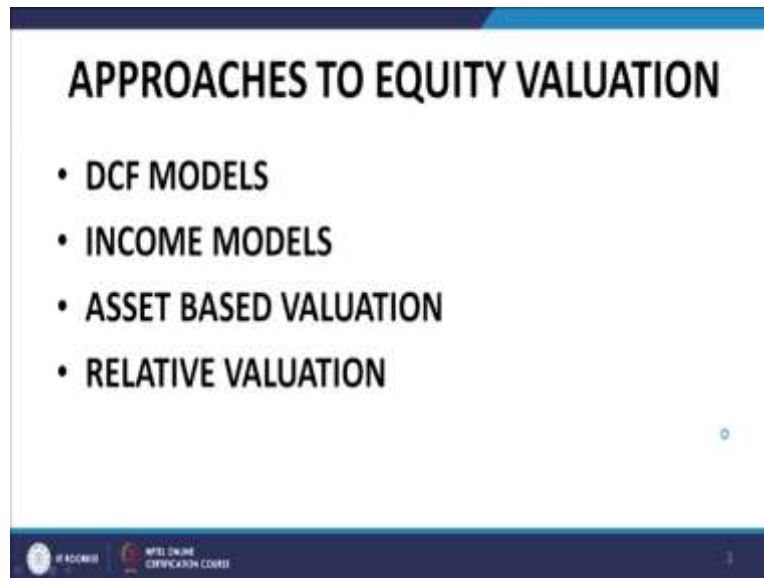


Security Analysis & Portfolio Management
Professor J.P. Singh
Department of Management Studies
Indian Institute of Technology, Roorkee
Lecture 33
Fundamental Analysis

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Welcome back. So, let us continue from where we left off. Before we do that quick recap as usual. The various approaches to equity valuation which are commonly used either individually or in combination are the DCF models, the income-based model, the asset-based models and relative valuation.

Of course, we also have the option-based model, but that we will talk about later on when we go to the derivative segment of this course. So, as far as the DCF models are concerned, there are four variants of this model. We have the enterprise DCF, where we discount the free cash flows to the firm on the basis of the weighted average cost of capital post-tax weighted average cost of capital.

The post-tax effect captures the impact of the interest tax shield. And then we are the equity cash flow model where we discount the free cash flows to equity, that is the cash flows that are left over for the residual cash flows that are left over for distribution to the equity shareholders and we discount them at the levered cost of equity that is the risk adjusted cost of equity.

Then, we had the adjusted present value method where we separated out the impact of debt or the value addition due to debt, we value the firm as an unlevered firm, we calculate the free cash flows accordingly, and we discount them at the unlevered cost of equity. And then we

use a discretionary rate to discount the interest tax shields and add that valuation to the value of the unlevered firm to arrive at the value of the levered firm.

Then we finally have the capital cashflow model, which is in some sense a variant of the adjusted present value method where we account for the interest tax shields explicitly in the numerator while calculating the free cash flows and then we discount these cash flows that is the free cash flow to the firm plus the interest tax shields is at the pre-tax weighted average cost of capital.

So, the impact of taxation is captured in the numerator in this case, whereas, in the case of enterprise DCF, the impact of taxation is captured in the denominator. That makes the valuation consistent. Then we moved over to the income-based approaches. We have in line with the free cash flows to the firm approach or the enterprise DCF approach and the free cash flows to the equity or the equity approach.

We have the economic profit approach, which is parallel to what we have in the case of the free cash flows to the firm. And we have the residual income approach which is parallel to the equity-based valuation, the direct equity valuation. As mentioned, the economic profit, as well as the free cash flow the enterprise DCF model gives us the value of equity indirectly by deducting the value of debt from the value of the firm. Whereas, the residual value method or the equity cash flow approach gives us the value of equity directly.

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$$V_0 = IC_0 + \sum_{t=1}^{\infty} \frac{EP_t}{(1+k_w)^t}$$

$$V_0^{\text{Equity}} = E_0 + \sum_{t=1}^{\infty} \frac{RI_t}{(1+k_e)^t}$$



The formula for the two income-based approaches that I elucidated just now is given on this slide. We start with the initial t equal to 0 that is the point at which you are doing the

valuation, we are initiating the valuation invested capital that is the sum of the fixed asset, net fixed assets and current asset, net current assets on the, at the point at which the valuation commences, valuation period commences, and then we add to it the present value or the discounted value of profit, which is (4:06) surplus profit we will come back to it.

The present value or the discounted profit of economic profit, the discount rate used during the post-tax cost of capital. And then we have the equity valuation model or the residual income valuation model where we start with the book value of equity and add to it the present value of all future residual income discounted or delivered cost of equity.

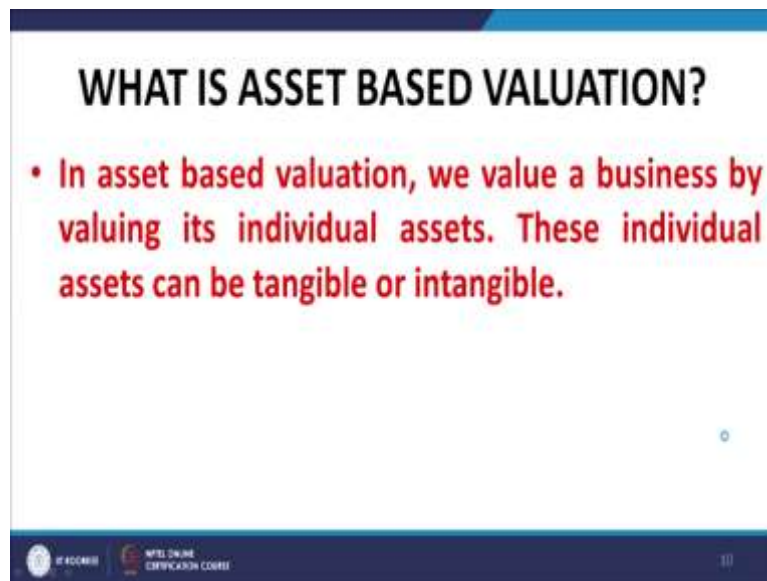
Now economic, these are the definitions, economic profit is defined as NOPLAT minus capital charge where NOPLAT is EBIT minus taxes on EBIT, EBIT is profit before tax plus interest minus non-operating income. So, when we talk about EBIT as I emphasized earlier also you are talking about the income from the regular operations of the business, taxes on EBIT. We have a provision for taxation plus interest tax shield minus taxes on all operating income.

So, because we are excluding non-operating income, we need to exclude the impact of taxation on non-operating income here as well. Again, we need to look back at the issue of consistency and compatibility. NOPLAT may also be defined as the return on invested capital into the opening balance of invested capital.

Capital charge is defined as WACC post-tax into invested capital opening balance, invested capital, I mentioned earlier, is the net operating assets that is net fixed assets plus net working capital. Residual income is defined, as the surplus income available to equity shareholders that is net income minus equity charge. Please note, this net income is before dividend, so dividend is proxied by the equity charge. So, it is net income minus equity charge.

Net income is the return on equity into the opening balance book value of equity and equity charge is equal to the cost of equity which is the required return for equity shareholders. Please note, this is in substitution of the dividend, so cost of equity into equity capital the opening balance of equity capital the book balance of equity capital. So, this is what is residual income. Then we moved over to asset-based valuation.

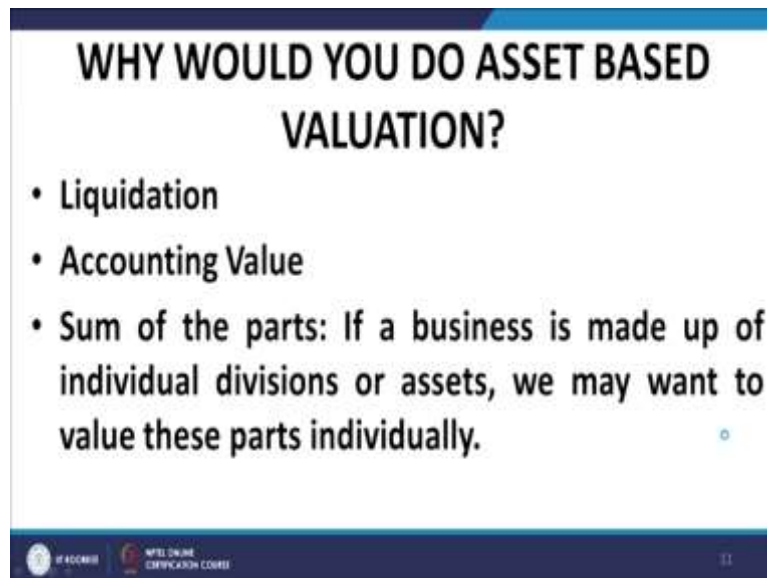
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WHAT IS ASSET BASED VALUATION?

- In asset based valuation, we value a business by valuing its individual assets. These individual assets can be tangible or intangible.

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WHY WOULD YOU DO ASSET BASED VALUATION?

- Liquidation
- Accounting Value
- Sum of the parts: If a business is made up of individual divisions or assets, we may want to value these parts individually.

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In asset-based valuation, we value a business by valuing its individual assets. These individual assets can be, both, tangible as well as intangible. Asset-based valuation is appropriate, when we are looking at a liquidation valuation of the firm or we are working out trying to work out the accounting value of the firm in line with the requirements of the accounting standards, which have made a paradigm shift to the fair value framework, fair value accounting in substitution of to some extent or a significant extent of historical cost accounting.

Then this asset-based valuation is also useful when we talk about valuations of some of the parts. If a business is made up of individual divisions, you can value each of these divisions

separately and then aggregate all these valuations to arrive at the value of the business. The asset-based valuation can again be done on the basis of intrinsic valuation, asset wise.

For each asset, you work out the intrinsic value of that asset or you work out the relative value of that particular asset or you go on the basis of book value of that asset. So, these are three options that are available, when we are looking at the asset-based valuation of a business.

Now, relative valuation. Well, relative valuation is in a sense you compare the value of similar assets in the market, and then you use that as a benchmark for valuing the business or the assets that you are talking about. So, in relative valuation, the value of an asset is compared to the values assessed by the market for similar or comparable assets.

However, you need to follow a proper methodology for doing relative valuation as well, otherwise, there is liable to be a distortion in the valuation. So, first of all, you need to have a collection of comparable companies, comparable assets, and then obtain market values of those assets.

Market value, for example, if you are valuing shares, you need to have the market prices of those shares of the comparable companies that you have already identified under step 1. Then you need to compare these market valuations of these shares or other assets as the case may be into standardized values. Because each company is going to have singularities, therefore, it is not possible, not practicable or not correct, really, to arrive or to use the prices straight away.

You need to, for example, if you are comparing the prices of houses or you want to value a particular house, you cannot straightaway compare the prices of various houses in the neighborhood, it is better that you do, you arrive at the house cost per unit area, and then, use that multiple of the house cost per unit area for valuing the house that you are targeting.

So, that is the essence of the issue. The issue is that you have the market prices of the shares, but you need to have a standardized market price per unit of some by some parameters, some attribute of the company. For example, the earnings or the book value, as the case may be. So that is the called standardization. We standardize the prices with respect to certain realizations, certain recoveries that you would make from investing in those assets. For example, the earnings of the company or the book value of the company, these are common multiples.

Then we need to do take up some kind of, it is, before we start taking averages, it is more appropriate that we prepare some kind of a statistical distribution of these standardized values to arrive at and identify outliers and properly account for them. Outrightly excluding outliers or putting a cap is likely to distort the averages, and therefore, it is appropriate that we study those outliers and then take an appropriate decision on how to deal with them.

And then the next step would be that you take some kind of an average of these standard multiples over the comparable set, after accounting for adjusting for the outliers. Then you compare the standardized value on multiple of these assets being analyzed to the average standardized value of comparable assets.

So, then you compare these standards. For example, if you have a price earnings ratio of the target company, you can compare it with the or average of the price earnings ratio of the set of comparable companies after accounting for or after adjusting for outliers in an appropriate manner. And then before you finally arrive at a decision, you should also take account of the possibility of there being differences between the firms that you have in your comparable set and the target firm.

You need to look at that very closely. You need to look at the drivers of value that go into the multiple. For example, the price earning multiple is driven by growth rates, is driven by the return on equity and the required return by the shareholders. So, these are some of the factors in the risk of the company, as well. These are some of the factors, which would go into determining the price earnings multiples.

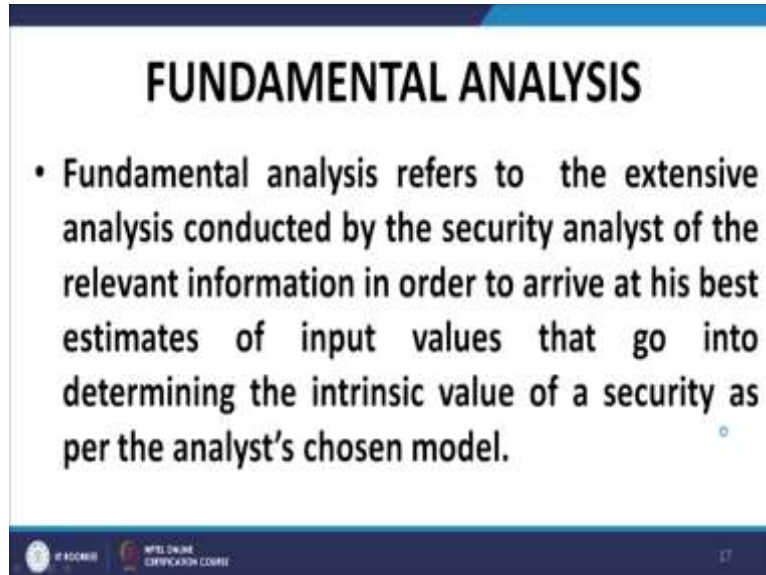
So, before you can compare the price earnings ratio of your company, the target company with the standardized values, you need to consider differences in these parameters in these attributes and account for them to arrive at a final decision as to the underpricing or over pricing of the target company. Now we come to a new topic. This is fundamental analysis.

So, far, what I summarized, just now have been the methods, the approaches that are used for the valuation of equity shareholders. We now move on to the determination of the approaches to the determination of the inputs that go into these kind of valuations. So, that is done through a concept, which is collectively termed to be fundamental analysis. So, let us first look at the definition of fundamental analysis.

Fundamental analysis refers to the extensive analysis conducted by the security analyst of the relevant information in order to arrive at his best estimates of input values that go into

determining the intrinsic value for security, as per the analysts chosen model. Let me repeat, this is a very important definition.

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FUNDAMENTAL ANALYSIS

- Fundamental analysis refers to the extensive analysis conducted by the security analyst of the relevant information in order to arrive at his best estimates of input values that go into determining the intrinsic value of a security as per the analyst's chosen model.

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Fundamental analysis refers to the extensive analysis conducted by the security analyst of the relevant information. All information that is relevant to the determination of the inputs that go into the model for determining the value of the enterprise or the equity of a company. In order to arrive at his best estimates of input values that go into determining the intrinsic value for security, as per the analyst chosen model.

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TECHNICAL ANALYSIS

- Technical analysis is a trading discipline employed to evaluate investments and identify trading opportunities in price trends and patterns seen on charts.
- Technical analysts believe past trading activity and price changes of a security can be valuable indicators of the security's future price movements.

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You have to contrast the fundamental analysis with the technical analysis, which is another form of analysis. While the fundamental analysis is largely founded or largely based on the

analysis of the financials of the company over a sustained period of time, how the financials of the company have progressed, what are the salient features of the or the trends that are incorporated in the financial statements either explicitly or latently technical analysis believes that or is based on the maxim that history repeats itself.

And a technical analysis bases its analysis on the analysis of the various price patterns over the history of the firm over the trading of the stock of the firm. In other words, what patterns have been observed in the stock prices over a sustained period of time technical analysis goes into detail, into depth, into analyzing those patterns, those trends that are incorporated in the prices and on that basis, it tries to make an assessment of future prospects of the firm.

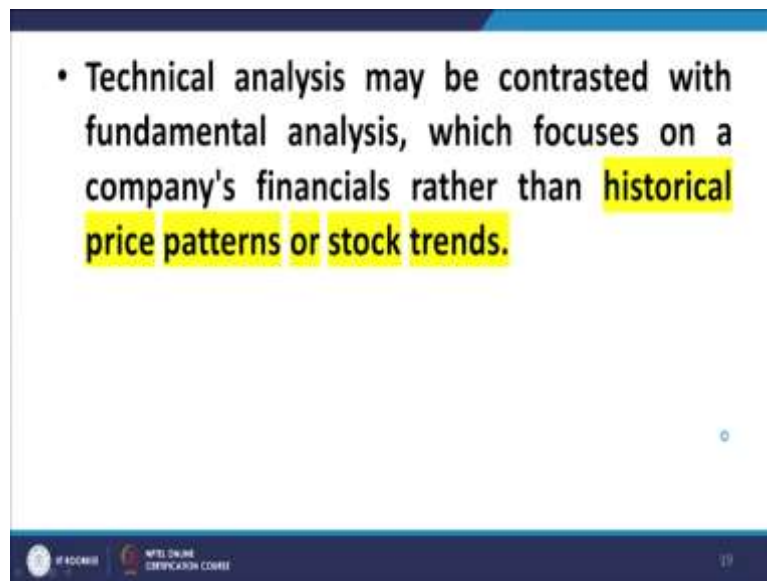
If a particular pattern reemerges, for example, the technical analysis charter would immediately react and base investment decision on the premise that once that pattern has reemerged, it would be followed by the subsequent pattern that has been emerged earlier. So, if in the earlier case, that particular pattern had been followed by a bullish activity, he would react that the future would also be bullish. So that is the perception of technical analysis. That is the assumption of technical analysis.

Let us get into it. Technical analysis is a trading discipline employed to evaluate investments and identify trading opportunities in price trends and patterns seen on charts. So, that is the important thing. You do not go into that, you do not go deep rooted into the financials of the company, what you do is that superficial analysis of the prices of the volumes and other singular features of the trading activity of a particular firm.

And on the basis of a study of those charts of prices, volumes and other features of trading activity you arrive at certain conclusions about the future behavior of prices. If a particular pattern is being repeated, like a candlestick pattern, you would react by taking by believing that following that candlestick pattern the prices would react in a particular manner, and thereafter, you would base your investment decisions on that premise.

So, technical analysts believe past trading activity and price changes of a security can be valuable indicators of the securities future price movement. This is the fundamental assumption underlying technical analysis. Technical analysis believe past trading activity and price changes of security can be valuable indicators of the securities, future price movements.

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So technical analysis may be contrasted with fundamental analysis just what I mentioned just now. Technical analysis may be contrasted with fundamental analysis, which focuses on a company's financial, the trends in the company's financials right from the base. Fundamental analysis analyzes the company through its annual reports, so the annual reports over a sustained period of time a number of years and then tries to identify trends hidden within the accounting information.

Whereas, a technical analysis is a superficial analysis, entirely superficial analysis that bases its conclusions on a study of the price patterns in the market, volume activity and other trading signals that are identified by the analyst on the basis of these patterns.

Components of fundamental analysis. Fundamental analysis is usually conducted through a three-pronged strategy. The EIC strategy it is commonly known as EIC strategy. And the EIC stands for the economy analysis, the industry analysis and finally the company analysis. Now, the approaches to fundamental analysis can be either a traditional top-down approach where you start with the economy and then zero-down on the company's financials or you can start it the other way around.

You can start with a bottom-up approach where you identify the company first, and on that basis, you try to relate it to the economy of the country or you can also have a combination of both which is the hybrid approach.

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TOP-DOWN APPROACH

- Top-down analysis begins with expectations about a macroeconomic variable, often the expected growth rate of nominal GDP.
- Revenue projections are derived from an estimate of GDP growth.
- For example, an expected relationship between GDP growth and company sales are an example of a top-down approach.

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So, in the top-down approach, the top-down analysis begins with expectations about a macroeconomic variable. For example, the expected growth rate of nominal gross domestic product GDP. Revenue projections of the company are derived on the basis of some kind of an association that the analyst is able to identify, is able to correlate between the revenue generations of the company that is proposed to be analyzed and the GDP of the country.

So, revenue projections are related to the GDP growth activity. The overall growth of the economy. For example, an expected relationship between GDP growth and a company's sales is an example of a top-down approach.

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BOTTOM-UP APPROACH

- Bottom-up analysis starts with analysis of an individual company or its reportable segments.
- Revenue projections based on historical revenue growth or a company's new product introductions over the forecast horizon are considered bottom-up approaches.

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Bottom-up approach, as I mentioned, starts in the reverse direction. It starts with analyzing an individual company or its reportable segments, and then revenue projections are based on historical revenue growth or a company's new product introductions over the forecast horizon and these kinds of approaches are considered bottom-up approaches.

So, in that top-down approach, you start with the economy, you start with a growth rate in GDP or some similar parameter. And on that basis, you try to correlate that these growth rates with the growth rates of the revenues of the firm by identifying some kind of an underlying relationship, some kind of a latent relationship between the two variables, the nation's GDP and the company's sales.

In the bottom-up approach, it is the other way around. You try to work out estimates of revenue based on the historical performance of the company itself. And if the company is launching a new product, you make estimates on the basis of the technical inputs that you get from the technical departments, and so on. Hybrid approach incorporates elements of both the top-down and a bottom-up approach as its name signifies.

By using elements of both methods, hybrid analysis can highlight any inconsistencies and assumptions between the top-down and the bottom-up. A hybrid analysis is the most common type of analysis that is commonly adopted. Economic analysis, now, this is the trends in macroeconomic variables. I shall be very brief on these segments of the course because they are not as I mentioned the mainstream of this particular course. However, we need to know a little bit about these things, when we are doing security analysis and that is the reason, I have put them in this presentation.

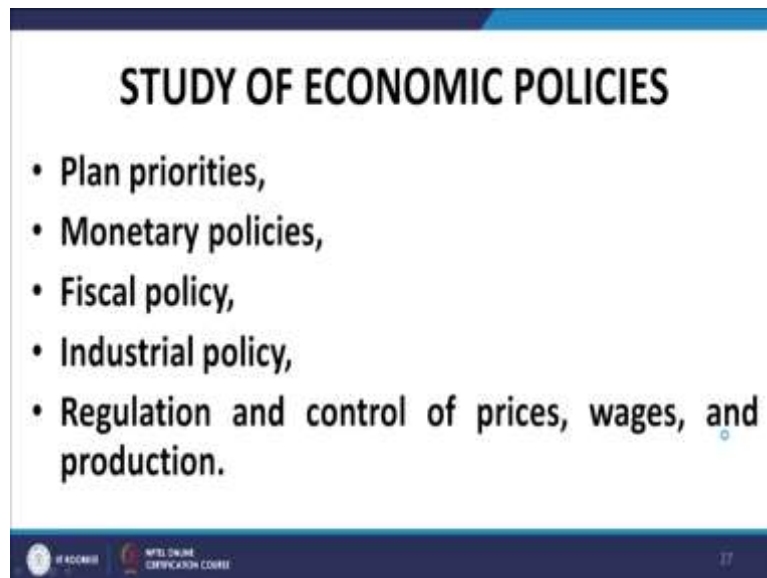
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TRENDS IN MACROECONOMIC VARIABLES

- Gross national product,
- Employment,
- Aggregate corporate profits,
- Personal disposable income,
- Balance of payment position,
- Inflation,
- Government spending,
- Money supply, etc.

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STUDY OF ECONOMIC POLICIES

- Plan priorities,
- Monetary policies,
- Fiscal policy,
- Industrial policy,
- Regulation and control of prices, wages, and production.

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So, trends in macroeconomics variables that need to be studied, that could shed insightful information on the valuation of securities, valuation of shares are the trends in gross domestic product, gross national product, employment statistics, aggregate corporate profits, personable, personal I am sorry, personal disposable income, balance of payments, position, inflation, government spending, money supply.

Then economic policies that need to be studied by the security analyst include plan priorities, monetary policies, fiscal policies, industrial policy, regulation and control of prices, wages and production. So, these are some of the important policies that need to be studied by the analyst and some of the macroeconomic variables that whose trends also need to be examined

by the analyst when forecasting or doing a fundamental analysis of the inputs for forecasting the price of a security.

Relationship between economic trends and policies also need to be studied by the analyst. And this analysis, the economic analysis need not be confined to the borders of the country. The domestic borders, you also need to have a feel of how the international economic environment is going to impact the economy of the country at the changes. Now important decisions that are taken at the international level, which are likely to impact the imports, exports, exchange rates, interest rates in our country also need to be examined.

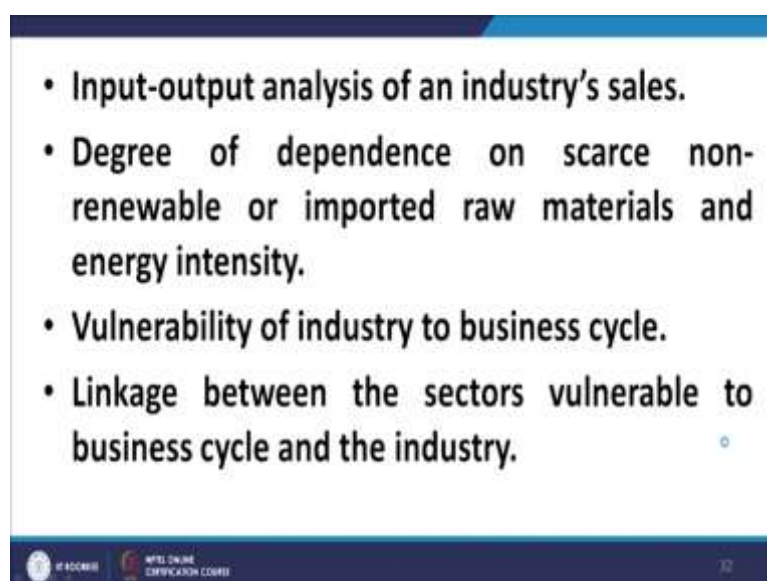
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INDUSTRY ANALYSIS: ILLUSTRATIVE

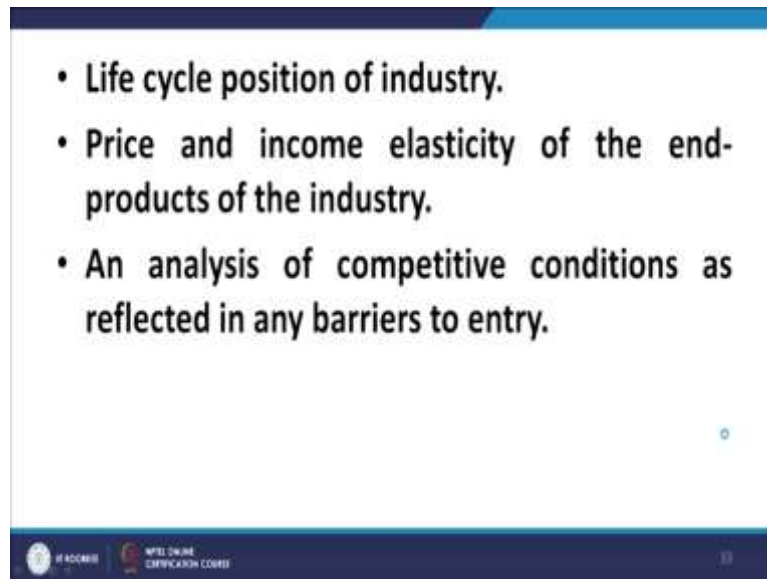
- Implications of projected growth in gross national product for relevant industries.
- Implications of plan priorities and plan expenditures for relevant industries.
- Vulnerability of industry under government regulation, and control of prices and production.
- Implications of industrial and fiscal policies of the government for an industry.

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- Input-output analysis of an industry's sales.
- Degree of dependence on scarce non-renewable or imported raw materials and energy intensity.
- Vulnerability of industry to business cycle.
- Linkage between the sectors vulnerable to business cycle and the industry.

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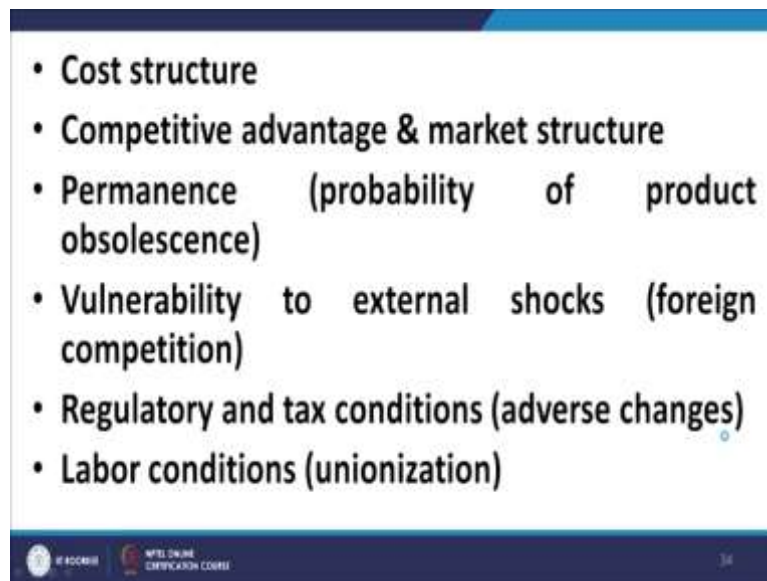


Then we talk about industry analysis. Industry analysis, what are the important factors, issues that need to be considered while doing industry analysis? Let us quickly go through them. Implications of projected growth in gross national product for relevant industries. How do the growth rate in GDP or GNP relates to various industries in the spectrum that is an important, that will convey important message about the growth rates that is possible in the revenues of the target company.

Implication of plan, priorities and plan expenditures for relevant industries, vulnerability of industry under government regulation, and control of prices and production. Implication of industrial and fiscal policies of the government for an industry. Input, output analysis of an industry sales, degree of dependence on scarce non-renewable or imported raw materials and energy intensity, vulnerability of industry to business cycles, linkage between the sector's vulnerable to business cycle and the industries.

Lifecycle position of the industry price and income elasticity of the end products of the industry, analysis of competitive conditions as reflected in the barriers to entry. So, this is an illustrative list. Please note it is not an exhaustive list. It is certainly not an exhaustive list, but it is an illustrative list of issues that need to be examined by the analyst when talking about or when doing industry analysis for valuation purposes.

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We also need to look at cost structures, competitive advantages of market and market structure, permanence, probability of product, obsolescence, vulnerability to external shocks, foreign competition, regulatory and tax conditions and labor conditions.

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Quantitative aspects of our industry analysis, well, we need to do end use analysis that will comprise of identifying demand for the industries products, estimates of future demand, identification of possible substitutes emerging in the market. Then ratio analysis can be done that will help us in examining data over time.

How is the data showing trends over time? What are the patterns incorporated or embedded in the historical data? We can identify those patterns largely through ratio analysis. So,

favorable and unfavorable trends can be looked at. And then, we can also do regression analysis by determining the relationship between various variables.

There are different types of industries. We have the cyclical industry whose performance is positively related to economic activity. We have defensive industry whose performance is insensitive to economic activity, and then, we have growth industry, which is characterized by rapid growth in sales independent of the business cycle. We can split up the industry life cycle itself into several reasonably well-defined segments.

We have the birth phase, which is characterized by heavy research and development costs, heavy research and development expenditure, and large, it may this phase may incur large losses with no revenues. Then we have the growth phase, where the company or the industry goes into the building of the market share and economies of scale and starts using the benefits of economies of scale.

We have the mature growth phase, which is the phase in which the industry realizes the maximum profitability. Then we have stabilization phase, in which, an increase in unit sales may be achieved by decreasing prices. And finally, we have the decline phase, where demand shifts lead to declining sales and profitability, resulting in possible losses.

The industry life cycle and alternative segregation of these segments or the various constituents of the industry life cycle is as follows. A startup stage where many new firms enter into the industry and there is rapid growth. Then we have the consolidation stage, where which is the shakeout period where the inefficient or here we have the maximum of survival of the fittest, and those that are not able to manage or face the competitive environment tend to leave out or tend to move out of the industry.

So, this is the consolidation stage, which is the shake which involves shakeout of the various inefficient or incompetent firms and the growth slows down. And then we have the maturity stage, which grows with the economy, and finally, we have the decline stage where the growth gets lower than the economy. So, this is another characterization of the industry lifecycle. Either of the two could be used or maybe both could be used for analyzing the industrial environment in which the company is operating.

The Porter 5 Forces Model, I am sorry, the Porter 5 Forces Model gives us valuable insights into the nature of the industry, and the relationship between the industry and the company. The 5 forces identified in this model are the threat of new entrants into the industry, threat of

substitutes, bargaining power of buyers, bargaining power of suppliers and rivalry among existing competitors. These are the five forces or five characteristics or five attributes which contribute or which could help us in analyzing, and getting more reliability or reliable information, reliable assessment about the standing of the firm in the industry.

The impact of these five forces briefly let us look at that. If the threat of new entrants is low, the company would enjoy higher pricing power and better prospects for earning growth. If the probability or the threat of new entrants is higher, then the company would have a restricted, restrictions or limitations on the pricing power and better process that is very natural.

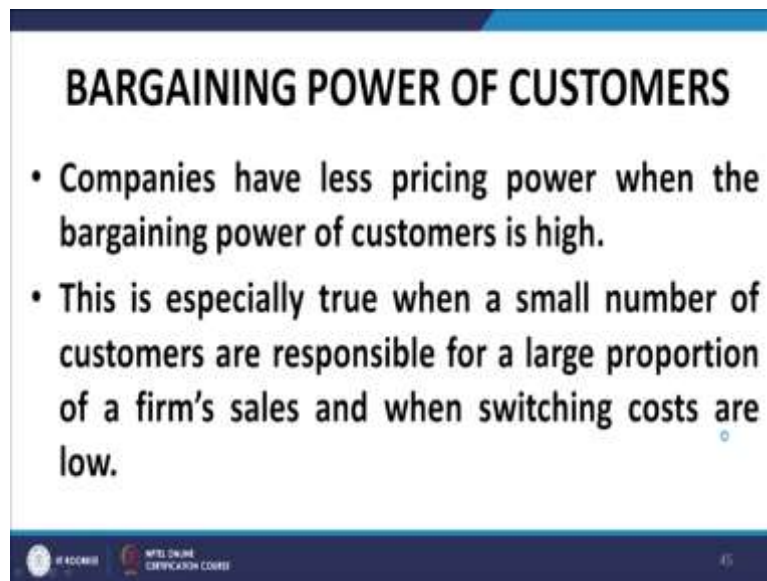
Because the possibility or probability of new entrants into the industry increases the competition or the pressure or the stress on that firm increases. And as a result of which, the margins may need to be squeezed. Significant barriers to entry into an industry make it possible for existing companies to maintain high returns on invested capital.

As I mentioned, just now. Threat of substitute products companies that have less pricing, companies will have, companies will have less pricing power, when the threat of substitute products is high and switching costs are low. So, if there are substitute products available in the market or there is a threat of new substitute products entering into the market, naturally, the pricing power of the target company would be lowered.

Because if the company undertakes or it takes up high pricing or revises price upwards, it will provide an incentive for new entrants or for the substitutes to get into the fray and thereby eat into the margins of the target company.

Bargaining power of suppliers. Again, if the bargaining power of supplier is high, then naturally the company's prospects for earning growth are low. And conversely if the bargaining power of suppliers is low, then the company's prospects for earning growth are higher. If suppliers are few, these suppliers may be able to extract a large portion of any increase in profits.

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BARGAINING POWER OF CUSTOMERS

- Companies have less pricing power when the bargaining power of customers is high.
- This is especially true when a small number of customers are responsible for a large proportion of a firm's sales and when switching costs are low.

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Similarly, bargaining power of customers the logic is pretty much the same. If the company has, if the customers, I am sorry, have high bargaining power then what happens is that, the company will have less pricing power, and will have squeezed margins. This is especially true, when a small number of customers are responsible for a large proportion of the firm's sales and switching costs are low.

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INTENSITY OF INDUSTRY RIVALRY

- Companies have less pricing power when the intensity of industry rivalry is high.

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Intensity of industry rivalry. Companies that have less pricing power, when the intensity of industry rivalry is high. So, if the industry rivalry is high, naturally, there would be higher competition, higher pressure on the target companies, and as a result of which companies the

target company would have lower pricing power. Now, we come to company analysis. So that I will start after the break. Thank you.