



**GUIDE TO IAG**

**OR**

**THE CHEAT SHEET TO WALL STREET**

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# Introduction

What are financial markets? What is IAG all about? This guide has been written to serve as the introduction to IAG and a primer into the confusing and, at times, illogical world of financial markets. A careful reading of this guide will bring you up to speed so that you will be able to understand the content of our presentations regardless of your background and give you a skill set that will set you on the way to a lucrative career on Wall Street, if that is your goal. Whether you want to work for Wall Street, or want to know how markets work, or just want to learn more about the world of financial services and investing, this guide will prove useful. It also serves as a roadmap of your entire education at Stern, as well as providing an insight into the very essence of Wall Street.

## Chapter I: Financial Markets and Concepts

### *An Overview*

What are financial markets about? What does it mean to invest in securities? This section of the guide aims to orient you with financial markets, and what finance is really all about. Corporate Finance concerns itself with two questions – how should I raise capital, and how should I spend it (respectively termed capital structuring and capital budgeting).

From a corporation's point of view, financial markets are important because they provide the capital that a firm needs to grow, and because their very purpose is to maximize shareholder return<sup>1</sup>, which is analogous to 'increasing the profits of the owners'. There are two ways in which a firm can receive capital from financial markets. They are debt and equity. *Debt* represents an obligation to repay a certain principle amount plus a certain amount of interest at specified times to person or institution that owns the debt. *Equity* represents a share in ownership of a firm, and generally an entitlement to voting rights as well as a share of the profits generated by the firm. *Capital Budgeting* then concerns itself with how it should use this capital, ostensibly to increase the returns to shareholders.

IAG, along with investors that include pension funds, university endowments, mutual funds, hedge funds and individual investors are the participants in financial markets, trading both the equity and the debt of corporations.

### *Financial Instruments*

As mentioned above, firms can raise capital by issuing both debt and equity. There are various types of debt and equity as well as some securities which are a combination of the two, in addition to various financial instruments that aren't even issued by corporations. In general, corporations that are public (that is, with equity / shares that are available to the public) can offer common stock, the most basic form of equity. This is the major focus of IAG, and represents a share of ownership in the company and a proportion of profits, as well as voting rights on issues such as electing a board of directors, the choice of an independent auditor and numerous other issues. Although many companies with common stock pay regular dividends, this is not a requirement – a company may choose to reinvest the profits back into the company, in the hope that it will be able to grow and provide even bigger dividends down the line – a fine example is Microsoft, who only recently

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<sup>1</sup> This is a very interesting topic, beyond the scope of this introductory guide and is debated by both academics as well as the industry. What is shareholder return, and what time frame should we consider?

declared dividends, choosing instead to reinvest in the company in the past. A company can also issue preferred stock, which generally forgoes the voting rights, but promises certain dividends. A company's debt options are even more complicated. A company may take a loan from a bank ("bank-funded debt"), which is relatively straightforward. They may issue bonds ("capital markets-funded debt"), which in turn may have several features, such as being callable at any time (the company may make a lump sum payment at any time to retire the debt and avoid paying remaining interest), callable at specific times (a.k.a. a 'Bermudan bond'), convertible (where the buyer of the bond can convert the bond into common stock), secured or unsecured (whether the bond is backed by assets as collateral in the case of default), high yield or investment grade (depending on the credit rating of the company<sup>2</sup>) etc. In the case that a company defaults (i.e., they are unable to make the interest payments on their debt), who gets the first claim on the liquidated assets of the company? Common stock is always last, which is why they have the highest return (see *Risk and Return*). Generally, bank loans get repaid first, followed by the debt in order of 'seniority' (senior secured debt gets paid off next, followed by subordinated secured, followed by unsecured debt, followed by debt/equity 'mezzanine' financing, followed by preferred stock, and at the very bottom of the totem pole, common stock).

Investors can also trade in financial instruments that aren't issued by corporations. Governments also issue debt, but not equity – in the US, we have the treasury bills and treasury bonds; many of the stable governments in the world issue debt, which the public can buy. In the US, the federal government issues treasuries, and local governments can issue municipal bonds.

There are derivatives, whose value depends on an underlying security. This can be a company's stock, in which case, these derivatives are called options. Buying a call gives me the right, but not obligation to buy a share of a company's stock at a fixed price (the strike price) before a certain time (expiration date – note that American style options allow you to exercise at any point before the expiration date, and that European style options only allow you to exercise on the strike date). A similar instrument is a put, giving me the chance to sell a share at the strike price before the expiration date. Options with extended expiration dates are known as LEAPs, and there are many exotic options available that aren't traded on exchanges.

Other derivatives include futures, which are best seen with respect to commodities. Buying a futures contract will allow me to sell a certain commodity (for example, oil, gold, steel, wheat, etc) at a certain price on a certain date. Another derivative instrument is a swap. Buying a swap allows me to swap one thing for another. A common example is an interest rate swap, which allows me to swap a fixed interest rate (say, 5%) for a floating interest rate (say, LIBOR<sup>3</sup> plus a spread). There are also currency swaps (swapping one currency for another), as well as more bizarre swaps such as credit default swaps, and swaptions – an option to enter into a swap. There are so many instruments to invest in that it is common to see people and entire companies focus on a certain type of instrument which they can become experts in, rather than try to be an expert on every financial instrument.

In addition to buying these securities, one can also short sell them. This consists of 'borrowing' a security from a broker, selling it immediately, and buying it back/returning it to the broker down the

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<sup>2</sup> Credit ratings are carried out by a few companies – namely, Standard and Poors, Fitch and Moody's in the US.

<sup>3</sup> LIBOR is the London Inter Bank Offer Rate, and is the basis for many floating interest rates.

line. There are various restrictions in place (one cannot short sell common stock on a ‘downtick’ a price decline); and selling options is referred to as ‘writing’ options.

## ***IAG and Investors***

IAG’s focus is to replicate the research division of a buy side fund, and to make educated investments based on our research. The way that we are structured imitates a mutual fund, in that we can only invest in long positions on equity – we cannot take short positions, or invest into derivatives, fixed income instruments or use leverage (i.e., borrow money to take larger positions to increase our returns). However, that does not mean that we ignore these very important aspects of investing.

Mutual funds are funds open to the public, and are heavily regulated. They are required to disclose their portfolio positions at regular intervals and are limited in their investment choices. Private funds (especially hedge funds and private equity funds) are less regulated, disclose their positions at their whim, and may invest in anything under the sun, may lever themselves. These are also the funds are not open to the public, but are limited to wealthy individuals and institutional investors (which are pension funds, university endowments, etc).. They generally charge higher management fees than mutual funds (based on both their performance and a percentage of their total assets under management) but have had some amazing success stories. They are technically limited to a small number of investors, but can circumvent this by having a trust (a legal entity) as one of these investors, which can in turn allow countless other institutional investors to invest in the fund. Hedge funds tend to focus on certain strategies or instruments; private equity funds invest in leveraged buyouts<sup>4</sup>, where they take public companies private, and later bring the companies public at a large profit. There are also venture capital funds which invest in developing businesses.

## ***Time value/ Discounting***

The idea behind the time value of money and discounting is simply that a dollar today is worth more than a dollar in the future because money received today can be invested and grown to a greater amount. For example, if you have the option of receiving \$120 a year from now or \$100 today, there is one other piece of information you need to know in order to make an effective decision. You need to know what \$100 invested today would be worth a year from now. This is your opportunity cost and your cost of capital, which is also known as a discount rate.

There are two concepts here. One is future value, which can be used to determine what the \$100 received today would be worth one year from now. The other is present value, which can be used to determine what the \$120 you have the option to receive a year from now is worth today.

$$PV = FV / (1+R)^T$$

Alternatively:

$$FV = PV * (1+R)^T$$

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<sup>4</sup> Leveraged Buyout transactions are very interesting to study and are a hotly debated topic in finance. Essentially, a small amount of ‘equity’ in cash is put up and combined with a lot of debt, which is subsequently paid down by the company’s cash flow; the private equity investor (or ‘sponsor’) then sells the company down the line.

R represents the discount rate and T the time period, in this case measured in years. Let us assume a high discount rate of 25%. We can calculate the future value as follows

$$FV = PV * (1+R)^T = 100 * (1 + 25\%)^1 = 125$$

Generally, the present value calculation is more important as discounting is more widely used, as it is more convenient for most purposes.

$$PV = FV / (1+R)^T = 120 / (1 + 25\%)^1 = 120 / 1.25 = 96$$

Both calculations will give us the exact same conclusion, and that is that the \$100 today is worth more than the \$120 a year from now *based on the discount rate that we have*. The same principle of discounting can of course be applied to payments many years away as well, and thus it is simple to calculate the value of future cash flows. Note that this represents annual discounting. Most bonds make semi-annual payments, so one must use semi annual discounting to properly evaluate them. It is also possible to discount on a weekly or daily basis; one can discount every second, or discount ‘continuously’, at infinitely small time periods.

### **Discount Rates**

**Cost of Capital:** The *cost of capital* is simply the borrowing cost faced by the firm, and it can either be implicit or explicit. An example of an explicit cost is direct interest expense. Say for instance that you borrow \$100 and promise to pay back \$105 at the end of the year. In this case, you are paying 5% interest, and that represents your cost of capital. The concept of a cost of capital plays an important role in capital budgeting.

An example of an implicit cost of capital is opportunity cost. If you have \$100 and decide to start a business by purchasing \$100 worth of inventory, equipment, and the like, you must look at what your other options would have been. If you could have made a 10% return by investing in the stock market, then this represents an implicit cost of capital. Had you not pursued this business venture, you would have earned 10% interest for yourself through investing. This cost must also be factored into a decision making process to ensure that your capital is used for the best possible purposes. This more commonly applies to equity, though again there are exceptions.

**Return on Capital and Return on Equity:** *Return on capital* is the profit earned by a firm plus any interest paid to debt-holders, divided by the combined debt and equity of the firm. *Return on equity* is the profit made by the firm divided by the total value of the equity of the firm. For example, let us look at the following hypothetical example of Firm A.

Firm A’s Profit: \$15

Firm A’s Interest Payments: \$5

Firm A’s Debt: \$50

Firm A’s Equity: \$50

$$\text{Return on Capital} = (\text{Profit} + \text{Interest}) / (\text{Debt} + \text{Equity}) = (15 + 5) / (50 + 50) = 20\%$$

$$\text{Return on Equity} = (\text{Profit}) / (\text{Equity}) = (15) / (50) = 30\%$$

This is a very basic description of these concepts; the key difference between equity and total capital comes from the fact that total capital includes debt, while equity by definition does not.

**An Assumption about Growth:** It is also possible to use return on capital or return on equity to determine how fast a company will be capable of growing. To illustrate this, consider the following example. You have a \$1,000,000 retirement nest egg, and you can make a 10% return each year. This means that your first year, you will receive \$100,000. If you are content to continue to make \$100,000 each year, that would be fine; however, there are inflation concerns, and you also want to raise your standard of living over time. If you don't want to borrow money, the only way to make more money is to put some of the \$100,000 you make your first year back into your nest egg. This equation will determine the growth in income that you obtain.

$$\text{Growth} = (\text{Return on Equity} * \text{Reinvestment Rate})$$
$$\text{Growth} = (10\% * \text{Reinvestment Rate})$$

Under these conditions, you can grow your nest egg and future earnings at 10% a year; however, to do that you would have to reinvest all of your income. This is unrealistic, and in business, most mature companies do not do this either. Assume you can live off of \$50,000, and so you can reinvest half of your income.

$$\text{Growth} = (\text{Return on Equity} * \text{Reinvestment}) = (10\% * 50\%) = 5\%$$

Now you have determined the rate at which you can grow your income each year. This same concept can be applied to see how quickly companies can grow and thus to help value a company as well.<sup>5</sup>

**One Important Note:** Having shown the basic definitions of return on capital and cost of capital, the two cornerstones of finance, there is one point that must be made clear. Return on capital should exceed cost of capital. Essentially, if you borrow money at a 10% interest rate and make a 20% return, then you are doing fine. If you borrow at that same rate and can only make a 5% return, then there is a problem – you should have invested in the first place, which leads us into the next topic of NPV and IRR.

## ***NPV and IRR***

Net Present Value (NPV) is another one of the most commonly used financial principles. What NPV calculates is the value of future cash flows assuming a certain cost of capital. It is the basis of investment decisions and also the core concept that is behind most valuations. Consider the following example.

Initial Investment: -\$1,000  
Year 1 Cash Flow: \$500  
Year 2 Cash Flow: \$500  
Year 3 Cash Flow: \$500  
Discount Rate: 10%

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<sup>5</sup> Note that this is not a perfect equation and that there are problems associated with it which will become more clear as you learn more about business and accounting; however, it is in general a very useful guide.

You must pay the \$1,000 figure up front, so that means immediately there is a negative cash flow, as is the case when making an investment. The future cash flows must be discounted appropriately.

$$\text{NPV} = \text{Initial Investment}^6 + (\text{Year 1 Cash Flow}) / (1+R)^1 + (\text{Year 2 Cash Flow}) / (1+R)^2 + (\text{Year 3 Cash Flow}) / (1+R)^3 = -1,000 + (500 / 1.1^1) + (500 / 1.1^2) + (500 / 1.1^3) = \$243.43$$

In this case, positive value is generated by this investment.

The *Internal Rate of Return or IRR* is the discount rate that if used will give the firm an NPV of 0. It should be noted that IRR's may be positive, or negative, but are expressed as a %. To use the example above:

Initial Investment: -\$1,000

Year 1 Cash Flow: \$500

Year 2 Cash Flow: \$500

Year 3 Cash Flow: \$500

Note that the discount rate is not included, because it is not needed for this calculation. The following equation will give us the IRR of the firm:

$$\text{Initial Investment}^7 + (\text{Year 1 Cash Flow}) / (1+\text{IRR})^1 + (\text{Year 2 Cash Flow}) / (1+\text{IRR})^2 \dots + (\text{Year N Cash Flow}) / (1+\text{IRR})^N = 0$$

$$-1,000 + (500 / (1+\text{IRR})^1) + (500 / (1+\text{IRR})^2) + (500 / (1+\text{IRR})^3) = 0$$

IRR = 23%

This tells us that the investment is a wise decision if we know that the cost of capital is less than 23%, because it will meet the criteria that return must exceed cost of capital. One should note that there are several peculiar attributes of the IRR – namely, that multiple IRR can exist, and in some cases, there is no IRR (or there is what is known as an ‘imaginary’ IRR). This happens if the signs of the cash flows change more than once (returning to our example, the negative investment and the future cash flows have only one sign change, and hence have a unique IRR; if there were future negative cash outlays, we would see multiple IRRs).

Consider the following with multiple IRRs:

Initial Investment: -\$1,000

Year 1 Cash Flow: \$800

Year 2 Cash Flow: \$1,000

Year 3 Cash Flow: \$1,300

Year 4 Cash Flow: -\$2,200

You can verify that two IRR's exist: 6.6% and 36.55%. This may seem confusing at first, but ultimately, neither is fully correct. Note that many times, it is common to have one positive and one negative IRR.

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<sup>6</sup> Remember this is a negative value

<sup>7</sup> Remember this is a negative value

An even more confusing example with an imaginary IRR is as follows:

Initial Investment: \$1,000

Year 1 Cash Flow: -\$2,000

Year 2 Cash Flow: \$1,500

Here, we cannot compute a 'real' IRR.

Most people feel that IRR and NPV are equivalent concepts, but while they are similar, there are a few key differences. IRR is useful in that it scales the returns relative to the initial cost; the NPV just gives a dollar value, ignoring the fact that the initial cost could be \$1 or \$1 million. On the other hand, the IRR assumes that all cash flows are invested at the IRR, thus not allowing for multiple discount rates. This can pose a serious problem in capital budgeting, where a manager may not invest in a project on an IRR basis but should invest in it on an NPV basis (as it has a positive NPV). IRR may also be easier to use as one is not required to estimate the 'cost of capital'. Although NPV calculations require more information, they are generally more useful in capital budgeting contexts.

### ***Risk, Return and Efficient Markets***

One very important concept is that of the relationship between risk and return. Quite simply put, the greater the risk, the greater the return. The 'law of one price' dictates that if two different investments have an identical risk profile, they will have an identical expected return. This result is an offshoot of the efficient markets hypothesis – for if this weren't the case, there would be the chance for a riskless profit ("arbitrage") by short selling the lower return investment and going long on the higher return investment, and locking in that spread as the arbitrage profit.

One of the more intensely debated topics in modern finance is known as the Efficient Markets Hypothesis ("EMH"). It exists in three main forms – Strong, Semi-strong and Weak. It states that stock prices already reflect all known information and are therefore accurate, and that the future flow of news is random and unknowable. The most obvious implication is that that information cannot be used to trade profitably, as everyone has access to that information and everybody will use it efficiently to make educated investment decisions. In its strong form, the 'information' includes all insider information as well as publicly available information so that no one can make any excess returns via any trading strategy. If this were really true, then why would the SEC exist to curb insider trading? However, its other forms are much more plausible. In its semi-strong form, share prices adjust to reflect publicly available new information, so that no excess returns can be earned by trading on that information, and in this sense, fundamental analysis cannot be used to generate excess returns. In its weak form, historical information (and hence technical analysis) cannot be used to generate excess returns as this information is already priced into the stock.

How does the Efficient Markets Hypothesis hold up under closer examination? Some of the crucial assumptions – that everyone uses the information in the same way to make the same decisions, that prices adjust instantly, or that markets are rational can all be intensely debated, and has led to advances in areas such as behavioral finance, which explores non-rational markets. IAG has a strong record for 'beating' the market, as do some other notable investors. One fine example is nicknamed the 'January Effect' – where lots of stocks are sold before the year end, causing prices to drop in December, and are bought back after the new year, making the price go up in January. This

has been explained as investors seek tax benefits, or feel more optimistic after the new year (especially as they may receive bonuses). As investors realize this, they will tend to buy more stock in December (at low prices) and benefit from the run up that occurs in January. However, once everyone does this, then prices in December are higher, wiping out the January effect. One cannot ignore the EMH; especially at IAG, one of the most important questions we ask ourselves is why the information we have is not already priced into the stock price.

## **Chapter II: Financial Accounting Basics**

### ***An Overview***

It is often said that accounting is the language of finance, and in order to be a successful financial analyst, it is essential to understand accounting and financial statements. A solid grounding in accounting will allow you to analyze companies quickly and thoroughly, as well as enabling you to pinpoint problems that others less capable in accounting might fail to notice. In this segment, we will cover some of the basic accounting principles, followed by a quick look at a typical company's financial statements.

### ***The Accounting Equation***

This is arguably the first and most important you will learn in Stern:  $A = L + E$ , or, Assets = Liabilities + Shareholders Equity. Assets represent the value of everything owned by the company that is worth something; this can include cash, buildings, land, stock in other companies, tax breaks, etc. Liabilities represent claims of other parties on your assets – this can include debt, accounts payables (to be defined later), mortgages, etc. Lastly, Shareholders Equity represents what the company's shareholders are entitled to – and this includes common stock, preferred stock and retained earnings, which we will discuss later.

### ***Flow versus Stock Variables***

A flow variable is defined as a variable which is a function of time. An example of this is income, where pay for work is defined either as a fixed salary for a period of time, or as an hourly wage. Either way, this flow variable is a direct function of a given amount of time. Both the income statement and statement of cash flows use flow variables. An important property of these flow variables is that they are additive.

On the other hand, a stock variable is a fixed amount. The basic example here is your net worth. Essentially, you take a snapshot at a particular moment in time and you come up with a single number. The balance sheet is the financial statement that gives flow variables. Flow variables are not additive, and so when looking at financial statements, the only valid balance sheet numbers to use are the most recent. Under no circumstances should balance sheets for a company at different time periods be added together when attempting to determine the assets, debt, or equity of the company.

### ***Debits and Credits: An Overview***

In accounting, debits must equal credits. This is part of a concept called double entry bookkeeping. Debits are not good or bad; neither are credits. The concept of debits and credits is probably one of the most annoying aspects of accounting to the introductory student. However, a lot of confusion

can be avoided by observing that a debit means “the left side of an account” and that a credit is “the right side of an account”. Hence, when an asset increases, it is shown as a debit, and if it decreases, it is shown as a credit. Since Liabilities and Equity are on the other side of the fundamental accounting equation ( $A = L + E$ ), they work in the opposite way – if a liability/equity increases, it is shown as a credit. In this example, assets can be defined as what a firm owns, liabilities as what a firm owes, and equity as the difference between assets and liabilities.

### ***Cash versus Accrual Accounting***

On income statements, companies use something known as accrual based accounting in an effort to fairly report the financial performance of the company. In *accrual based accounting*, there is an effort to record expenses and revenue as they are incurred or earned, and to match the correct expenses with the correct revenue. In *cash based accounting*, however, the company recognizes revenues and expenses as cash is received or paid out. Three common examples of cash versus accrual accounting are:

*Capital Expenditures:* Capital expenditures are a form of investment made by a company to acquire land, build a plant or building, and in general, to purchase anything with a long lifespan. In cash based accounting, these would be expensed immediately. In accrual accounting, however, the cost is divided over the useful life of the asset. A fraction of the asset is thus written off, or *depreciated* each year. There are different methods of depreciation, such as straight line, double declining and sum of digits, to name but a few (for tax purposes, most companies now use a Modified Accelerated Cost Recovery Schedule aka MACRS). In its most basic form, straight line depreciation, the fraction written off is just 1 divided by the useful life of the asset. So, a \$1,000,000 capital expenditure with a 10 year useful life is written off over 10 years, with \$100,000 written off as an expense each year. This ‘capitalizing’ of expenses can get complicated, and played a key role in the WorldCom scandal.

*Trade Credit:* Accounts Payable and Receivable

Accounts payable are created when a company purchases goods yet does not pay immediately, but promises to pay in the future. Accounts receivable conversely are created when a company completes a sale, but does not receive cash, but instead gives an invoice to the buyer.<sup>8</sup> Under accrual accounting, when the sale is completed, the associated revenue from accounts receivable is counted, while under cash based accounting, it would not be counted until the cash was actually received.

*Inventory:* When a company purchases inventory, it typically pays cash or else uses short term trade credit, which is recorded in accounts payable. Under accrual accounting, inventory is not expensed until it has been sold, where it is expensed under “Cost of Goods Sold.” Under cash accounting, the expense is recorded when cash has actually changed hands.

### ***Essence of Financial Statements***

There are three main financial statements - the balance sheet, the income statement, and the statement of cash flows - which concern us, and they will be addressed in turn. It should not be

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<sup>8</sup> Buyers do not always pay, and thus some accounts receivable never result in cash payments and must be written off as a bad debt expense. Normally, a company will create an allowance to estimate the percentage of accounts which will be delinquent, and this will further affect the number for accounts receivable, but that goes beyond the scope of this guide.

surprising to find that the three financial statements are related to each other. Some forecasting methods in fact call for forecasting future values of all financial statements. Typically, one starts with the income statement, and uses knowledge of the interrelation of financial statements to complete the forecast. Many financial valuations are done by measuring free cash flow, a concept that will be discussed later on. It is a tired cliché, but cash really is king, and it is the ability of a company to generate a strong cash flow that makes it an attractive investment.

In the United States, which represents over 50% of the world's market capitalization, companies are watched over by the SEC (Securities and Exchange Commission) and governed by the GAAP (Generally Accepted Accounting Principles), with strict rules governing the publication of financial statements. In particular, the two key financial statements are the 10-k and the 10-q. The *10-k* is the company's annual publication that is audited by external accountants and included in the annual report; the *10-Q* is released on a quarterly basis, and is not subject to auditing. Both of them, in addition to containing the three main financial statements, also include dozens of footnotes and fine print that can provide an extraordinary detail of insight to the investor trained in accounting. Companies are also required to release numerous other forms, such as the 8-k to announce major events, a form 144 for the trading patterns of insiders or the Schedule 13s if someone acquires more than 5% of a public company, to name but a few.

## ***The Balance Sheet***

The *balance sheet*, as alluded to above, contains a snapshot of a company's financial position at a moment in time. It shows a company's net financial position, in terms of assets, liabilities, and equity. A balance sheet does not necessarily "value" a company, since assets and liabilities are shown at "historical cost" and some intangible assets (e.g. brands, quality of management, market leadership) are not included. Assets and liabilities are divided into current and non-current, depending on if they will have an impact on cash within a year. The other element is shareholder's equity, which is the value of the firm's assets minus the value of the firm's liabilities according to GAAP accounting. This concept, book value of equity, will be used in some valuation methods.

Assets are listed in order of liquidity, with cash and marketable securities at the top. Other current assets include marketable securities, inventories and accounts receivables. Non current assets can include Property, Plant and Equipment (PPE) which shows the total book value of all the long living assets and property of a company, with the amount of depreciation and amortization in a sub account (often called a contra account). Other long term assets can include long term investments, goodwill, intangibles and the ubiquitous 'other assets'. Goodwill is an interesting concept to touch on briefly. It represents the premium that is paid when the company takes over another company (ostensibly, in order to acquire another company, you must pay a 'premium' over the market value of the company). Previously, this 'goodwill' used to be amortized much in the same way that a building is depreciated; however, in recent accounting developments, it is no longer depreciated, but instead regularly 'tested for impairment' – this is the way that it is written down. One should also take heed of 'other assets' – this is a bucket of weird assets that don't fit into the other categories, or that the company does not to provide more information about; one can examine the footnotes to try to get a better understanding of its contents, but sometimes, even this isn't clear.

Current liabilities include accounts payable and the amount of debt due in the next year (current portion of long term debt) to name but two. Non current liabilities include the remaining long term

debt, minority interests and other forms of debt, such as convertible debt, mortgages, deferred taxes etc. Minority Interests are an oddball, as they represent ownership in another company that is less than 50% of total ownership, and is not an obligation in the normal sense of the word.

## ***Income Statement***

The income statement tells the story of a company's financial performance over time, and shows the amount of profit reported by the company under the rules of GAAP<sup>9</sup> accounting. This gives one measure of the earning power of the company. In a simple income statement, revenues are what the company receives from selling its product or services. One subtracts COGS (the cost of goods sold) to find the gross margin. By subtracting SG&A (Selling, General and Administrative expenses), R&D (research and development), one arrives at EBITDA, which is Earnings Before Interest, Taxes, Depreciation and Amortization. It follows that by subtracting out depreciation and amortization, one arrives at EBIT, which is also termed operating income. To get to net income, one subtracts taxes (a necessary evil that we are familiar with on a personal level) and minority interests (which represents income earned by other companies that our current company owns less than 50% of), we reach net income; which may also be accompanied by 'extraordinary' items, which, apart from generally being one time items, are quite often extraordinary in nature.

## ***Statement of Cash Flows***

The statement of cash flows, like the balance sheet, shows a company's financial performance over time. The difference between the statement of cash flows and the income statement lies in the difference between cash and accrual based accounting as discussed above. It is possible to construct a cash flow statement for a company using only the balance sheet and income statement. In fact, this is an excellent exercise to attempt. It will take a lot of time at first, but it will also help you to understand how the different financial statements are related.

There are three types of cash flows on the cash flow statement. *Cash flow from operations* is the cash flow generated by the operations of the business. *Cash flow from investing* is the cash flow from investments the firm makes, ranging from stocks to simple purchases of property and plant. This number is negative if investment is positive because it represents a cash outflow. Finally, there is *cash flow from financing*, which shows how a company is financed. Issuances of stock and bonds, as well as taking loans will be shown here as a positive cash flow. Also, dividends are a negative cash flow, and are categorized as a financing cash flow because they are compensation to equity holders, and thus represent a form of financing.

## ***Footnotes:***

The footnotes contain a lot of important information that most people overlook. It includes key information such as any off balance arrangements (such as operating leases), the difference between the actual taxes paid and reported taxes, breakdown of assets into real estate versus facilities and executive compensation, to name but a few. These are all very useful tidbits of information that one can use to better value a company. For example, operating leases are a form of off-balance sheet debt which do not appear as debt on the balance sheet, and often provides debt financing at a lower cost. In the US, there can be a huge difference between how much a company really pays in taxes and how much they report for tax purposes, through various provisions such as Net Operating Loss Carryforwards, Alternative Minimum Tax and so on. Generally, real estate appreciates over time; it

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<sup>9</sup> Generally Accepted Accounting Principles (United States)

is still carried at cost on the balance sheet, so one can look in the footnotes to better determine the liquidation value of a company's assets. Although briefly touched on here, the footnotes are probably the most important section of the SEC filing, as all the details that most people don't know about lie here.

## Chapter III: Valuation

### ***An Overview:***

How much is a security worth? In economics, you will generally learn that the equilibrium price is the intersection of the supply and the demand curves. But consider the following: the market for \$20 bills. No one would pay more than \$20 to buy a \$20 bill, and no one would sell one for less than \$20. In fact, the supply and demand curves are horizontal lines on top of each other. Does the same analogy apply to securities? In the long run, one would tend to agree with this, but all types of strange things can happen in the short run. The result is that price differs from intrinsic value, where intrinsic value is defined as what a security is actually worth, based on the future cash flows which it is expected to generate. In the case of the dot com craze, the actual stocks were paying little or no dividends, and many companies were not generating positive cash flow – in other words, very little intrinsic value in a stock. However, investors were willing to pay exorbitant amounts for these dot com stocks and as a result, the market valuation, determined by supply and demand curves, resulted in much higher valuations than the intrinsic value of such stocks would suggest. In IAG, we use a variety of valuation methods, such as the *discounted cash flow* (DCF) valuation, which is obtained by discounting future cash flows to arrive at a present value which represents the intrinsic value of the security. We also make use of market valuations which compares a target firm's multiples to similar companies. There are a number of other methods that we use sparingly, such as option valuation, shareholder value-add approaches and sum of parts valuation. In practice, a lot of Wall Street analysts use comparative valuations, but there is also a widespread use of DCF analysis and other valuation metrics.

### ***Discounted Cash Flow Valuation***

The fundamental concept behind a DCF is pretty simple and self explanatory – discount the future cash flows that you expect to receive at the appropriate discount rate to arrive at a present value – this is your justified security price. In practice, however, it can be quite tricky to determine what to discount, how much to discount it by, and how it changes over time.

One may be tempted to discount net income, but we must remember that net income is an accounting measure, not a cash measure, and hence includes non cash charges such as depreciation and non cash revenues such as accounts receivables; it can be easily manipulated. Another thing we could use is the operating cash flow to the firm; however, this excludes certain capital expenditures and working capital requirements that are required to keep the firm operational and growing.

Usually, we use a measure known as the *free cash flow to the firm* (FCFF), but free cash flow to equity (FCFE) is also common. The FCFF is the cash distributions available to both the equity holders and the debt holders of the firm after all necessary reinvestments have been made to keep the firm operational and growing. It is loosely defined as EBIT plus depreciation less capital expenditures less net working capital less taxes.

Now that we know what we are discounting, we must determine an appropriate discount rate. In this case, we discount the FCFF with the Weighted Average Cost of Capital (“WACC”). Because FCFF deals with both debt holders and equity holders, we must determine a discount rate that not only incorporates the discount rates for both debt holders and equity holders, but also the correct proportion of each as a percentage of total enterprise value (such that if the corporation was financed with 75% debt and 25% of equity, the WACC would be 75% \* discount rate of debt holders + 25% \* discount rate of equity holders. What are these respective discount rates for the debt and equity holders? Discount rates are primarily a function of risk, and so the higher the risk, the higher the discount rate.

Because debt holders are senior to equity holders (if the firm goes bankrupt, the debt holders will get paid first), they are lower risk, and hence have a lower discount rate. There are a number of ways that we can arrive at the discount rate for debt holders, which is better known as the cost of debt. Ideally, if the company has bonds that trade on the open market, we can assume that the market prices the risk efficiently, and look at the yield to maturity as a cost of debt.

However, since it is only the largest companies that have a big market for the bonds, we will most often not have this data. Bearing in mind that the cost of debt is primarily driven by the chance that the company defaults, a lot of the work of calculating discount rates is done for us by credit rating agency’s – the big three being Standard and Poors, Moody’s and Fitch Ratings. We can compare a company’s credit rating with default probabilities and look up a corresponding cost of debt which is based on the risk free rate plus the spread for the particular credit rating.

If the firm is so small that not even the credit rating agencies look at it, we are forced to estimate how likely the firm is to meet its debt obligations, and generally look at ratios such as EBIT / Interest, EBITDA / Interest and FCFF / Interest to create an estimated credit rating, which we can then turn into a discount rate using the above methods. The idea behind these methods is that the risks of a company’s debt is affected by its ability to pay interest. Higher EBITDA, EBIT, or FCFF coverage ratios imply a greater ability to pay interest and a greater margin of safety in years when a company does not perform as well. It is also interesting to note that there is not a great difference in the cost of debt for investment grade companies – that is, companies which are rated BBB or higher by Standard and Poors, or Baa by Moody’s. There is a big jump, however, when a company’s rating drops below investment grade to ‘high yield’ or ‘junk’ status to BB (S&P’s) or Ba (Moody’s). This occurs because the greater inherent risk in lower grade bonds increases the volatility of bonds in these markets.

The discount rate for equity holders, also known as ‘the cost of equity’, is a bit harder to calculate, and we use a model known as the *Capital Asset Pricing Model* (“CAPM”) to determine it. The CAPM is based off an ordinary least squares regression and denoted by the following equation

$$R_e = R_f + \text{Beta} * (\text{Risk Premium}).$$

The underlying theory is that there are two types of risk that equity holders face – firm specific risk, which is unique to the firm and cannot be avoided (unless, of course, you do not invest in the firm in the first place) and market risk, which can be diversified away. Under the assumptions that there are no transaction costs, that all assets are traded, the markets are efficient and that investors hold diversified portfolios (aka the ‘market portfolio’), we can measure the risk that any security adds to the market portfolio by its *beta* – in other words, how much ‘market risk’ is added. If the price

movements of a security are unrelated to the market, the stock deserves a beta of 0; if it moves a lot with the market (i.e. is very cyclical), it will deserve a high beta. As a result, cyclical companies such as tech companies have much higher betas than some food companies. Betas can be determined in a number of ways: one way is by conducting a linear regression of the security's monthly returns over the last 5 years with the markets returns. The market can generally be represented by the S&P 500, by the Wilshire 5000 (the largest index of stocks), or Russell 2000 (small cap stocks only), to name but a few benchmarks. Monthly data over 5 years is used as monthly data is not too short to be unduly affected by random price jumps, but frequent enough to provide enough data points to make the regression meaningful. However, this method is prone to certain errors – for example, a company in distress will have a declining stock price unrelated to the general market, resulting in a beta of 0 and the assumption that the security adds no additional risk; where in reality, it is easy to see that it is a very risky proposition after all!

To overcome this problem, we can take a built up beta approach and look at the calculated betas of similar companies. We would expect that these similar companies face similar risks, and that stocks in one industry tend to move in the same general direction. We can compare these betas unlevering them to take into account different leverage and capital structure by the following formula, which gives us the beta if the firm had no debt (adding debt, also known as leverage, raises the beta as it 'magnifies' the risk and return of the unlevered investment)

We can take an average of the betas of the unlevered comparable companies to use as the unlevered beta for the company we are trying to value, and use the above formula in reverse to relever the beta.

To briefly elaborate on the components of the CAPM formula, the risk free rate is the return earned on the asset with the least risk, and is generally one of the treasury bonds issued by the US government for the case of US companies. The risk premium is sometimes written as  $R_m - R_f$ , and denotes the premium demanded by investors for investing in the market portfolio versus the riskless security. We generally use the geometric monthly average returns of the US stock market over the returns of the 10 year government bond.

Now that we know what we are discounting, and what we are discounting it by, there is only one more piece in the puzzle. How does the FCFF change over time? Given that firms generally grow, it seems that using today's FCFF repeatedly would undervalue a company drastically. On the other hand, if the growth rate is greater than our discount rate, we will have an infinite stock price. It has been observed that a firms' growth slows down as it becomes older, more established company and this is what we use in a DCF. In many DCF valuations, there is a hypergrowth stage where the growth is greater than the WACC and ultimately a terminal stage, where growth is a stable, constant number that is lower than the WACC. The numbers that comprise the FCFF also change as well; just as sales rises, so would the costs of goods sold, for example. The most straightforward approach is known as a top line approach, where other line items are measured as a percentage of sales. We make assumptions about how these margins change over time, and then grow out the FCFF indefinitely. Ultimately, as growth tapers off, we are left with a situation where we can assume that a firm will grow at a fixed rate for the rest of its life (this rate is often the rate that the economy is growing adjusted for inflation). There are two approaches that can be taken here; one can either use the perpetuity formula that will essentially find the present values of the FCFF extended indefinitely with the given growth and discount rates (and the discount rate must be greater than the growth rate), or one can use a terminal multiple. The terminal multiple, generally

based of EBITDA, is the multiple that similar firms are trading at, which leads us right on to our next valuation method: relative valuation.

## ***Relative Valuation***

The key concept behind a relative valuation is the ‘law of one price’ – two identical securities should trade for the same price. By extending this one step further, we can claim that similar companies – with similar risks, operating, financial and business characteristics should trade at similar ‘prices’ (bearing in mind that ‘prices’ here does not mean stock price, which is affected by the number of shares outstanding; rather, we are talking in terms of overall market valuation). The key advantages of a relative valuation over a DCF are that there are fewer explicit assumptions in the relative valuation, and that it is much easier to understand and present to others than a DCF. Furthermore, a relative valuation is more likely to reflect the current opinion of the market. In particular, there are two questions to ask in a relative valuation: what metrics do I compare, and against whom do I compare these metrics?

In a relative valuation, we often use ‘multiples’ as the basis for comparison. Broadly speaking, multiples fall into two categories: equity specific multiples (such as Equity to X or Price to X) and Firmwide multiples (Enterprise Value to Y). The idea here is matching apples to apples, not to oranges; if the numerator of the multiple is an equity value, then the denominator must have an equity value such as net income, earnings per share, etc. Similarly, a Firmwide numerator should have a Firmwide denominator, such as Sales, EBITDA, etc. As a general rule, if the denominator is a line item that is before interest payments, it is a Firmwide value; if it is after interest payments, it is an equity value. One other thing to note is that multiples must be consistently defined between different companies. One of the most popular multiples is the price earnings one, although that can have a variety of meanings. Are earnings on a diluted or an undiluted basis (taking into account convertible debt, executive stock compensation, employee stock option plans, etc); is it based on last fiscal year’s earnings, or the last 12 months of earnings, or the expected earnings over the next 12 months. The P/E ratio is a very popular measure and is commonly used; however, it also is very limited in its usefulness. Another question is does the P/E multiple incorporate extraordinary items or leave them out? A major shortcoming is it ignores capital structure and the amount of debt a company has, which is why an Enterprise Value to EBITDA multiple is often more useful. At the end of the day, we are trying to standardize multiples to fit our law of one prices model, and although the different multiples definitions tell us slightly different things, in order for them to be of any use, we must be comparing apples to apples. Certain industries are characterized by certain multiples – for example, financial institutions tend to be valued on a price / book value basis.

The second part of a relative valuation is to find similar companies. Just what is a comparable firm? Ideally, it will be one with similar cash flows, growth potentials, risk, etc to our target firm. This will generally mean that it will be of similar size, in the same industry, in the same country with the same capital structure and so on. Sometimes, especially when monopolies or conglomerates exist, it may be hard to find similar companies. Consider the Marriot Corporation (“MAR”): it has three key divisions - hotel lodging, restaurants and contract services. In this case, we can run a relative valuation on each of the separate divisions and aggregate them to find a total value for Marriot. The difficulty here is breaking up Marriot into its individual divisions (which can be pro rated on revenues, on earnings, etc) and the fact that we ignore any synergies that may exist from having the different divisions under one company. Another difficulty occurs when we are trying to value a monopoly – such as Boeing (“BA”), which has no direct competitor in the United States. It is

possible to compare Boeing to Airbus, a European company, but one must pay special attention to differences in accounting regulations when looking at certain multiples. The biggest problem occurs when there is no similar company in the rest of the world – such as Microsoft. Here, it is better to use alternate valuation techniques.

### **Alternate Valuation Methods**

There are a number of alternative valuation methods that IAG uses sparingly. One popular method revolves around *economic value added* (“EVA”), which was popularized by Stern Stewart and has since been adopted by firms such as McKinsey and Morgan Stanley. This method of valuation is also known as “Economic Profit,” and the idea behind it is based on the old economic principle of opportunity cost. To calculate EVA, we first need to calculate our return on capital, which we compare with our WACC value as follows:

$$\text{EVA} = (\text{ROIC} - \text{WACC}) * \text{Total Capital}$$

Using EVA to value a company is similar to using discounted cash flow valuation. Instead of discounting future FCFF values, we discount EVA and then add the current value of our total capital to this in order to get a value for the firm. In theory, this should give the same result as a FCFF valuation.

Another variant of EVA called Cash Flow Return on Investment (“CFROI”), was patented by the Holt Value Associates, since acquired by Credit Suisse First Boston. It is essentially EVA on a cash flow basis that reflects the current asset base and is adjusted for inflation. CFROI is based more directly on the concept of IRR, and it tries to value a firm based on its current investments, estimated future investments, and the rate of return which the firm can expect on these investments. The CFROI makes heavy use of returns on capital which fade towards industry and universal averages.

One problem with all of the above mentioned valuation techniques are the assumption that all of the assets are fully utilized. However, it is not uncommon, especially during economic downturns for factories, etc, to be underutilized. One method that can be used to address this problem is option valuation. In the case that some assets derive their values not from the cash flows that they currently generate or from highly valued comparables, but rather from a potential that they possess to be valuable in the future contingent on some other events, we should use option valuation. This can be done when a company has a choice of delaying a project that is about to be undertaken, or the value of a firm’s patents, or even the natural resources such as oil reserves. The actual methodologies for option valuation are beyond the scope of this guide but are based upon the binomial asset pricing model in discrete time and the Black Scholes model in continuous time.

## **Chapter IV: Understanding Company Analysis**

So far, you have learned a significant amount about finance and about how to value a company using their financial information. However, at the end of the day, the most important thing is to thoroughly understand the company. Only by knowing the company and industry inside out will you be able to make solid projects and assumptions. There are a number of useful tools that we use to evaluate competitive landscape.

## **Porter's Five Forces**

One of the most basic ways to analyze a company and its prospects is by using the Porter's Five Forces model, developed by Michael Porter at the Harvard Business School. This model is used to evaluate the competitive landscape that a company faces.

*Intra-Industry Competition:* This one is pretty straightforward. The most obvious consideration is the number of firms that are in the industry, and the more firms that are in the industry, the greater the degree of intra-industry competition. Another consideration is the degree to which design of the product is standardized. Products which are commodity products, such as a computer, will generally involve greater levels of intra-industry competition, than products which are more unique or customizable, such as luxury goods. Legal rulings can also affect the intra industry competition – for example, in the pharmaceutical industry, new products can be patented and copyrighted which prevents competition. It can also work the other way too – Ma Bell was split into AT&T and seven other regional holding companies, and more recently, Microsoft survived a court ruling that would have made it split into smaller corporations.

*Threat of New Entrants:* This aspect of the model deals with the possibility that a new competitor will enter the fray, whether it is an existing company in a related industry expanding into the industry or a new start-up. One barrier to entry is high start-up costs, such as the need for a great deal of capital expenditures. An example is the automotive industry with its massive factories. Another barrier to entry is government regulation, where the government restricts the ability of new companies to enter the industry, or gives local monopolies to certain companies. A final example is intellectual property and brainpower. A company can either have patents which protect it from competition, or it may simply have a substantial amount of knowledge which would be difficult to replicate by a competitor.

*Supplier Bargaining Power:* Can the company choose the price it pays for certain supplies, or do the suppliers set the prices? The larger the company, the greater the degree of leverage it has over its suppliers, and thus the lower the bargaining power of suppliers. An example is Wal-Mart, which regularly delays payments to suppliers and uses its massive purchasing power to not only lower the prices it pays for products but also to negotiate on its own terms. Another consideration is the number of companies in the industry we are dealing with. The more companies in an industry, the more options suppliers have, and thus their bargaining power is greater. Similarly, the number of suppliers is also an important factor - an increase in the number of suppliers gives a company more options and hence a greater degree of bargaining power. Finally, there is the nature of the supplier's product and how commoditized or specialized it is. The more specialized the product is, the higher the degree of supplier bargaining power.

*Buyer Bargaining Power:* This has to do with the ability of a company to set prices for its customers. As has been discussed before, a commodity product gives buyers a higher degree of bargaining power as it is easier to find someone else to produce it. The more companies in an industry, the greater the buyer bargaining power is as buyers now have more options. Another consideration is the size of one's customers. A large retailer, for example, has much greater bargaining power than a single individual who is looking to make a purchase.

*Threat of Substitutes:* How easy is it to find a substitute for a product? Generally, if a product is narrower in scope, it is easier to find a substitute. For example, consider the food industry. If we are looking at something broad such as food, there are no substitutes. As we narrow it down and come

to something like potato chips, we start to see more substitutes. Corn chips, popcorn, pretzels and other snack foods come to mind. If we come to something specific, such as Pringle's barbecue flavored potato chips, substitutes become even easier to find. Another way of looking at this is if products are more important, they are harder to find substitutes for. Internet access is something which most of us see as very important, and which it would be hard to find a replacement for. A land line telephone on the other hand can be replaced more readily. Cellular phones are an easy replacement.

## ***SWOT Analysis***

SWOT analysis is simply a way of looking at analyzing a company through using a matrix to evaluate its viability or to suggest a strategy for the company. *SWOT* stands for strengths, weaknesses, opportunities, and threats, each term being fairly self-explanatory. It helps to think of Strengths and Weaknesses as being an analysis of the company by itself, and Opportunities and Threats as putting the company in the bigger picture, as part of an industry or the economy as a whole.

## ***Other Elements to Consider***

One important determinant of growth is saturation. To take an easy example, let us look at a company such as Starbucks ("SBUX"). Here is a company whose opportunities for growth are rather limited compared with a smaller company. In Manhattan, for example, there are many Starbucks stores within a five minute walk of each other, and there gets to be a point where adding more stores will not increase sales sufficiently to be cost effective. As far as Manhattan is concerned, Starbucks has reached a saturation point as opening new stores will most likely cannibalize sales from existing stores – however, this may not be the seem for China, where Starbucks still has a lot of room to grow.

Something else to consider with growth is where a company's growth comes from. Does it come from increasing sales using its existing locations, or does it come from capital expenditures and building new stores? A company which can grow with less new investment is worth more than a company which requires more investment to achieve growth.

Besides sales growth, we must also look at profit margins. Many financial models are known as 'top down' models – where the key drivers are the growth rate in sales, and other line items based as a percentage of sales. As a company goes forward, it is necessary to determine whether profit margins will stay the same, increase, or decrease. One way to do this is to look at what profit margins of more mature companies in the industry; one would expect that in the long run, we will see mean reversion and all companies revert to industry average margins. Another way is to look at what long run cost-cutting measures a company has. Economies of scale are something to look for as well, as fixed costs are distributed over greater production to reduce per unit costs.

We should look also at a company's business model and plans and evaluate them on our own to determine if we think they are viable. Certain companies are very well run and good management of these companies ensures their continued success. Other companies are poorly run and are unlikely to achieve their goals due to a lack of management talent. So, analysis of business models and also an evaluation of the competence of a company's management and employees are a necessary step.

One final area to consider is demographics and social values. If a company targets most of its sales to younger individuals, it is important to predict what the number of individuals of a certain age will be over time, as this is a key ingredient in evaluating a company's future sales potential. Social values are also important. If there were to become a trend for families to revert to having longer sit down dinners with everyone present, we might expect fast food sales to decline as fast food seems less appropriate for a family which wants to sit down for dinner together.

## **Conclusion**

This guide has given you a brief outline of some of the major concepts and tools that you will need to understand to benefit the most from your IAG experience. Additionally, much of your Stern education will revolve around these principles and you will hopefully find that IAG develops a greater understanding of these concepts and ties them altogether so that you will make the absolute most of your Stern education.