INTRODUCTION TO MINERAL ECONOMICS
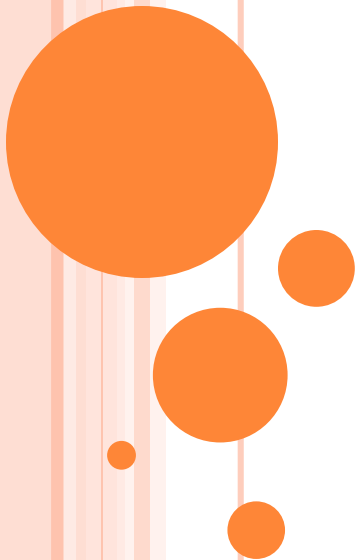
TAXATION, INFLATION AND DEPRECIATION

By

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- Taxation
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  - Basis on which taxes are imposed
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TAXATION

- It refer to all mandatory payments made by the operator to the state in connection with the operations of the mine;

- Taxes levied against mining properties and operations are a critical cost in the economic evaluation of mining investment;

- These taxes represent a substantial cost of doing business in the mineral industry;

CONT …

- They have significant impact on corporate investment decisions;
- Higher taxes reduce project yields;
- Mineral taxation varies from country to country;
- They also vary from one mineral commodity to another;

OBJECTIVES OF TAXATION

○ The key factors to remember with respect to taxes are:

1. They are an enforced (compulsory) contribution – usually monetary;

2. They are enacted by a power having taxing authority;

3. They provide revenue to the government for public purposes;

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CONT ...

4. They are also a mechanism for diverting substantial wealth away from the control of the private sector to the control of the public sector;

5. Taxes are generally implemented to achieve one or more of the following objectives;

1. RAISING REVENUE

- The purpose of most taxes is to provide revenue to the government;
- Without tax, government could not provide services such as;
- 1. Public education;
- 2. Public health and welfare;
- 3. Police protection;
- 4. National defense etc;

2. ECONOMIC DEVELOPMENT

- To provide for economic development and full employment;
- Taxation policies can be designed to inhibit or promote the efficient use and development of natural resources;

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3. PRICE STABILITY

- Price stability is another economic goal of most governments;
- What will happen if prices in the country were not taxed?
- Total spending by the public and private sectors will soon generate considerable excess demand;
- This will consequently create an inflationary bias in the economy.

Cont …

- In order to maintain price stability, there should be a decrease in private or public spending;

- Although the government can employ monetary policy to help promote price stability, it can obviously implement tax policies to decrease private spending;

- By controlling spending and taxing levels a government can either contribute to or inhibit inflation and effects price stability;

3.   WEALTH REDISTRIBUTION

○ Taxation policies may be designed to effect a redistribution of wealth among individuals (private wealth) or from private to public control (tax free zone areas etc);

○ The decision to redistribute wealth is generally predicated on social value judgment or on the basis of an economic judgment;

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5. REGULATORY MEDIUM

- Taxes maybe imposed to influence social behavior that is considered detrimental to society;

- e.g., taxes maybe placed on the purchase and consumption of specific goods e.g. alcohol and tobacco;

- Alternatively, the objective may be to enforce industry to perform in a certain manner or meet given objectives;

- e.g. minimize air and water pollution by placing taxes on waste emissions.

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BASIS ON WHICH TAXES ARE IMPOSED

- Taxes are generally imposed on one of the following basis;
- **Income** – This implies the process of receiving wealth.
- Income taxes are typically applied to ordinary net income (revenue less costs of production) or to excess profit.
- **Wealth** – This refers to actual ownership of wealth rather than a transaction in the wealth is exchanged.
- Property taxes on real personal property are examples of taxes imposed on the wealth base.

CONT ...

- **Expenditures** – A tax base may be associated with any transaction involving spending;

- Sales taxes are good examples of this type of tax base;

- **Activity** – A tax base may be associated with a specific activity;

- Typical taxes which fit in this category may take the form of;

  - Transactions taxes

  - Excise taxes

  - Franchise (license, permit etc) taxes.

TYPES OF TAXES

- **1. Income tax**
- The income tax on a mining operation normally constitutes the most significant form of tax.
- Tax rate is generally either fixed or progressive (i.e. higher levels of net income pay higher tax rates);

TYPES OF TAXES

- Income taxes are levied on income usually after deduction of;

  - Royalties;

  - Depreciation and depletion allowances;

  - Interest on loans;

  - Allowable losses carried forward from previous years.

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TYPES OF TAXES

- For developing countries to be competitive investment candidates the effective tax rate should not be significantly higher than in other countries where it is typically in range 35 – 45%.

- Tax holidays as an attractive investment incentive can however have adverse effects of encouraging high-grading

- This may lead to delays in needed capital expenditure in the attempt to maximize profits during the tax holiday period.

TYPES OF TAXES

- **2. Royalties**
- Royalties are a payment to the government acting as landlord for extraction and exhaustion of non-renewable resources.
- A royalty guarantees that government receives some income from production at the onset without regard to whether the investment is profitable or not.

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TYPES OF TAXES

- **3. Property Taxes (Ad Valorem Tax)**
- Property taxes are fixed costs levied whether there is production or not.
- These taxes are levied against the value of tangible property.
- As such it is a tax on wealth as opposed to income;
- This is a direct tax calculated "according to value" of property;
- Ad valorem tax is based on an assigned valuation (market or assessed) of real property;

TYPES OF TAXES

- **4. Severances Taxes**
- This is a tax paid to the government and represents a direct variable cost incurred as long as there is production, even though the operation may not be profitable.
- This tax is unique to the extraction of natural resources (renewable as well as non-renewable);
- It is commonly considered to be an excise tax.

TYPES OF TAXES

- **5. Import duties, Export taxes and License fees**

- Since import duties and license fees are imposed in the early stages of a mining project, they affect the ability to raise capital to initiate production.

- They tend to increase investors risk since they raise the total cost on explorations and development.

- Mineral export taxes are a direct cost which results in a country being a high cost producer thereby reducing its internationally competitiveness.

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Types of Taxes

- **6. Withholding tax**
- These taxes are normally withheld at source.
- They apply to dividends transferred out of the country;
- They are intended to encourage investors to reinvest part of their profits in the country where they are earned.
- Withholding taxes are profit based and unless they are unreasonably high, are not considered a disincentive to investment.

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TYPES OF TAXES

- **7. Additional Profit Tax**

- This is intended to increase the marginal rate of taxation on projects that may have windfall rate-of-return.

- The mechanism is considered an efficient instrument for capturing economic rent for the government because it is due on actually realized profits;

- It only takes effect when a company reaches a pre-determined rate-of-return.

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TYPES OF TAXES

- **8. Transaction costs**

- These are taxes imposed upon the consumption of a retail sale.

- A good example is the common retail sales tax which is levied against all retail sales of certain commodities.

EFFECTS OF TAXES ON MINERAL DEVELOPMENT

o Taxes fall into two broad categories:

1. Those that add to mining costs e.g. royalties whose bases are independent of profitability.

2. Those taxes that are based on operating profits (income taxes, additional profits tax etc.)

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CONT ...

- A normal tax package comprises a mixture of these categories in varying proportions.

- The impact of a tax package on mineral resources development will depend on the structure of the package itself as well as the overall effective tax rate.

- Some package may stress more on profit based taxes while in others, especially were mining provides the main source of government revenue, tax packages may be more independent of profitability.

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EFFECTS OF INCOME TAX

- Income tax has the effect only if the operation is profitable.

- This type of tax thus becomes effective only after the break-even point has been reached.

- As a result the break-even point as the critical mining rate is unaffected, eliminating the necessity of changing the cut-off grade.

CONT ...

- The amount of reserves remains unaffected since operating costs below the break-even point are not affected.

- However, income taxes have the effect of reducing after tax profits and thereby reduce the projects ability to reinvest.

- The investment's rate of return is also reduced.

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Figure showing effects of income tax
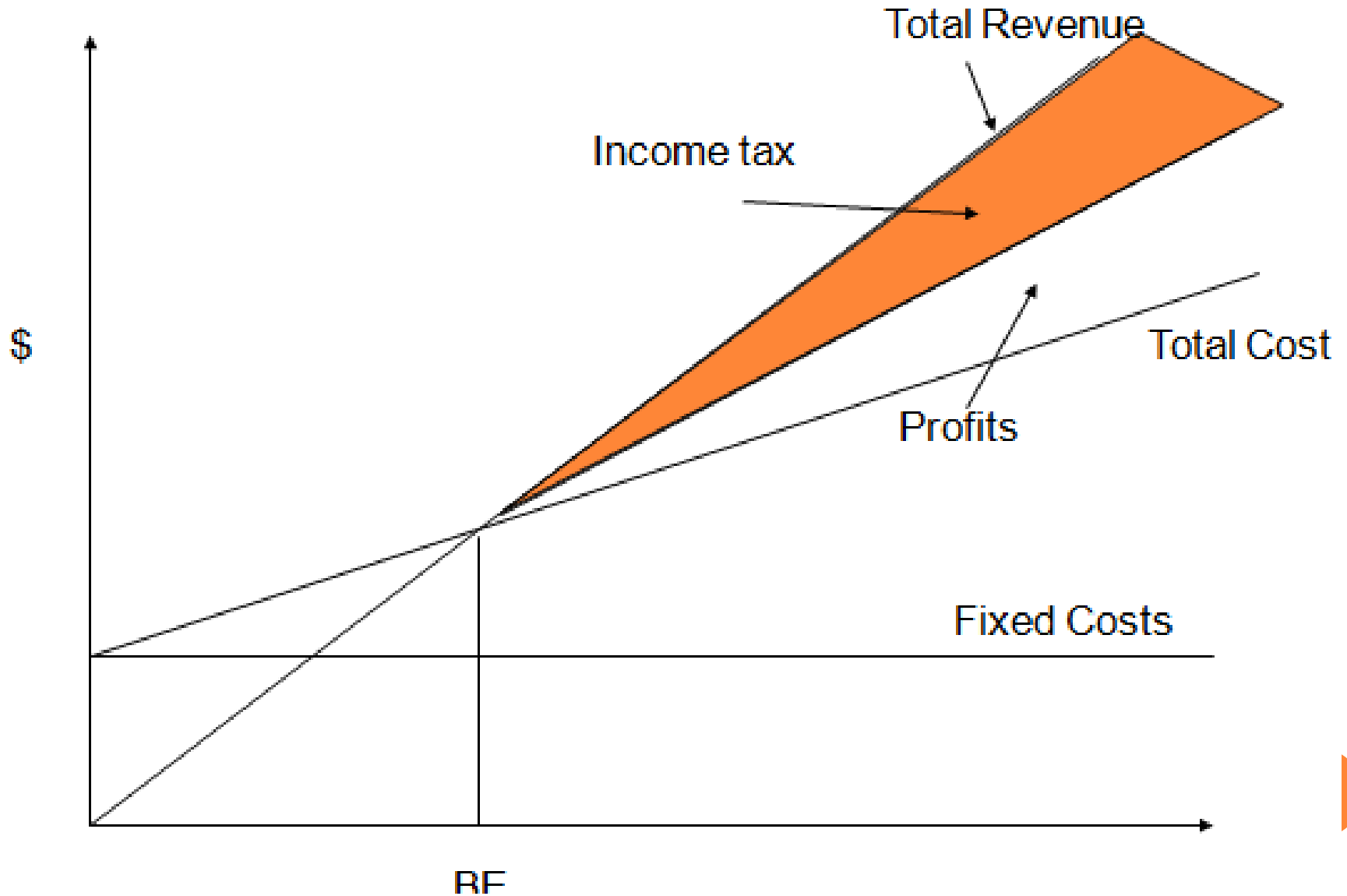
EFFECTS OF SEVERANCE TAX

- Severance taxes are a direct variable costs incurred only when there is production.
- They represent a direct variable cost of production to the operator raising the cutoff grades and decreasing ore reserves.
- These types of taxes raise mining costs;
- They also may lead to high grading of ore that can be exploited profitably.
- In the case of a marginal deposit, without the possibility of raising the cut off grade, the imposition of such taxes may render the deposit unprofitable.

Figure showing Effects of severance tax
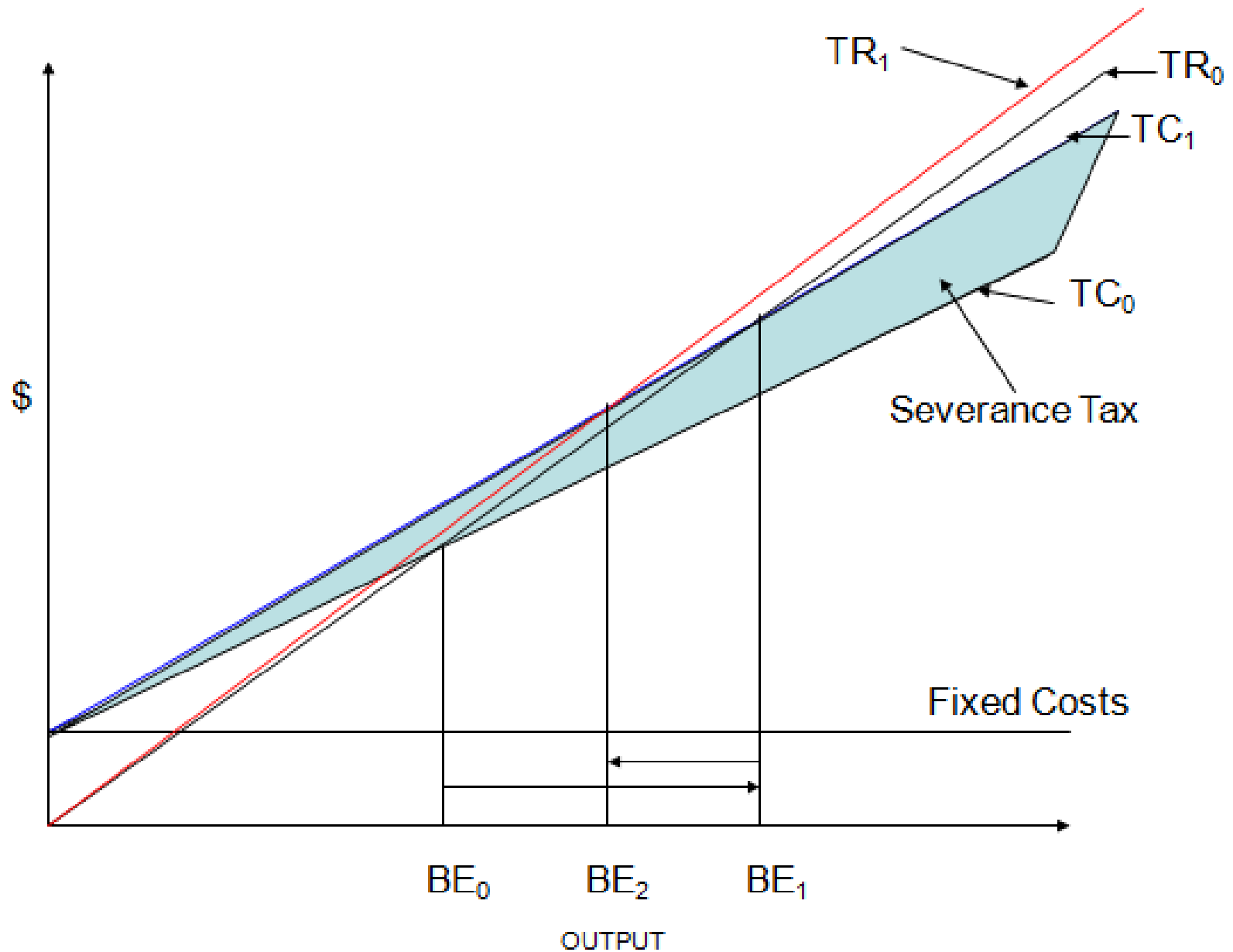
EFFECTS OF AD VALOREM TAX

- These taxes are part of mining costs.
- Ad valorem taxes such as property taxes are fixed costs levied whether there is production or not.
- When Ad varolem taxes are levied on a marginal mining operations, the increase in fixed costs could results in no profits.
- To achieve the break even point, the operator must mine higher unit value ore resulting in higher operating costs;
- Under these conditions the mine operator is usually faced with two alternatives;

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CONT …

1. To close down the operations because it is unprofitable.

2. To raise the cutoff grade and resort to selectively mining only higher grade material.

- This has the effects of reducing the ore reserves;

- Therefore, property taxes have the undesirable effect of reducing the amount of economically recoverable resources.
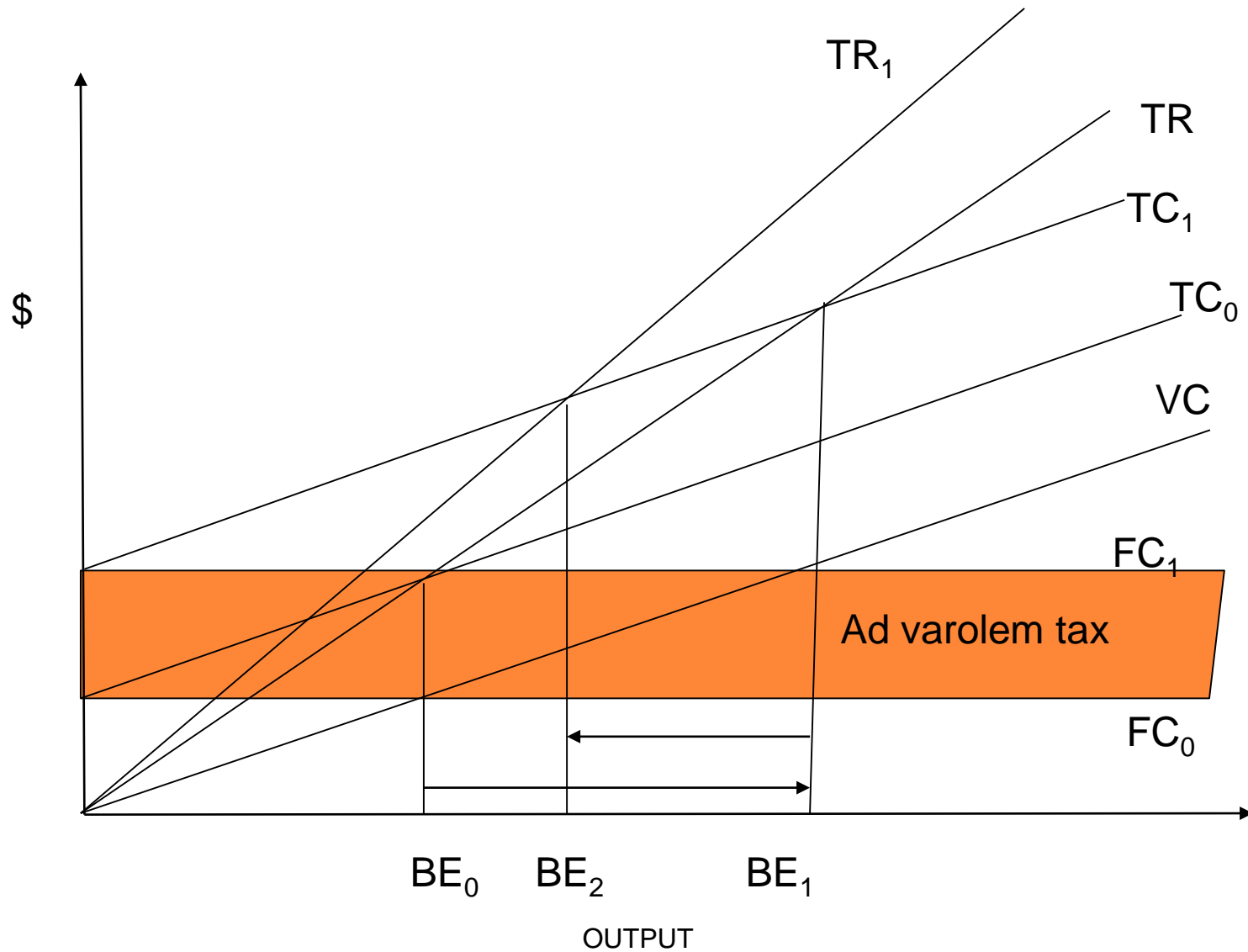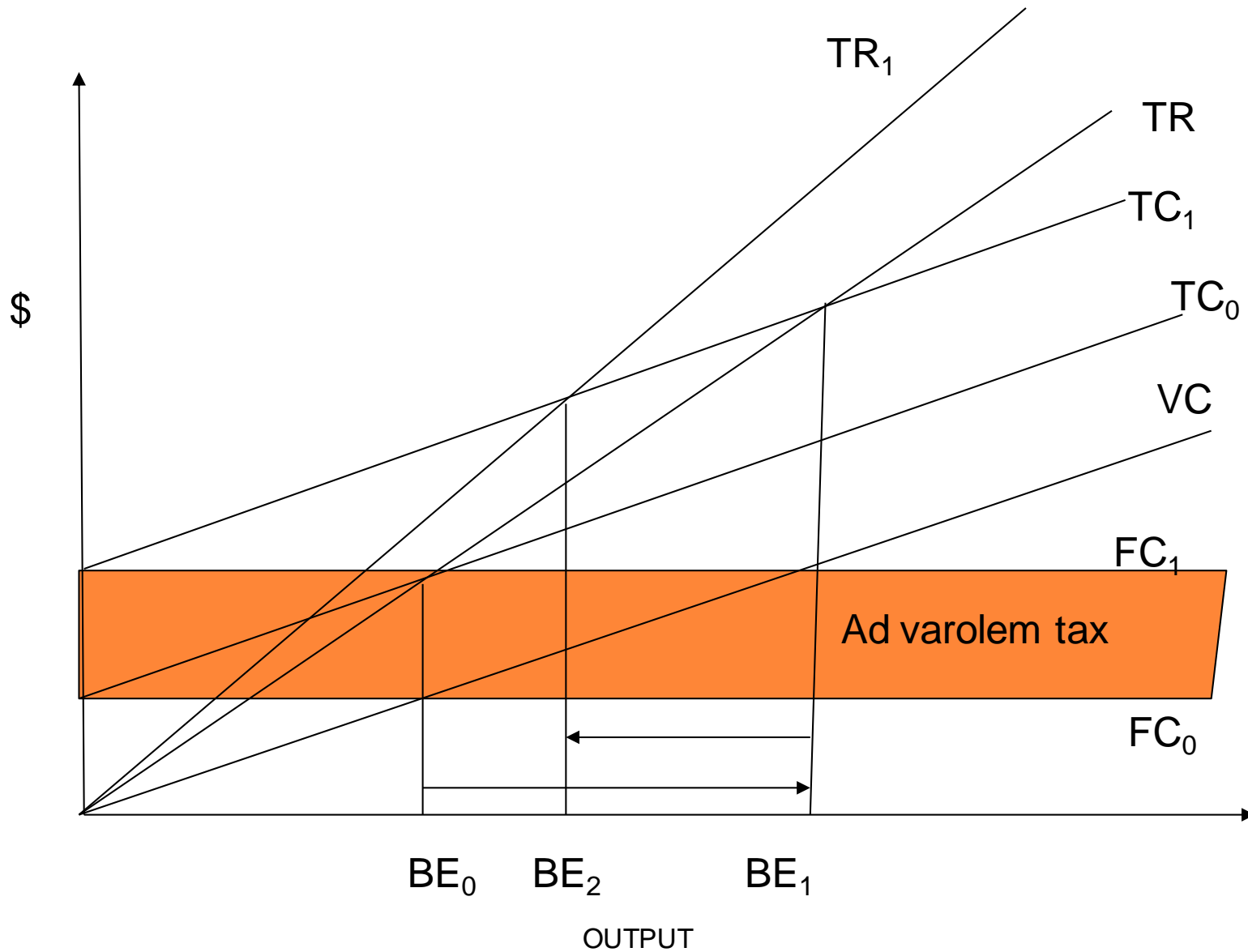
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Figure showing Effects of Ad valorem tax

Figure showing Effects of Ad valorem tax

OVERALL EFFECTS OF TAX PACKAGE

- The overall effect of taxation is that it reduces the after tax rate of return.
- Therefore, high taxation may result in the minimum acceptable rate of return not to be achieved.
- In the case of marginal producers, production may have to be discontinued;
- Or the firm may have to resort to high grading in order to remain profitable.

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CONCLUSION

- The level of taxation affects initial investment decision on a mineral property.
- High taxes have a significant effect on profitability.
- In effect taxation reduces the expected rate of return.
- In the case of high unit value minerals (e.g. gemstones and precious metals) which can be easily smuggled, it encourages tax evasion through illegal trading.
- Property taxes and severance taxes, which are based on production output gross values or income, without any relationship to profitability, represent an additional cost of production.

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CONT ...

- Such taxes may lead to high grading of mineral deposits, a practice that reduces the amount of reserves that would be recovered in the absence of such taxes.

- The level of taxation and structure of taxation may affect the level of exploration and new mine development.

- Because profit, dividend and cash flow taxes are based on profitability, they are considered none acceptable to investors.

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CONT ...

- An optimal tax policy should seek to maximize government revenues from mineral resources development;

- At the same time provide adequate incentives for mine investment to take place;

- Here the art lies in finding the optimal tax structure and level that maximizes the present value of the net social and economic benefits realized from mining.

- Unbalanced high taxes may discourage the mineral investment and result in less than optimal flow of government revenues over time.

CONT ...

o Low taxation on the other hand may stimulate investment but may also result in less than optimal government revenues.

o In practice the determination of the optimal mix and level of taxation is difficult to achieve because their impact on investment has a long time effect.

CONT …

○ Heavy tax burden leads to an uncompetitive sector, which occurs in 3 stages:

1. First stage is identified by loss of ability to attract capital for entirely new venture.

2. Secondly, the loss of the ability to attract capital for expanding existing operations.

3. Lastly, loss of ability to maintain facilities.

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Cont …

○ Early warning signals resulting from burden seeking policies are.

1. Initially, there's a sharp decline or cessation of exploration by private companies despite an existing attractive geological potential.

2. This is followed by a sharp decline in the amount of investment going into developing new mines and processing facilities.

○ A fiscal regime that meets the requirements of both investors and host country objectives has the following attributes:

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CONT …

1. Taxation based on profitability is considered the most rational form of taxation for mineral industry.

2. Mineral taxes should be equitable and non-discriminatory (between local and foreign investors).

3. Mineral taxes should be fixed and remain stable for a long period.

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INFLATION

- Inflation is the decline in the value of money as measured by what it will buy;
- The rate of inflation varies with the particular currency under consideration as well as the type of goods and services being purchased;
- The effect of inflation is to raise the amount of investment required over a period of time
- It also increases the level of cost and revenue elements of the economic model;
- Some of the financial effect of inflation are outlined below:-

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Effects of inflation

- **1. Interest Rates**
- Inflation induces increases in interest rates;
- These are quickly passed on to business borrowers;
- These have raised the cost of short term corporate borrowing;

CONT ...

- **2. Planning Difficulties**
- Business operate on the basis of long-range plans;
- Firms make capital expenditures only after analyzing the expected costs and revenues over the life of the project;
- Making the necessary forecasts during periods of rapid inflation is extremely difficult and risky;

CONT …

- **3. Demand for Capital Increases**
- Inflation increases the amount of capital required to develop a given mine project;
- The costs of construction and acquiring fixed assets are greater;
- Workers demand higher wages;
- Inventories must be replaced with more expensive goods;

CONT …

- **4. Investment Planning**
- Higher interest rates and shortages of available capital cause firms to be wary (cautious) in planning long-term investment outlays;
- Cutbacks in long-term spending budgets have become common;

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CONT ...

- **5. Accounting Problems**
- Reported profits are distorted during times of higher inflation rates;
- The sale of low cost inventories result in higher reported profits but cash flows are held down as firms restock with higher-cost inventories;
- **6. Inflation Forecasting Difficulties**
- There is no way of forecasting price changes accurately;

TREATMENT OF INFLATION

- Inflation represents the continuous depreciation of the value of money in terms of what it will buy;

- Therefore, all cash flow analyses should be adjusted for inflation;

- There are four methods for treating inflation for purposes of cash flow analysis;

CONT …

- (1) Estimate all costs and revenues in US Dollar values as at the date of the study.

- Assume:-

- Future costs and revenues inflate at same rate;

- Capital costs quoted are less than will actually be required;

CONT ...

- (2) Inflate all variables to the value expected at the start of production and thereafter use constant dollar values as of that date
- (3) Assume a constant rate of inflation for each variable and inflate each variable at the specified rate;
- Internal Rate of Return will have inflation rate built in;
- Discount rate should be adjusted for inflation;

CONT ...

- (4) Assume an explicit (open) inflation rate for each variable, for each year in the project life;
- Inflate the cash flow components through the life of the mine;
- Then deflate the annual net cash flows at an average inflation rate;

CONT ...

- Use these deflated cash flows to do the DCF analysis;
- The resultant IRR and NPV will not have a factor for inflation included in them;
- This will be similar to the current dollar calculation;

DEPRECIATION

- **Depreciation** is the periodic write off of the cost of items, property or other long lived tangible assets;
- It is a decrease in worth of such tangible assets as buildings, machinery and equipment;
- Most industrial assets are worthless as they get older;

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CONT ...

- Also, production facilities become less valuable as they get older and eventually they have to be replaced or retired;

- This change in worth is accounted for by the depreciated charges made during the productive life of an asset;

- These charges are intended to account for the loss in the value of capital assets;

- Depreciation charges is regarded as expenses that affects net income i.e. they reduce the amount of tax paid;

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CAUSES OF DEPRECIATION

- Physical depreciation;
- Functional depreciation;
- Technological depreciation;
- Depletion;
- Monetary depreciation;

1. PHYSICAL DEPRECIATION

- Everyday, wear and tear of operation gradually lessens the physical ability of an asset to perform its intended function;

- A good maintenance program retards the rate of decline;

- However, it rarely maintains the precision expected from a new machine;

- In addition to the normal wear, accidental physical damage can also impair its ability;

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2. FUNCTIONAL DEPRECIATION

- Demands made on an asset may increase beyond its capacity to produce;

- A mining truck unable to meet the increased production demand no longer serves its intended function;

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3.   TECHNOLOGICAL DEPRECIATION

- Newly developed means of accomplishing a function may make the present means uneconomical;

- e.g. steam locomotives lost value rapidly as rail roads turned to diesel power;

- Current product styling, new materials, improved safety and better quality at lower cost from new developments make old designs obsolete;

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4. DEPLETION

- Consumption of any exhaustible natural resource to produce products or service is termed depletion;

- Removal of oil, timber, rock or minerals from a site decreases the value of the holding;

- Theoretically, the depreciation charge per unit of the resources removed is:

  - Depletion rate ($/Unit) = Present value of resources ÷ Remaining units of reserves;

- Normally, allowances for depreciation vary with the type of resource;

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5. MONETARY DEPRECIATION

- If prices rise during the life of an asset, a comparable replacement becomes more expensive;

- This means that the capital recovered will be insufficient to provide an adequate substitute for the worn-out asset;

- Because the depreciation is actually happening to the invested capital representing the asset instead of the asset itself, monetary depreciation is very difficult to estimate.
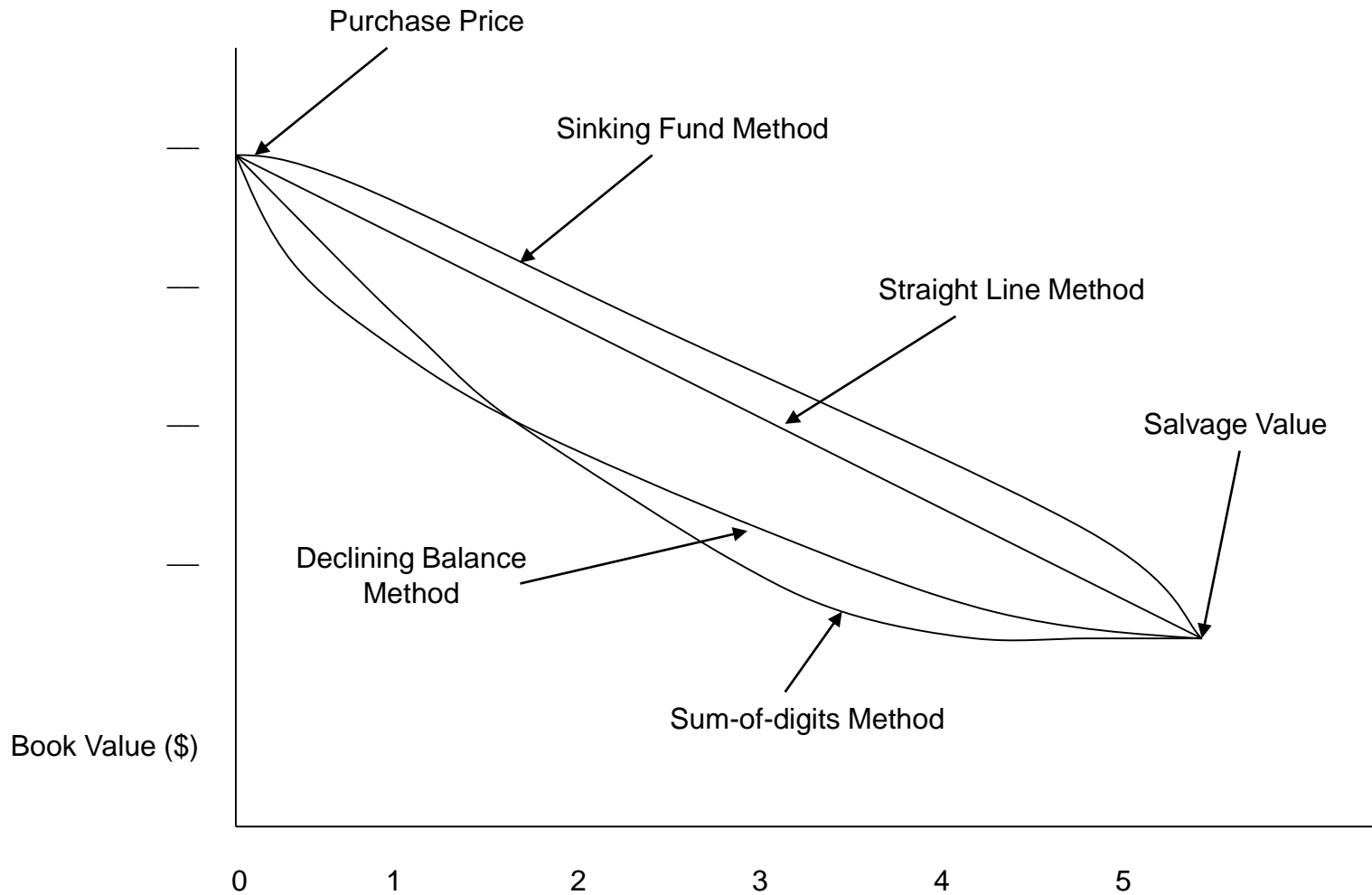
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DEPRECIATION METHODS

- These are methods for calculating depreciation of an asset;

- These are methods which are applicable to any kind of depreciable asset;

- The methods are based strictly on time or the level of activity (or use) of the asset.

- Each depreciation method has unique features;

CONT ...

○ A method by which the bulk of the money invested is recovered early in the life of an asset is a popular conservative view;

○ Methods by which the annual charge is constant simplifies the accounting procedures;

○ The following are the depreciation method available.

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CONT ...

1. Straight Line (SL) Method
2. Sum-of-digits method
3. Declining balance method
4. Sinking fund method

Purchase Price

Sinking Fund Method

Straight Line Method

Salvage Value

Declining Balance
Method

Sum-of-digits Method

Book Value ($)

0   1   2   3   4   5

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STRAIGHT LINE (SL) METHOD

- Straight line method is an old, simple and most often used method of computing depreciation.
- The annual depreciation is constant.
- The **book value** is the difference between the purchase price and the product of the number of years of use multiply by the annual depreciation charge.
- **Salvage value** is a non recurring cost or revenue related to the termination of an asset's service.

CONT …

- It is a net value in that it is the sum of all the positive and negative cash transactions associated with the disposal of an asset.

- P   = Purchase Price of asset;

- S   = Salvage Value of future value at the end of the asset's economic life;

- n   = Economic life in years;

- N   = Number of years of depreciation or use from the time of purchase;

- i   = Interest rate received on invested capital.

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Annual depreciation charge $= \dfrac{P - S}{n}$

Book value at end of year N $= P - \dfrac{N}{n}\left(P - S\right)$

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EXAMPLE

- Open pit trucks purchased by a mining company cost US$4000 each. Past records indicate the trucks should have an economic life of 5 years. They can be sold for an average of US$ 800 each after 5 years of use. The company currently receives 7% interest on invested funds. Using **straight line method**, determine:-
  - The depreciation charge during year 1.
  - The depreciation charge during year 2.
  - The depreciation reserve accumulated by the end of year 3.
  - The book value at the end of year 3.

SOLUTION

- (a) and (b) Since the annual depreciation cost is constant, the charges for both the 1st and 2nd year are equal, i.e.:-

Annual depreciation charge $= \dfrac{P - S}{n}$

$= (4000 - 800) / 5$

$= \$640$ per year

Cont ...

- (c) The depreciation reserve at the end of year 3 is the sum of the annual depreciation charges for the first 3 years are;

- $\qquad$ 3 x 640 = **US$1920**

- (d) The book value at the end of 3 years

$$P - \frac{N}{n}(P - S)$$

$$4000 - \frac{3}{5}(4000 - 800)$$

= $2080

SUM-OF-DIGITS METHOD

- The sum-of-digits method provides a larger depreciation charge during the early years of ownership than in the later years.
- The name is taken from the calculation procedure.
- The annual charge is the ratio of the digit representing the;
  - remaining years of life (n – N + 1)
  - to the sum of the digits for the entire life (1 + 2 + 3 + … + n)
  - multiplied by the initial price minus the salvage value (P – S).
- Thus the annual charge decreases each year from a maximum the first year.

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Annual Depreciation Charge

$$= \frac{\text{Remaining years}}{\text{Sum-of-digits for entire life}} \, x(P-S)$$

$$= \frac{n - N + 1}{1 + 2 + 3 + \ldots + n} \, x(P-S)$$

$$= \frac{2(n - N + 1)}{n(n + 1)} \, x(P-S)$$

Book Value at end of year N is:

$$= \frac{2[1 + 2 + ... + (n - N)]}{n(n + 1)}(P - S) + S$$

EXAMPLE

○ Open pit trucks purchased by a mining company cost US$4000 each. Past records indicate the trucks should have an economic life of 5 years. They can be sold for an average of US$ 800 each after 5 years of use. The company currently receives 7% interest on invested funds. Using **Sum-of-digit method**, determine:-

- The depreciation charge during year 1.
- The depreciation charge during year 2.
- The depreciation reserve accumulated by the end of year 3.
- The book value at the end of year 3.

Solution

- (a) The sum of digits for the 5 year economic life is;

- (1+2+3+4+5) = 15

- Depreciation charge during year 1;

$$= \frac{n - N + 1}{1 + 2 + 3 + \ldots + n} \, x(P - S)$$

$$= \frac{5 - 1 + 1}{15} \, x(4000 - 800)$$

$$= \frac{5}{15} \, x(3200) = \$1067$$

Cont ...

- (b) after the first year, only 4 years remain in the economic life. Therefore, with;

- (n - N+1) = (5-2+1) = 4

- Depreciation charge during year 2 =

$$= \frac{4}{15} \, \text{x} \left(3200 \right) = \$853$$

CONT …

- (c) The ratio for calculating the depreciation reserve has a numerator equal to the sum of digits representing the years during which the reserves was built up;

$$= \frac{5+4+3}{15} \, x(3200) = \$2560$$

CONT ...

- Book value at the end of year 3 =
- P – Depreciation reserve
- 4000 – 2560 = 1440

$$\text{Or by formula} = \frac{2[1+2+...+(n-N)]}{n(n+1)}(P-S)+S$$

$$= \frac{2[1+(5-3)]}{5(5+1)}(3200)+800 = \$1440$$

DECLINING-BALANCE METHOD

- The declining-balance method is another means of amortizing (paying back) an asset at an accelerated rate early in its life, with corresponding lower annual charges near the end of service.

- An important point with this method is that the salvage value must be greater than zero.

- A depreciation rate is calculated from the expression:

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CONT ...

$$\text{Depreciation rate} = 1 - \left(\frac{S}{P}\right)^{\frac{1}{n}}$$

- Which requires a positive value for the salvage value (S).
- This constant rate is applied to the book value for each depreciation period.

CONT ...

- Book value at the end of year N
  $= P (1 - \text{Depreciation rate})^N$

$$= P\left\{1 - \left[1 - \left(\frac{S}{P}\right)^{\frac{1}{n}}\right]\right\}^N$$

$$= P\left(\frac{S}{P}\right)^{\frac{N}{n}}$$

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CONT …

- Annual depreciation Charge =

$$= \text{Book value at } (N-1)x\left[1 - \left(\frac{S}{P}\right)^{\frac{1}{n}}\right]$$

Book value at end of year N = $P\left(\dfrac{S}{P}\right)^{\frac{N}{n}}$

EXAMPLE

○ Open pit trucks purchased by a mining company cost US$4000 each. Past records indicate the trucks should have an economic life of 5 years. They can be sold for an average of US$ 800 each after 5 years of use. The company currently receives 7% interest on invested funds. Using Declining-balance method, determine:-

- The depreciation charge during year 1.
- The depreciation charge during year 2.
- The depreciation reserve accumulated by the end of year 3.
- The book value at the end of year 3.

SOLUTION

- (a) Multiplying the purchase price by the depreciation rate gives;
- Depreciation charge in year 1 =

$$\text{Depreciation Charge} = (N-1) \times \left(1 - \left(\frac{S}{P}\right)^{\frac{1}{n}}\right)$$

$$(4000) \times \left(1 - \left(\frac{800}{4000}\right)^{\frac{1}{5}}\right)$$

4000 x 0.276 = **$1104**

Cont …

- (b) Since the depreciation charge rate is constant, it is multiplied by the undepreciated balance to produce;

$$(4000 - 1104) \times 0.276 = \$799$$

- (c) the accumulated depreciation can be calculated by summing the annual charges to yield;

CONT …

- Depreciation reserve at end of year 3 =
- (1104 + 799 + (4000-1104-799)x0.276)
- = 1903 + 2097 x 0.276
- **= $2482**

- Book value at the end of year 3 =

$$\text{Book value} = P\left\{1 - \left[1 - \left(\frac{S}{P}\right)^{\frac{1}{n}}\right]\right\}^{N}$$

$$4000(1 - 0.276)^{3} = \$1515$$

SINKING-FUND METHOD

- The sinking fund method has the slowest rate of capital recovery;

- In this method, a separate depreciation reserve fund is established by payments invested outside the company.

- The interest earned by the fund is the interest paid by the organisation that holds the investment.

- The annual payments are determined by the sinking-fund formula

$$\left(a \middle/ f \right)_n^i$$

Where;

f = is the amount needed to replace the asset,

n = is the economic life

i = is the interest received on the invested funds.

a = annual payments

CONT ...

- Annual Depreciation Charge =

$$(P - S)x\left(\frac{a}{f}\right)^i_n$$

- Book value at end of year N =

$$P - (P - S)\left(\frac{a}{f}\right)^i_n\left(\frac{f}{a}\right)^i_N$$

EXAMPLE

- Open pit trucks purchased by a mining company cost US$4000 each. Past records indicate the trucks should have an economic life of 5 years. They can be sold for an average of US$ 800 each after 5 years of use.   The company currently receives 7% interest on invested funds. Using Sinking Fund method, determine:-
  - The depreciation charge during year 1.
  - The depreciation charge during year 2.
  - The depreciation reserve accumulated by the end of year 3.
  - The book value at the end of year 3.

SOLUTION

- (a) and (b) the constant annual charge for depreciation is;

$$(P - S) x \left(\frac{a}{f} \right)_n^i$$

$$(4000 - 800) x \left(\frac{a}{f} \right)_5^7$$

3200 x 0.17389 (from tables) = $556

CONT …

- (b) depreciation reserve at the end of year 3 is:

$$P - (P - S)\left(\frac{a}{f}\right)_n^i\left(\frac{f}{a}\right)_N^i$$

$$3200\left(\frac{a}{f}\right)_5^7\left(\frac{f}{a}\right)_3^7$$

$$556x\left(\frac{f}{a}\right)_3^7$$

$$556x3.215 = \$1782$$

Cont

- (c) Book value at the end of year 3 is:

- P – Accumulated depreciation
- $4000 - 1782 = $**$2212**

END