

LEARN BASIC  
FINANCE  
AND  
INVEST  
FOR PROFIT

CH THAY

## Contents

ANYTHING & EVERYTHING

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Having worked at multinational companies such as Bristol-Myers Squibb, Kerry Beverages and Coca-Cola for the past two decades, Thay has extensive knowledge and experience in operations management, financial management, capital investment, investment appraisal and corporate finance.

During his fifteen years in Mainland China, Thay has watched China transformed from a nation of acute poverty in the early nineties to today's economic powerhouse. He has also bear witness to the many financial crises of our age. Thay wants to share with readers his knowledge, experience and findings acquired during the years, and express his views on investing for profit.

## PREFACE

How does basic finance help investors and business managers? Finance is a complex subject. In order to comprehend every aspect, it requires many years of studies and practice in school and professional facilities. In addition, there is a chance that knowledge learned academically cannot be used effectively in real life due to environmental differences, irrelevance and theoretical mismatch.

For non-finance executives and general investors, it is essential that they acquire sufficient financial knowledge to understand business operations, financial performance and investment evaluations. This book focuses mainly on topics that enable readers to master basic finance in the shortest time possible and apply the knowledge intelligently.

All topics have been specifically chosen to include areas of the greatest practicality in business and private investment. This book will be a useful reference for non-finance people in their everyday business management, with adequate explanation on selected subjects, relevant examples, exercises and guiding notes.

This book is divided into two sections to suit different readers. The first section largely describes finance basics, financial markets, cost of exchange, financial statements, ratio analysis and investment appraisal methodologies. The second section provides an in-depth analysis of various types of investments, with a special focus on making profit from stock investment by following the rules of the game.

With this book, readers can better understand the risks in investment and apply the appropriate techniques in assessing their investments. It is my hope that you will gain insight into minimizing and avoiding unnecessary risks and make attractive profits from the stock market. Being a long time investor, I have succeeded. I am sure that you too can make it happen.

CH THAY  
FCMA (UK), MBA (UK)

**PART ONE**  
**LEARN BASIC FINANCE**

# CHAPTER 1

## FINANCE BASICS

### A. Exchange between Now and Future

Since the ancestral days of barter trade, we have learned about the exchange of resources. When money was created as a legal tender, the process has become faster and more convenient.

Finance refers to the economics of shifting resources over time. Resources can include cash, real assets, stocks, properties and whatever you possess. For example, cash can be used to enjoy immediate benefits, saved or invested. Different people have different wants and needs, putting the shifting of resources in motion.

Our satisfaction from spending can vary with time. Some people want to spend now, while others prefer later. Finance allows different people to enjoy both. Satisfaction would increase when cash is exchanged for something valuable, taken that you have surplus at hand or liquid assets ready for conversion. For example, if you want to buy a hi-fi that is worth \$3000, you can only do it if you have enough cash or assets that can be converted to cash. If not, you would have to borrow to fulfill your need. Similarly, this applies to the purchase of a house or automobile.

Through borrowing, you are able to shift some of your future resources to the present to fulfill your desire. As for the lender, he gives up some of his current resources in exchange for the interest you are expected to pay in addition to the principal. Such shifts in resources are the essence of finance, and occur everyday in individuals, governments, corporations and other institutions.

Aside from borrowing and lending, there are also other activities that involve the reallocation of resources. When we do not have enough money, we borrow; when companies run short of capital, they borrow or issue shares; when governments need to raise funds, they issue bonds and securities. When a company raises capital through issuing shares, it is undertaking a financial transaction that is similar to an individual borrowing.

With the shifting of resources, there are millions and billions of dollars in trading and financial transactions passing through everyday in different markets. Under-

standing the financial characteristics of these activities is an important part of being educated in business and enabling you to make better decisions.

It is believed that non-finance executives will become better managers if they understand basic finance and the implications of financial indicators. For anyone in private investment or running a business, he should become familiar with measuring profitability and earning satisfactory return on capital invested when comparing investment options. Comparison is only made possible by applying all measurable yardsticks. A good financial evaluation and sound judgment are necessary in deciding the satisfactory return and ratio.

# CHAPTER 2

## FINANCIAL MARKETS

### A. Different Types of Financial Markets

How much do you know about the stock market? It is a place to buy and sell stocks. The financial market is where buyers and sellers gather to participate and trade in all sorts of financial products or instruments. It can be done through a bank, stock exchange, brokerage house, money changers or other financial institutions. Financial products include simple securities such as stocks, warrants, puts and bonds, currency and commodity trading (agricultural products and precious stones etc.), and more complex and sophisticated instruments such as forwards, futures and derivatives contracts.

In barter trade, we exchange merchandises; and in a financial market, we exchange things that are measurable and can have a value attached. Because of its complexity and variety, financial markets are further sub-divided.

**Money Markets** - deal in short-term investments, borrowing and lending, usually taken to be less than a year. Examples include deposit certificates, banker acceptances, IOUs (I owe you), treasury bills, commercial notes and papers (the last three are popular in the United States).

**Capital Markets** - cater to long-term funding requirements and cover both stocks and bonds. The primary market deals with new issues such as IPO (initial public offer), and the secondary enables new and existing securities to be traded between buyers and sellers. All trading transactions are done through the stock exchange of individual countries such as Hong Kong Stock Exchange (HKSE) and New York Stock Exchange (NYSE) in the United States.

**Commodity Markets** - cater to commodity trading, which includes crude oil, agricultural products (e.g. rubber, palm oil, sugar, corn, rice), precious metals (e.g. gold, silver, platinum) and other industrial products (copper, zinc, aluminum, tin etc.). Buying and selling are usually in the form of forward contracts and futures and do not necessarily involve the actual transfer of physical goods.

**Insurance Markets** - cater to the redistribution of various risks which include life

assurance and different types of general insurance.

**Foreign Exchange Markets** - facilitate the buying and selling of foreign currencies, using spot or forward rates. It is one of the busiest financial markets used by individuals and corporations when dealing in international trade.

**Derivatives Markets** - cater to the hedging and managing of financial risks and have grown in popularity over the past few years due to the rapidly changing financial innovativeness and business requirements. Underlying assets are usually attached to such contracts and can include any products from the other markets mentioned above.

**Futures Markets** - refer to forward contracts signed for trading products at a future date. Any contract signed with the obligation to be discharged sometime in the future falls under this category and covers any trading contracts signed in other markets.

### B. Market Players and the Economy

Who are the market players? They can be part of a group, company, government or financial intermediaries such as banks, finance companies, insurance companies, pension and mutual funds, private equities and hedge funds.

Why do we use or need financial markets? The reason is simple. We have extra resources to spare and others want them. This is only made possible through a financial market, a place for exchange. A financial market provides a facility where you can lend or borrow money, making transactions and exchanges to satisfy your present needs or future wants.

Financial markets bridge the gap between those in need of resources now and those willing to give up theirs for additional returns in the future. Both parties would expect to receive a satisfactory return in the exchange process. Without financial markets, those wanting to invest would find it difficult or impossible to get the necessary capital.

Similarly, insurance premiums, contributions to pension funds and unit trusts are reinvested on the investor's behalf in order to gain attractive interests or protection. In this respect, additional funds are injected into financial markets for the immediate needs of others.

People tend to participate more actively in a developed economy due to prosperity and richness in resources. If we need money, we seek assistance from banks. When we have excess cash, we “lend” it to banks or other financial institutions to earn interests. In turn, banks re-lend to others in need of cash and charge a higher interest. The money supply in a developed and mature capital market is more freely available than an underdeveloped one.

If we want to invest in real assets or the share market, our capital would come from our own pockets or through borrowing. In the case of business ventures or properties, some might turn to mortgaging, providing collaterals in exchange for the necessary cash. This is a step further into the financial market which involve commitments and obligations.

For corporations, they also transact with banks for their needs. They raise capital by having bankers underwrite shares, borrowing substantially to run or expand their business. More established corporations will issue preference shares or bonds to raise capital. They will also utilize financial markets, acting through intermediaries such as investment bankers, insurance companies and pension funds. These intermediaries will raise money from other companies and individuals, collect premiums and contributions and lend it to those in need for higher returns or paybacks.

Governments also play an active role in financial markets. Apart from the usual borrowing and lending activities among individuals, corporations and financial institutions, governments regulate the market by embarking fiscal and monetary policies on interest rates, government expenditures and taxes to balance national economy. When a country runs short of funds, international financial markets will come to the rescue, providing inter-government borrowings and bonds.

Without these activities and transactions, financial markets will become quiet or stagnant. If there is an increase in the exchange of resources, markets will become more active and help the growth and expansion of the overall economy. This will eventually lead to an upswing in expenditures, consumptions, demands, supplies, and overall country GDP (gross domestic products).

In the past decade, China has grown from an underdeveloped country to an economic powerhouse. It has been a great leap forward since China adopted the Open Door Policy to attract foreign investment. On the other hand, today’s North Korea resembles the old China, still very much underdeveloped. This is a good example of an open and closed market.

However, when a market is hit hard, it would take many years of economic adjustment to recover, as everything has to start all over again from the bottom. Everything is cheap, GDP growth turns negative, unemployment steps in and companies underperform or even go bust.

What we are currently experiencing globally is perhaps one of the most devastating and damaging crises in history. Governments around the globe are now joining hands and spending billions of dollars in rescue plans to stimulate global economy. Let us see how much had been injected into the financial systems:

United States: US\$700b	Ireland: US\$ 564.82b
Germany: US\$651b	Malaysia: US\$2b
United Kingdom: US\$ 634.23b	Hong Kong: HK\$100b
France: US\$573.3b	

### C. The Cs: Credit Crisis and Credit Crunch

What does it mean when someone is in deep financial trouble? It means the person is in acute shortage of liquidity to fulfill his obligations, meaning critically running short of cash to service his debts. Over commitment is very common. With the convenience and plentiful supply of credit cards, many choose to spend first and pay later. The lack of basic financial knowledge and planning could lead to financial turmoil and Chapter 11 (US Bankruptcy Code).

We have heard a lot about credit crisis in the press and media since the day of the financial tsunami. What is a credit crisis? How does it occur? It occurs when the entire financial market and economy are handicapped by credit issues. It all begins when high risk loans issued or purchased by financial institutions begin to default. When borrowers default, lenders receive no money. This will start a chain reaction that affects the entire market.

Banks or investors will become wary of their lending and impose higher costs on borrowers. To prevent risks and potential losses, stricter measures are installed to allow credits to include reassessment of risk position of existing borrowers, resulting in the escalation of interests and recalling of riskier loans. Funds become more costly, debtors begin to delay or default payments and creditors cannot reclaim their money in time.

Many organizations will subsequently decide to downsize, freeze capital and lay off employees in order to survive. Companies hit hard by credit crunch (difficulty in obtaining loans to service debt obligations) will turn insolvent and seek protection under Chapter 11. A credit crunch makes it almost impossible for companies to borrow because banks or lenders are scared of further defaults.

The current credit crisis started in the United States when many large financial institutions were troubled by the large-scale defaults in sub-prime housing loans and mortgages, suffering billions in losses in uncollected debts. Many of the top-notched financial institutions were forced to close or put under receivership, while some lucky ones were rescued and nationalized.

According to China Economic Weekly, as of January 2009, the grim economic conditions have forced more than 670 thousand small companies out of business, with more than six million people jobless. In the United States, other than the financial casualties of defaulting sub-prime loans, the impact from the collapse of the automobile industry is equally devastating. The big three, General Motor, Ford and Chrysler would have laid off more than a million people, including those from auxiliary industries, if the state government had not come to the rescue.

Other constituents of the emerging markets, namely Brazil, Russia and India of BRIC, suffered a similar fate. The spiral of diseconomies rocked and pressured the bottom line of companies, causing the emerging markets to an economic standstill and gradual decline, with some having a negative GDP. Tumbling demands, redundant labour and escalating overhead have also forced out thousands of companies around the world hit by credit crunch.

Governments around the globe are trying to revive the financial system with massive bailouts and rescue packages. According to Moody's economy.com, fifty-one countries have announced rescue plans totaling US\$5 trillion. Companies are put to the greatest test of the century to sustain orders, control costs, and undoubtedly, only the fittest would survive and come out stronger. In Hong Kong, the monetary authority began to pump liquidity into the banking system after the collapse of Lehman Brothers in September 2008. It was followed by an announcement in October to extend 100% deposit protection for two years and provide more capital to local lenders. The government subsequently unveiled a HK\$100 billion loan guarantee to businesses in an attempt to increase job creation.

## CHAPTER 3

# COST OF EXCHANGE

### A. Introduction to Charges and Borrowing Rates

Lending and borrowing are the most important elements in resource exchange. Terms such as cost of funds, cost of money or capital are synonymous, meaning the interest paid or received in borrowing and lending respectively. Interest is the amount of principal paid by a lender to a borrower, expressed in percentage and on annual basis.

There is a cost attached to every transaction that passes through a financing house. These costs are usually called finance or bank charges, commission, transaction fee or interest. They are payments for services provided for handling and performing transactions to the satisfaction of both parties. Banks and financial institutions stand as middlemen in the exchange process between lenders and borrowers.

Banks are obliged to ensure there is no interruption in money flow and are abide by rulings of the central bank. For example, you must have sufficient cash in your account before issuing a cheque. Your bounced cheques, if any, will affect the recipient who could be using the fund to make another payment. This is interruption in the money flow. In Malaysia, you will be charged one hundred dollars for a bounced cheque; and with three bounced cheques, the bank will close your account permanently. There are similar rules being enforced in other countries to regulate such practices to ensure a smooth monetary supply.

When you deposit your money into a savings account, you are paid a nominal interest called savings account interest. For long term fixed deposits, you are rewarded better rates, depending on the period and amount. For currency exchange trading, banks sell high and buy low. The difference is the commission or profit we pay to banks. Banks would take the exchanged currency you had just lodged and re-trade it.

Central bank rate is the rate at which central bank lends funds to all commercial banks. The central bank will adjust the rate to increase or decrease the supply of money, according to changes in the economic situation of the country. Downward adjustment attempts to make borrowings more attractive, thus increasing the mon-

ey supply to the economy. Upward adjustment has the reverse effect.

Base lending rate (BLR) can be defined as the minimum rate calculated by financial institutions, which takes into account the cost of funds and other administration and incidental expenses. BLR is also used as the basis to calculate the offering rate charged to clients. Such rates are usually very close amongst banks, if not the same, to maintain competitiveness.

Inter-bank rate is the rate at which a bank can borrow funds from other banks. Banks are required to reserve adequate cash (sometimes called liquidity ratio) to meet any sudden or potential withdrawals from clients. Just like individuals and corporations, banks might need to borrow in order to manage such liquidity and meet unforeseen requirements.

The rate charged, however, depends mainly on demand and supply, prevailing rates quoted, and terms of the contract and borrowing period. Though it varies in different countries, the operating principles remain largely the same. In London, it is called LIBOR (London inter-bank offer rate), SIBOR in Singapore, and HIBOR in Hong Kong.

When you approach a bank to borrow, it can come in the form of fixed term loan, revolving fund or overdraft facilities. The bank will do a rating and assessment before granting you the loan. Cost of funds to banks is the inter-bank borrowing rate, which denotes the rate charged by banks and is usually calculated at basis points above BLR. When there is a revision in BLR, banks will notify their clients. This is common in many loan and property mortgaged agreements.

## B. Different Types of Interest Rates

Having understood the above, we can now move on to the different types of interests commonly used in financial and commercial markets. Though all are called interests, we need to further understand the many ways they can be calculated and are charged by banks and moneylenders. We have all come across terms such as variable, fixed, simple or compound interest rates. A brief definition of each will be given below with examples.

### i. Simple

It is an agreed rate to be charged in a borrowing transaction. It is only imposed on the principal or outstanding amount. For example, if you borrow \$5,000 and

the interest rate is 5% per annum, then the interest will be \$250 a year, \$20.83 a month or \$0.68 a day. Similarly, when your money is in fixed deposit, you are paid a simple interest for the agreed period. The interest payable is calculated by the time period elapsed.

$$I = p \times r \times t, \text{ where } I \text{ stands for interest, } p \text{ for principal or outstanding amount and } t \text{ for time periods}$$

**Example:** A credit card holder has \$2000 due and has not paid for two months. With an interest rate of 12% per annum, the interest will be  $2000 \times 12\% \times 2/12 = \$40$ . If the unpaid period is 61 days, we can calculate the interest by changing both the numerator and denominator to days,  $2000 \times 61/365 \times 12\% = \$40$ .

Hire purchase and lease contracts commonly use simple interest. The interest is calculated and accrued for the entire contract period to determine the monthly installment for the principal and interest.

**Exercise:** You purchased a car for \$30,000, with a down payment of \$5,000. The remaining balance, arranged through a hire purchase agreement, will be paid over three years at an interest of 5%. Work out the total interest payable and monthly installment repayable amount.

**Answer:** Total interest payable for three years is  $(30,000 - 5,000) \times 5\% \times 3 = \$3,750$  and monthly installment is  $(3750 + 25000)/36 = \$798.61$ . In most agreements, the figures will be rounded up to the next decimal point, so it will be \$798.61 for 35 months and \$798.65 for the last installment.

### ii. Compound

Interest gets bigger over time due to compounding. Compounding simply means interest on previous interest if it remains unpaid when it is due. Similarly, when your fixed deposit matures, you top up the principal with the interest earned which will increase your principal and gains. The method below can help you find out the compounded return on investment.

**Step 1:** Calculate the discount factor for the years to be compounded

**Example:** Two years compounded at 10% is  $(1+0.1) \times (1+0.1) = 1.21$  and three years is  $1.21 \times (1+0.1) = 1.331$

**Step 2: Multiply the factor from Step 1 by the amount invested, you will get principal + interest amount**

**Example:** Invest \$10,000 for two years at a compound interest of 10% is  $10,000 \times 1.121 = \$12,100$ , three years is  $10,000 \times 1.331 = \$13,310$  and so on. You can calculate the interest by simply subtracting the principal \$10,000.

Many investment books would combine the two steps into one formula.

$$I = P \times ((1+r)^n - 1), \text{ where } I \text{ stands for compound interest, } p \text{ for principal or outstanding amount and } n \text{ for power of time period}$$

**Example:** You deposited \$10,000 into a fixed deposit account for a year and requested the bank to roll over the principal with interest upon maturity until further notice. How much interest will you get if you terminate your FD by the end of the second or third year if you are paid 12% per annum? You will get,  $10000 \times ((1+0.12) \times (1+0.12) - 1) = 10000 \times 0.2544 = \$2544$  at the end of year two, and  $10000 \times ((1+0.12) \times (1+0.12) \times (1+0.12) - 1) = \$4049$  at the end of year three.

To make it easier to compute the compound interest at different rates and for varying investment amounts, you can set up a spreadsheet with the compounding factors. Tables with the annual rates are provided in Appendix 1.

### iii. Fixed and Floating

Fixed interest rate is constant and will not change during the contract period, while floating is the opposite and subjected to change when there is revision in reference rates such as BLR, HIBOR or LIBOR. Commercial loans generally use simple interest, while a few apply floating or variable rates. Most housing loans in Malaysia and Hong Kong have a floating rate tied to BLR and certain basis points. The combination of fixed and floating rates is also possible and frequently used.

In a rapidly changing economy, even banks are getting more competitive. Aside from offering attractive rates to increase deposits, many banks offer mortgaged loan facilities at very competitive terms, with fixed and low interest rate for the first few years and the rest at floating rates. Make sure that you compare rates before committing to any new loan facilities.

### iv. Penalty

It is common for a contract to include a penalty clause, which clearly states that a special interest will be charged in the event of default payment. It is usually levied at a few times higher than the normal rate. For example, default in credit card payment could have a penalty interest of at least 2% to 3% interest per month or 24% to 36% per annum.

In more serious defaulting cases, it could lead to the seizure of assets or court action after a borrower has failed to make good his obligations. An advice to investors, be sure that you fully understand the terms and penalties of any legally binding contract before signing. If not, you might end up paying more interests or charges than the rates or terms offered at the outset.

### v. Spot, Forward and Yield (also known as IRR in investment analysis)

Interests that begin in the present and accumulate to maturity are called spot rates. In a financial market, the set of spot rates is called the term structure of interest rates. These rates can be easily obtained from banks or any financial institutions. Rates will be displayed at these places, including information such as the term structure of fixed deposits for three months up to one year, and so on.

Once you have understood the concept of spot rates, it is not difficult to comprehend forward rate. Forward interests can be described as the set of interests that shows the expected yield at a particular time in the future. Without spot rates, you can never calculate forward rates. The example below will help you understand how forward interests are derived and actually work.

#### Example: Spot and Forward Rate

A bank has the spot rates of 5% and 8% for one and two years respectively, with a minimum deposit of \$1,000. Using this as a guide, you can now see how spot and forward rate operate if we assume the \$1,000 is invested for two years.

When we say yield to maturity, it means the spot rate for two years, which is 8%. The value at the end of year two equals  $1,000 \times (1.08 \times 1.08) = \$1,166$ . The forward rate is 11%, which is derived from the value at year two over the value in year one =  $1,166 / (1,000 \times (1 + 5\%))$ . Check:  $1,000 \times 1.05\% \times 1.11\% = \$1,166$ .

**Table 1: Spot and Forward Rates**

Amount Invested: \$1000	Year	Spot Rate	Factor *	Terminal Value	Forward Rate (a)	Calculation for (a)
Period	3	10%	1.331	1331	14%	1260/1124
Period	2	8%	1.166	1166	11%	1124/1050
Period	1	5%	1.050	1050	5%	1050/1000

Factor \*  $(1+10\%)(1+10\%)(1+10\%) = 1.331$   
 $(1+8\%)(1+8\%)(1+8\%) = 1.166$   
 $(1+5\%) = 1.05$

Yield to maturity, annual average return and IRR all refer to the same thing. In government bonds, we use the term yield to maturity, which in project appraisal, is the project's IRR. In definition, yield to maturity refers to the IRR of a bond's promised cash flows. It is the rate that discounts a bond's promised cash flows to equal its market price. It means finding the rate that gives a zero net present value. It is the average per period rate of return on the money invested.

**Exercise:** An investor invested in government bonds A to D. All bonds have a fixed or coupon rate to calculate their face value. The spot rates are 5%, 6% and 7% for one, two and three years respectively. Work out the forward rate for year two and three, and the bond prices, which are determined by adding all the present value cash flows.

**Table 2: Government Bonds, Cash Flows and Bond Prices**

Investment: \$1000 each	Bond Rate	Cash Flows		
		Year 1	Year 2	Year 3
A	6%	1060		
B	6%	60	1060	
C	8%	80	80	1080
D	4%	40	40	1040
E	10%	100	100	1100

**Table 3: Spot Rate Table**

Year	Interest Rate	Factor
1	5%	1.050
2	6%	1.124
3	7%	1.225

**Answer:** The market price of a security is the sum of the present value of cash flows expected to generate by security discount at appropriate cost of funds. For bonds, it is the sum of all cash flows discounted at spot rates for the relevant years. For forward rate, you can apply the same method.

To test what you have learned so far, you can work out the three different methods of calculating bond value and how spot, forward, yield and IRR relate to each other.

**Table 4: Government Bonds, Cash Flows and Bond Prices**

Investment: \$1000 each	Bond Rate	Bond Price	Cash Flows		
			Year 1	Year 2	Year 3
A	6%	1010	1060		
B	6%	1001	60	1060	
C	8%	1029	80	80	1080
D	4%	923	40	40	1040
E	10%	1082	100	100	110

Spot Rate Table			Forward Rate	
Year	Interest	Factor	Calculation	Rate
1	5%	1.050	1.05/1.0	5%
2	6%	1.124	1.124/1.05	7%
3	7%	1.225	1.225/1.124	9%

Bond Price = Present value of all cash flows. Calculations are shown below.

1010 =  $1060/1.05$   
1001 =  $60/1.05 + 1060/(1.06 \times 1.06)$   
1029 =  $80/1.05 + 80/(1.06 \times 1.06) + 1080/(1.07 \times 1.07 \times 1.07)$   
923 =  $40/1.05 + 40/(1.06 \times 1.06) + 1040/(1.07 \times 1.07 \times 1.07)$   
1082 =  $100/1.05 + 100/(1.06 \times 1.06) + 1100/(1.07 \times 1.07 \times 1.07)$

**Different Methods for Finding the Present Value of Bond C**

- Spot Rate =  $80/1.05 + 80/(1.06 \times 1.06) + 1080/(1.07 \times 1.07 \times 1.07) = \$1029$
- Forward Rate =  $80/1.05 + 80/(1.05 \times 1.07) + 1080/(1.05 \times 1.07 \times 1.09) = \$1029$
- Yield =  $80/1.069 + 80/(1.069 \times 1.069) + 1080/(1.069 \times 1.069 \times 1.069) = \$1029$

Explanation	Year 1	Year 2	Year 3	Present Value
Cash Flow (a)	80	80	1080	
IRR (b)	6.90%	6.90%	6.90%	
Formula (c)	(1+IRR)	(1+IRR) <sup>2</sup>	(1+IRR) <sup>3</sup>	
Factor (c)	0.94	0.88	0.82	
e = a x d	75	70	884	1029

### vi. Discounting and Net Present Value

Present value means the worth of all future cash flows at present time. Discounting refers to finding the present value of a future cash flow and is often called “discounting the cash flow”. The formula is  $\$1/(1+\text{interest})$ . It is the reciprocal of compound interest. More will be touched on when we talk about investment appraisal.

**Example:** You are to receive \$5,000 in a year or two. If the current interest is 5%, how much is it worth today? The answer is  $5000/(1+0.5) = \$4,762$  in a year and  $5000/(1+0.5)(1+0.5)$  or  $4,762/1.05 = \$4,535$  in two years.

### vii. Annuity and Discounted Cash Flow

Annuity means a series of fixed amounts invested annually across a definite future time zone. Finding the present value of an annuity is the same as discounting a stream of future cash flows to the present time, using the same period discount rate for all cash flows. One way is to set up a simple table with each year’s cash flow side by side with the discount rate. However, it is faster to refer to the annuity present value table (Appendix 1), which can be easily laid out using a spreadsheet. Both methods are shown below.

**Table 5**

Method (1)		Compound Interest Factor				Total \$ With Interest
Compound Interest Factor		0.05	0.0525	0.05513	0.057881	
Year	Annuity	Year 1	Year 2	Year 3	Year 4	
1	2,000	100	105	110	116	2,431
2	2,000		100	105	110	2,315
3	2,000			100	105	2,205
4	2,000				100	2,100
Total	8,000	100	205	315	431	9,051

Method (2) - Annuity Table	4 Years	3 Years	2 Years	1 Year	
Annuity Factor 5%	1.2155	1.1576	1.1025	1.0500	
Annuity \$	2,000	2,000	2,000	2,000	8,000
Total with Interest	2,431	2,315	2,205	2,100	9,051

### viii. Typical Questions on Fixed Income Return

The following are typical questions on fixed income return. Assuming the current interest rate is 10%, do you know how to work out the answers?

#### Question 1

John invested \$1,000 for five years at compound interest. How much will he get at the end of the fifth year?

**Answer:** (compound interest)  $1,000 \times 1.611 = \$1,611$

#### Question 2

Mary invested an annuity of \$2,000 for five years, how much will she get at the end of the fifth year?

**Answer:** (annuity)  $2,000 \times 6.716 = \$13,432$

#### Question 3

If Susan receives an investment income of \$10,000 every year, what is the present value of the amount in year five?

**Answer:** (discounting)  $10,000 \times 3.791 = \$37,910$

#### Question 4

If Karen wants \$100,000 by the end of the fifth year to buy a house, how much must she put into the bank each year to get that money?

**Answer:** (annuity discount)  $100,000/6.716 = \$14,890$

#### Question 5

Mok wants to be a millionaire. He has no investments but is able to put \$10,000 a year into fixed deposit, how many years will it take for Mok to achieve his goal?

**Answer:** (annuity)  $1M/10,000 = 100$ , so look for the nearest factor to 100 in the annuity table and you will get 97.347 for 24 years and 108.83 for 25 years. So,

Mok needs 24 years and 3 months.

The discount or compound factor can be easily obtained in the present or future value tables (Appendix). The various factors can also be obtained through the method below.

**Table 6: Discount and Compound Factor**

Interest Element		Year 1	Year 2	Year 3	Year 4	Year 5
Interest	10%					
Formula $1/(1+\text{interest})^n$		$1/(1+10\%)$	$1/(1+10\%)^2$	$1/(1+10\%)^3$	$1/(1+10\%)^4$	$1/(1+10\%)^5$
(1) Discount Factor for PV		0.909	0.826	0.751	0.683	0.621
Formula $(1+\text{interest})^n$		$(1+10\%)$	$(1+10\%)^2$	$(1+10\%)^3$	$(1+10\%)^4$	$(1+10\%)^5$
(2) Compound Factor		1.100	1.210	1.331	1.464	1.611
Calculation (Prior Year Factor+1)	b		1.909	2.736	3.487	4.170
(3) Discount Factor - Annuity	$c=b/1.1$	0.909	1.736	2.487	3.170	3.791
Calculation (Prior Year Factor+1)	d		2.100	3.310	4.641	6.105
(4&5) Compound Factor - Annuity	$e=dx1.1$	1.10	2.310	3.641	5.105	6.716

Now, try to work out the answers if interest is 5% instead of 10%. Answers are provided below for you to doublecheck.

**Answers:** (1) \$1,276, (2) \$11,604, (3) \$43,290 (4) \$17,235 (5) 36 years

## CHAPTER 4 INCOME STATEMENT AND RATIO ANALYSIS

### A. Introduction to Income Statement (aka Profit and Loss Account)

What is an income statement? It is a statement showing sales revenue (income) less all costs and expenses. It reflects the performance and financial results of a business over a period of time that closes at a specified date. Whilst many companies close at the end of a month, many American companies choose to close on a 445 sequence (two four-week periods followed by a five-week period). The income statement represents the operating results and performances of an entity during a specified period.

#### Profit and Loss Account Structure

Revenue (R): Sales revenue and all other income received for services provided  
 Expenses (E): Cost of goods sold and all expenses incurred in providing services  
 Profit (R-E): Revenue less expenses

Profit is the sole objective for businesses, unless we are running a welfare or non-profit organization. Therefore, business performances and all related information and data will be of the greatest concern.

In order to investigate the current status of a company, we need to regularly review and understand all relevant financial reports, including detailed sales analysis, income statement and variance reports. We should also look into relevant ratios such as profitability ratios that are measured against sales revenue, contribution margin, gross profit margin, income or profit before and after tax.

It does not matter how large or reputable a company is, one slip into risky investment or human error during an economic downturn can handicap operations or even kill the company. Though we cannot preempt risks, operating ratios do reveal and protrude the strengths and weaknesses of a company's operations. In addition, we should not overlook its day-to-day management.