

1. One of the most talked about Investment theories is Efficient Market Hypothesis which probably most of you have at least heard about. Essentially, it tells you that because information is freely available, everyone is using it, and hence securities are priced correctly.

2. There are 3 form of Efficient Market Hypothesis, weak, semi-strong, and strong, and each differs in the level of information that is available for the investor.

In today's world we usually see semi-strong or strong form of EMH.

3. Thus, since information is available to everyone, everyone is using it and by this phenoma it means that prices are true. However, the theory is debated between academics, some are saying that even if information is available, it will not necessarily be used.

4. Second theory that we will talk about is Modern Portfolio Theory. First, it assumes that all investors are rational, and that diversifying your portfolio will reduce the overall risk, even if individual stoks are higher-risk. It essentially narrows down to low-risk = low-reward, and vice versa.

5. The theory also says that by diversifying you only eliminate specific risk, and there is some level of risk that cannot be diversified, which is called systematic risk. Here is a graph of how it looks.

6. By combining different securities in your portfolio, you can create what is called efficient frontier. Efficient frontier, and to its right are all available allocations of your portfolio. Hence by constructing efficient frontier you can see which combinations of individual securities can give you the best risk/reward ratio.

7. And of course, the most famous - Capital Asset Pricing Model. It is a simple formula that says the expected return on a security (or portfolio) is equal to the rate of return of a risk-free security (usually a 3-month Trasury bill) plus a risk premium. However, it also assumes that all investors can borrow and lend at the same risk-free rate, everyone is well diversified, no tax, and other assumptions outlined in this slide.

8. Here is the famous formula, and you can calculate the expected return of your investments with relatively little data, or course more data might give you more accurate result. But again, since it is using past data, it is not an indication of

the future, rather than expectation.

9. With the risk premium of your investment and the risk-free rate you can draw the Security Market Line and see what return you should expect based on the beta of your investment.

10. To give you an example, imagine that a risk-free rate is 5% (which is an absolute fairytale) and the return on FTSE100 is 10%, you calculate your stock beta and it is 1.5, you then plug those numbers in CAPM and, as you can see, you should expect a 12.5% return.

Note that it is based on what series data you are calculating, that is if you take an annual coupon of a bond for a risk-free rate, and calculate annual FTSE 100 return, you should expect 12.5% return in one year, rather than tomorrow or next month.

11. There is a branch of studies called behavioural economics, and its main focus are biases that human beings exert when making decisions, and they also apply in the financial world. I have outlined three main ones that you should be aware of. Loss aversion is when you feel more satisfied and potential gains rather than avoid losing the same amount, i.e. you will be more sad to lose £100 than more happy to gain £100.

Confirmation bias says that you will unconsciously try to find information that confirms your beliefs or analysis.

12. Hindsight bias tells you that patterns always make sense and you can be absolutely sure that you can predict the future by looking at the past data. Of course, there are a lot more of these cognitive biases, and we will upload a small list of the main ones that financiers should be aware of.

13. The rest of the session will be dedicated to looking at financial statements of the companies, and ratios to see if the company is worth investing in.

Three main statements that you should be looking at are balance sheet, income statement, and cash flow statement. You can always find these statements of publicly traded companies at morningstar.com. Also, we will upload a guide for financial statement analysis.

14. Liquidity is not only important to an investor, but also to companies as well.

Of course, it depends on in what business they operate, but every company has to maintain some level of liquidity in order to meet its obligations, whether it is to

pay suppliers, pay wages, or to respect their debts.

15. Current ratio is concerned with liquidity of the company in the short-term, as calculations include current assets and current liabilities, current assets are cash or cash equivalents (certificates of deposit, short-term investments, etc.), and current liabilities are usually debts that are due within 12 months. As the calculations suggest, a ratio below 1 means that company does not have enough cash or cash equivalent to cover its liabilities that are due within one year, and anything above 2 indicates that there are money that could be invested.

16. There are some practical issues that you should be aware of when using current ratio, and the main one is that the ratio is static and that it reflects values at a point in time, that is when the statements were released, and sometimes the latest statement you can get is one year old and thus current ratio might not be relevant, specially nowadays.

17. Another liquidity ratio that mitigates one of the issues from current ratio, is quick ratio, which is basically the same but you subtract inventory from the current assets in the nominator. This is because sometimes it might be very hard to sell some inventory, for example heavy machinery, or even aircraft.

18. Of course, by investing in a company you want to know how profitable it is, and specially how profitable it is compared to its peers, we will look at a couple of profitability ratios to help you get a grasp of how to compare different companies.

19. Firstly, you should know that profitability ratios are mainly calculated by looking only at an income statement of a company, and the trio of ratios you should always calculate are outlined here. Don't forget that for a single company, such ratios won't tell you the whole story, you need to compare them to the firms in the same sector in order to determine which company has the best profit margins.

20. There is one ratio that probably everyone is using to measure overall management performance of a firm. Effectively it is a yield on your company as it looks at what returns company has generated from the total capital employed including debt as well as equity.

21. There are two versions of ROCE, first one is obviously simpler, and for the most part I would suggest to use it as you only need two inputs. However, if you want to

challenge yourselves, you can use the second formula, but most of the time you will get very similar or even same results, depending on the company's own calculations of their profits.

22. There are some things that you should bear in mind when calculating ROCE, of course the one mentioned before that sometimes you can only find financial statements that are very old, and there are some accounting issues that can affect ROCE that are outlined in this slide.

23. Moving to valuation ratios, that are more concerned with shares and their prices, we have Earning per share, and as the name suggests it tells you how much company earns per one share that you are buying, so for example if EPS is 24 pence and the share price is 200 pence, it means that, *ceteris paribus*, that you are paying 2 pounds for 24 pence of profits of the company.

24. And here is a simple example where you can easily calculate EPS, simply divide net profit by the number of shares.

25. Again, EPS are mainly used to see how many times the EPS must be paid to buy a share i.e. how expensive or cheap that share is.

26. You might have heard of Price/Earnings ratio, and you should know that there are several types of it, but the most commonly used is the simplest one where you divide the price of a share by the earnings per share to see how many times you are paying for company's profits.

27. So, here are three types of P/E ratios, that is trailing price earnings, trailing from continued operations, where instead of net profit, you use operating earning, and forward P/E, where take an estimate (either from public domain) or estimate yourself and plug in a normal P/E formula.

28. Here is another way of how to calculate price/earnings ratio, but you should remember that you should always compare your P/Es with other companys in the industry, and take a note that comparing P/Es with companies in different sectors will give you nothing as different businesses operate in different ways and some are cash-intensive, and others are capital-intensive, that is they heavily rely on their plant and equipment.

29. Right, there are two more ratios that you should know, and they concern dividends.

Dividend yield, as the name suggests, tells you what yield you should expect on your

investments in a share, and it is very simply to calculate, as you can see.

30. Note that dividend yield applies only to mature companies which are paying dividend, and it is better to calculate dividend yield on a company that has been regularly paying dividends for at least 5-7 years, rather than a newcomer who just started paying out.

31. Also, when you construct your portfolio, it might be reasonable to compare your dividend yield with yields on government bonds, of course taking risk into account.

One more thing with yield is that when dividend yield is low (compared with previous years) it might indicate that a share is overpriced, and when the dividend yield is high, share might be underappreciated.

32. Lastly, dividend cover. It is a ratio which basically tells you how many times the company earns more than it is paying dividend, and helps you assess whether the dividend will be maintained. Also, high dividend cover tells you that company might be hoarding cash if it anticipates big investment opportunities, or, for example, in such times, anticipates hardship.