAR = $(1 + 0.0113)^{12} - 1 = 14.51\%$

This is the precise and correct way to approximate the total amount to be borrowed.

7 – Alt 3) Assuming you can borrow as much as you need from the bank.

- Alternative #3 - must borrow more than the £200,000 they need because of the loan origination fee (1% of total amount borrowed).
- Total borrowing = £200,000 + 0.01*TB
- TB -0.01TB = £200,000
- TB = £200,000/0.99 =£202,020.2

- The amount that will need to be repaid (with interest) is equal to £202,020.2(1 + 12%/12) = £204,040.4
- The actual monthly interest rate paid is £ 204,040.4 /£200,000 - 1 = .020202 or 2.02%.
- Thus, the effective annual cost is $(1 + 2.02)^{12} - 1 = .2713$ or 27.13%

Exercise 7)

- Your advise should be to choose the alternative with the lowest EAR.
- In this case it would be alternative #2

Is assuming we can borrow as much as we want for each source realistic?

- You could assume you can borrow as much as you need at a given pre-established rate if you were dealing with a **credit line and** we need funds quite below the credit limit.

- However, if we are dealing with a short term loan the terms of the credit might change according to the amount of money we need to borrow, and assuming the terms of the credit stay the same even if we need to borrow more is not always realistic.

- If we are dealing with a very specific financial need (a clear stated shortfall of money we need to cover), and the bank is offering loans of very specific amounts that after considering fees and compensatory balances are insufficient to cover for our shortfall, then we might be forced to **combine sources of funding**.

Combining sources of funding

If we interpreted this exercise as if you could borrow no more than £200,000 from either bank, then your solution should involve:

i) Calculate the EAR for all options

ii) Borrowing as much as possible from the cheapest bank.

iii) Calculating the usable proceeds of the loan.

iv) Calculate the difference between your financial needs and the usable proceeds of the loan.

v) Borrow the rest of the money needed using the trade credit agreement (assuming this can be done for a flexible amount).

Let's pretend you need £500,000

- If the exercise stated that you could borrow "up to 1 million" from option A and "up to" 400,000 from option B.
- This doesn't mean you discard option B because is not enough money to cover your shortfall.
- If option B is the cheapest solution, then you should "combine" the sources of financing, borrowing as much as you can from option B and the rest from option A.

18) Consider the following three companies and their short term financing arrangements.

a. Kinston Industries has an average accounts payable balance of £220,000. Its annual cost of goods sold is £5,475,000, and it receives terms of 2/10, net 30 from its suppliers. Kinston chooses to forgo this discount. Is Kinston managing its accounts payables well?

b. Manchester Copper has borrowed £5 million for six months at a stated annual rate of 10%, using inventory stored in a field warehouse as collateral. The warehouse charges a £25,000 fee, payable at the end of the six months. Calculate the effect annual rate on this loan.

c. Lancaster mining is offered a £1 million pound loan for four months at an APR of 9%. If this loan has an origination fee of 1%. Calculate the effective annual rate (EAR) for this loan .

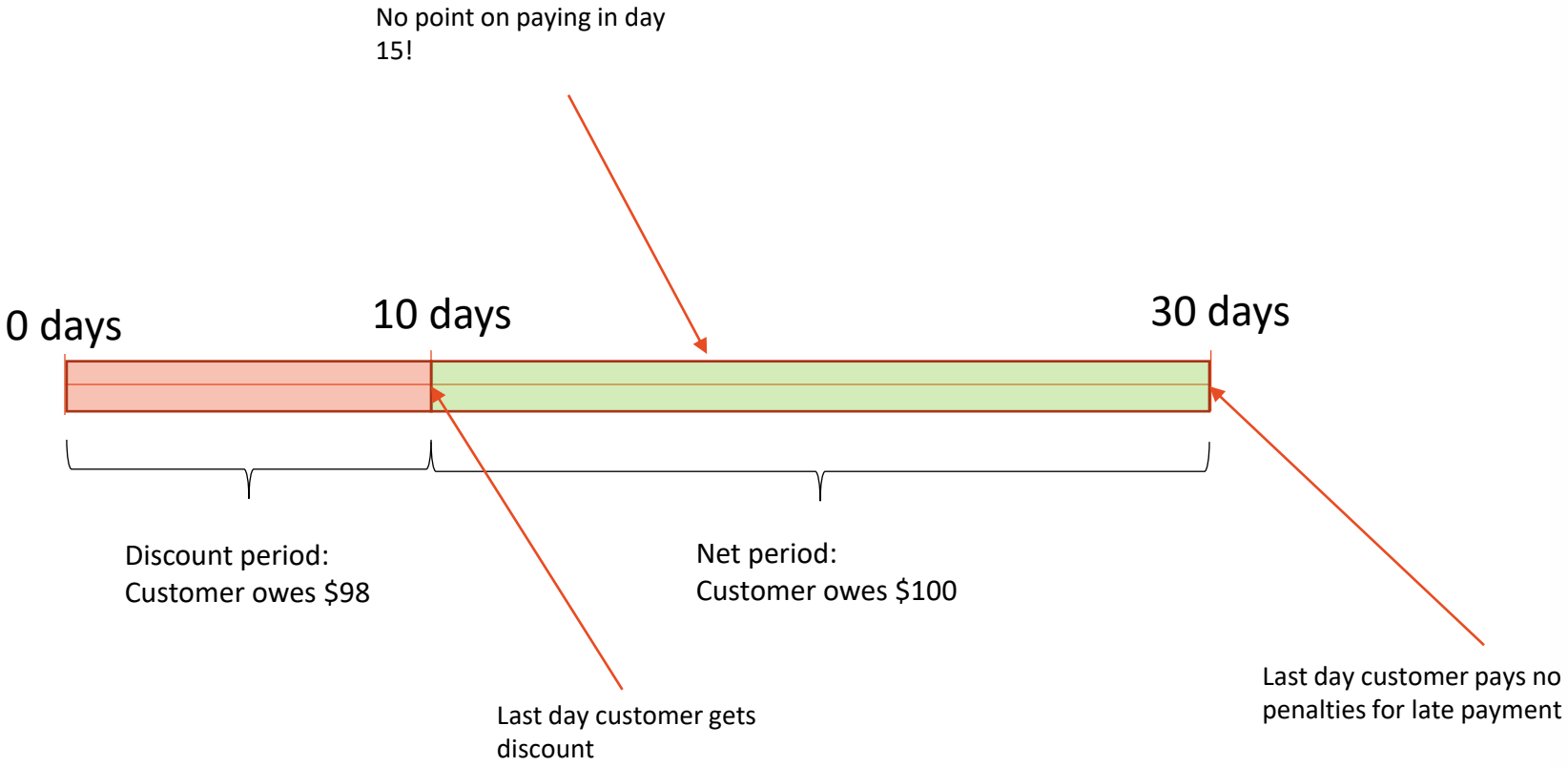
d. Which company has the best arrangement?

18)Consider the following three companies and their short term financing arrangements.

Kinston Industries has an average accounts payable balance of £220,000. Its annual cost of goods sold is £5,475,000, and it receives terms of 2/10, net 30 from its suppliers. Kinston chooses to forgo this discount.

- Kinston's days payable outstanding is £220,000 /(£5,475,000 /365) = 14.67 days. This means that Kinston paid its invoices in around 15 days after receiving the bills.
- If Kinston made the payments less than 10 days earlier, they could take a 2% discount.
- If, for some reason, they choose to forgo the discount, then they should not be paying the full amount until 30 days.
- The firm is not managing its accounts payables well.

Always draw a timeline!



18) Consider the following three companies and their short term financing arrangements.

- Manchester Copper has borrowed £5 million for six months at a stated annual rate of 10%, using inventory stored in a field warehouse as collateral. The warehouse charges a £25,000 fee, **payable at the END of the six months**. Calculate the effective annual rate on this loan.

- The semiannual interest rate is 10%/2 = 5%.

- At the end of the six months Manchester Copper will owe £5 million × 1.05 = 5,250,000 plus the warehouse fee of £25,000 for a total of £5,275,000.

- The actual semiannual interest rate paid is £5,275,000 / £5,000,000 - 1 = 0.055 or 5.5%, expressing this as an EAR gives us $(1 + .055)^2 - 1 = 0.113025$ or 11.3025%

18) Consider the following three companies and their short term financing arrangements.

Lancaster Mining is offered a £1 million pound loan for four months at an APR of 9%. If this **loan has an origination fee of 1% (this needs to be repaid upfront!).** Calculate the effective annual rate (EAR) for this loan .

- The origination fee is charged on the principal of the loan.
- The amount of the fee is equal to .01 × £1,000,000 = £10,000
- The actual proceeds from the loan = £1,000,000 - £10,000 = £990,000. (note how here I'm not borrowing more, I'm just reducing the proceeds of the loan by the fee amount)
- The interest on the loan equals £1,000,000 × 0.09/12 × 4 months = £30,000
- The actual four month interest rate is: £1,030,000 / £990,000 - 1 = .040404 or 4.04%
- Expressing this rate as an EAR gives $(1.040404)^3$- 1 = .126176 or 12.62%

d) Which company has the best arrangement: Manchester Copper or Lancaster Mining ?

- the one with the lowest financing cost (Manchester Copper)

19) SuperTires is considering several options to cover for their short-term financial needs using *secured financing*.

Calculate the effective annual rate for the offers in (i) and (ii) :

(i) Borrow £4 million for three months at a stated annual rate of 8%, using inventory stored in a field warehouse as collateral. The warehouse charges **a quarterly fee** of £10,000.

(ii) SuperTires is considering using a public warehouse loan as part of its short-term financing. The firm is **offered** a loan of £2 million for three months. Interest on the loan will be 12% (APR, compounded quarterly) to be paid at the end of the quarter. The warehouse charges 1% of the cash needs of the firm, payable at the **beginning** of the quarter.

19-i) Field Warehouse

- The quarterly interest rate is 8%/4 = 2%.
- At the end of the quarter SuperTires will owe £4 million × 1.02 = 4,080,000 plus the warehouse fee of £10,000 for a total of £4,090,000.

- The actual quarterly interest rate paid is £4,090,000/4000000 - 1 = 0.0225 or 2.25%
- expressing this as an EAR = $(1 + .0225)^4 - 1 = 0.093083$ or 9.30835%

19 - ii) Public Warehouse

- The quarterly interest rate is 12%/4 = 3%.
- The firm is offered a £2 million loan from the lender.
- The Public warehouse charges 1% of the amount of the financial needs to be paid **upfront**.
- Cash flows look like:

Loan = £2,000,000
Fees = -£20,000
CF(0) = £1,980,000

Repay the loan = £2,000,000
Interests on the loan = £60000
CF(1) = £2,060,000

- Interest for the period = £2,060,000/£1,980,000 -1 = .0404 = 4.04%
- EAR = $(1.04)^4$ -1 = 17.16%
- WARNING! Note that I have changed the word "required" from the exercise and instead I have used the phrase "The firm is offered a loan for £2M".
- In this solution we are assuming that the firm "can" settle for a situation where the usable proceeds of the loan are LESS than £2,000,000. (actually being able to use £1,980,000).

Iii) Considering the alternatives above, which one would you advise SuperTires to take? Explain why.

Field warehouse offers cheaper finacing.

Iv) Can you suggest to SuperTires two alternative forms of secured financing that don't involve using inventories as a collateral?

Factoring Accounts receivables.

Pledging account receivables as collateral

Pledging other assets (i.e. physical assets) as collateral.

1) The term 5/10 net 30 means:

A. If the invoice is paid within 10 days a 5% discount can be taken. If the invoice is paid between 11 and 29 days a 1% discount can be taken. After 30 days the full invoice is due.

B. If the invoice is paid within 5 days a 10% discount can be taken, otherwise the full invoice is due in 30 days.

C. If the invoice is paid within 2 days a 10% discount can be taken, otherwise a 2% discount can be taken if the invoice is paid in 30 days.

D. If the invoice is paid within 10 days a 5% discount can be taken, otherwise the full invoice is due in 30 days.

Answer: D

8) Which of the following statements is FALSE?

- A) A firm should always pay on the latest day allowed.
- B) The lower the discount percentage offered, the greater the cost of forgoing the discount and using trade credit.
- C) A firm should choose to borrow using accounts payable only if trade credit is the cheapest source of funding.
- D) A firm should strive to keep its money working for it as long as possible without developing a bad relationship with its suppliers or engaging in unethical practices.

Answer: B. If the discount is low, then the cost of forgoing the discount is low.

Exercise 9

Occasionally, a company will encounter circumstances in which cash flows are temporarily negative for an unexpected reason. We refer to such a situation as:

a) a liquidity shock.

b) a negative cash flow shock.

c) a negative liquidity shock.

d) a cash crunch.

Answer: B

10) Which of the following statements is FALSE?

A. Firms with seasonal cash flows may find themselves with a surplus of cash during some months that is sufficient to compensate for a shortfall during other months. However, because of timing differences, such firms often have short-term financing needs.

B. A company forecasts its cash flows to determine whether it will have surplus cash or a cash deficit for each period.

C. Like seasonalities, positive cash flow shocks can create short-term financing needs.

D. When sales are concentrated during a few months, sources and uses of cash are also likely to be seasonal.

Answer: C. Positive cash flow shocks do not create short term financing needs but excess of cash that needs to be reinvested.

11) Which of the following statements is FALSE?

A. If a company anticipates an ongoing surplus of cash, it may choose to increase its dividend payout.

B. Seasonal sales can create large short-term cash flow deficits and surpluses.

C. The first step in short-term financial planning is to forecast the company's future net working capital.

D. Deficits resulting from investments in long-term projects are often financed using long-term sources of capital, such as equity or long-term bonds.

Answer: C. The first step in short-term financial planning is to forecast the company's future cash flows.

12) A written, legally binding agreement that obliges the bank to lend a firm any amount up to a stated maximum, regardless of the financial condition of the firm (unless the firm is bankrupt) as long as the firm satisfies any restrictions in the agreement is called:

A. a bridge loan.

B. a single, end-of-period-payment loan.

C. a short-term mortgage loan.

D. a committed line of credit.

Answer: D

13) Which of the following statements is FALSE?

A. The matching principle indicates that the firm should finance permanent working capital with short-term sources of funds.

B. Following the matching principle should, in the long run, help minimize a firm's transaction costs.

C. In a perfect capital market, the choice of financing is irrelevant; thus, how the firm chooses to finance its short-term cash needs cannot affect value.

D. A portion of a firm's investment in its accounts receivable and inventory is temporary and results from seasonal fluctuations in the firm's business or unanticipated shocks.

Answer: A. The matching principle indicates that the firm should finance permanent working capital with long-term sources of funds.

(Remember from the lecture)27.2 The Matching Principle

- Matching Principle
  - States that a firm's short-term needs should be financed with short-term debt and long-term needs should be financed with long-term sources of funds

14) Which of the following statements is FALSE?

A. Because investment in permanent working capital is required so long as the firm remains in business, it constitutes a long-term investment.

B. Because temporary working capital represents a short-term need, the firm should finance this portion of its investment with short-term financing.

C. Temporary working capital is the difference between the lowest level of investment in short-term assets and the permanent working capital investment.

D. The matching principle states that short-term needs should be financed with short-term debt and long-term needs should be financed with long-term sources of funds.

Answer: C. Temporary working capital is the difference between the actual level of investment in short-term assets and the permanent working capital investment.

17) Which of the following is NOT a specific financing option for temporary working capital?

A) Treasury bills

B) Secured financing

C) Bank loans

D) Commercial paper

Answer A

20) Which of the following statements is FALSE?

A. If a factoring arrangement is with recourse, the factor will pay the firm the amount due regardless of whether the factor receives payment from the firm's customers.

B. In a factoring of accounts receivable arrangement, the firm sells receivables to the lender (i.e., the factor), and the lender agrees to pay the firm the amount due from its customers at the end of the firm's payment period.

C. Businesses can also obtain short-term financing by using secured loans, which are loans collateralized with short-term assets—most typically the firm's accounts receivables or inventory.

D. Both the interest rate and the factor's fee vary depending on such issues as the size of the borrowing firm and the dollar volume of its receivables.

A) If a factoring arrangement is without recourse, the factor will pay the firm the amount due regardless of whether the factor receives payment from the firm's customers.

21) Which of the following statements is FALSE?

A. A public warehouse is a business that exists for the sole purpose of storing and tracking the inflow and outflow of the inventory.

B. A warehouse arrangement is the riskiest collateral arrangement from the standpoint of the lender.

C. Because the warehouser is a professional at inventory control, there is likely to be little loss due to damaged goods or theft, which in turn lowers insurance costs.

D. A field warehouse is operated by a third party, but is set up on the borrower's premises in a separate area so that the inventory collateralizing the loan is kept apart from the borrower's main plant.

- Answer: B) A warehouse arrangement is the least risky collateral arrangement from the standpoint of the lender.