MI 465: MINERAL ECONOMICS

Semester I: 2011

Dr. Stephens M Kambani

TOPICS:

- Basic economic concepts: Microeconomics and Macroeconomics

  The study of microeconomics and macroeconomics in relation to mineral economics

- The role of firms and markets in the microeconomy

  How business firms fit into the microeconomics picture. The emergence *of entrepreneurship. Structure of contemporary business enterprise. The firm and the market place. The concept of the market. The firm and its corporate strategy*

- The theory of supply and demand

  Factors affecting demand. Elasticities of demand
  Factors affecting supply

- How markets function

  The model of perfect competition. The model of monopolistic competition. The many models of oligopoly. The case of monopoly. Analysing the strength of competition. Evaluating competition and market performance.

- The firm and Technological change

  The concept of production. Production activity. Transforming inputs into outputs. Basic types of production activity. The production function. The impact of technological advance on production functions. The consequences of technological change for production processes. Characteristics of technological progress. R&D spending and firm size. The motivation and pressures for innovation.

- Production analysis

  Fixed and variable inputs. Short run and the long run. Short run production functions

- Cost functions and economies of scale

  The concept of costs. The many aspects of cost. Cost output relationships. Cost-output relationships in the short run. Cost output relationships in the long-run. Cost behaviour and firm size.

- The firm and its goals

  The ambiguous meaning of profit. Theories of profit. Do business firms seek to maximize profits? Alternatives to profit maximization. Satisficing behaviour. Revenue maximization. Market share goals. Long-run survival goals. The goal of social responsibility. Security, autonomy, and growth. Growth and expansion goals

GRADING:

- Assignments: 10%
- Research paper 5%
- Tests: 15%
- Final examination: 70%

TEXTS:

1) Ahuja, H.I , (2004), "Macroeconomics", S. Chand & company, ISBN 81-219-0335-1.
2) Ahuja, H.I , (2004), "Principles of microeconomics" S. Chand & Company.
3) Class notes handouts

1. BASIC ECONOMIC CONCEPTS

WHAT IS ECONOMICS?

- ► *Definition*
- ► *Key issues in the study of economics*
- ► *Branches of economics*

SOME DEFINITIONS:

- *Economics asks what goods are produced, how these goods are produced, and for whom they are produced.*

- *Economics analyses movements in the overall economy – trends in prices, output, unemployment, and foreign trade. Once such trends are understood, economics helps develop the policies by which governments can improve the performance of the economy*

- *Economics is the study of commerce among nations. It helps explain why nations export some goods and import others, and analyses the effects of putting economic barriers at national frontiers.*

- *Economics is the science of choice. It studies how people choose to use scarce or limited productive resources (labour, equipment, technical knowledge), to produce various commodities (such as mineral resources, missiles, and concerts).*

- *Economics is the study of money, banking, capital, and wealth.*

In a nutshell, "economics is the study of how societies use scarce Resources to produce valuable commodities and distribute them among different people".

BRANCHES OF ECONOMICS

ECONOMICS = *MACROECONOMICS + MICROECONOMICS*

What is Macroeconomics?

Studies the functioning of the economy as a whole – examining the economy through a wide-angle lens. Macroeconomics examines how the level of growth of output are determined, analyses inflation and unemployment, asks about the total money supply and investigates why some nations thrive while others stagnate.

To evaluate the success of an economy's overall performance, economists look at four areas:

- ► Output measured by the Gross Domestic Product (GDP)
- ► Employment (level of unemployment)
- ► Price stability
- ► International trade

GOALS AND INSTRUMENTS OF MACROECONOMIC POLICY

Objectives **(Major goals of macroeconomic policies – wish list)**	**Instruments** **(Tools available to accomplish the wish list)**
Output (as measured by the GDP): High level of output Rapid growth rate of output	Fiscal policy: Government expenditure Taxation
Employment: High level of employment Low involuntary unemployment	Monetary policy: Control of money supply affecting interest rates
Price level stability with free markets	Foreign economics: Trade policies Exchange-rate Intervention
International trade: Export and import equilibrium (preferably the existence of trade surplus) Exchange-rate stability (not too strong or too weak)	Income policies: From voluntary guidelines to mandatory controls

HOW DOES MACROECONOMICS AFFECT THE MINERAL SECTOR?

- At macro level, government sets sectoral policies (in this case the national mineral policy) which may affect the sector (positively or negatively depending on its structure and promotional aspects).
- Through its fiscal policy. Government fixes taxation that may affect investment if discriminatory and uncompetitive and reduce government earnings if set very low by the state (the case of Zambian copper mining industry).

- Trade policies may affect the manner in which mineral products are traded. Do mine owners retain all the forex? Do they market through government agencies? No limitations on externalization of profits?
- How is the forex rate fixed? Free floating or government controlled? Exchange rate mechanisms affect trade.
- Do employment policies restrict expatriate workers?
- Interest rates have a bearing on the cost of capital and hence affect investment in the sector.

MICROECONOMICS

What is Microeconomics?

> *Analyses the behaviour of individual components of the economy like industries, firms and households. The focus is on trees not the forest. The study is about among other things, how individual prices are set, consider what determines the price of land, labour and enquire into the strengths and weaknesses of the market mechanism. Microeconomics is economics through the microscope.*

In reviewing the subject of microeconomics, we examine the mining firm and the market place.

- ► *The concept of the market place*
- ► *How a market functions*
- ► *The firm and its corporate strategy*
- ► *The firm and technological change*
- ► *Cost functions and economies of scale:*
  - *Cost-output relationships in short-run*
  - *Cost-output relationships in long-run*

THE MINING FIRM AND THE MARKET PLACE

Conventional economic theory instructs that the firm and its business are governed by forces in the marketplace. The firm is depicted as reacting and responding to market supply and demand conditions – conditions that are beyond its purview to control. The market, not the firm is held to be hub of economic activity and the focus of analytical concern.

The concept of the market

In a competitive enterprise system, "the market" is held to be the supreme over all other economic units. Its importance is like that of the sun in the solar system – all economic activity revolves around the market. The market is where buyers and sellers conduct

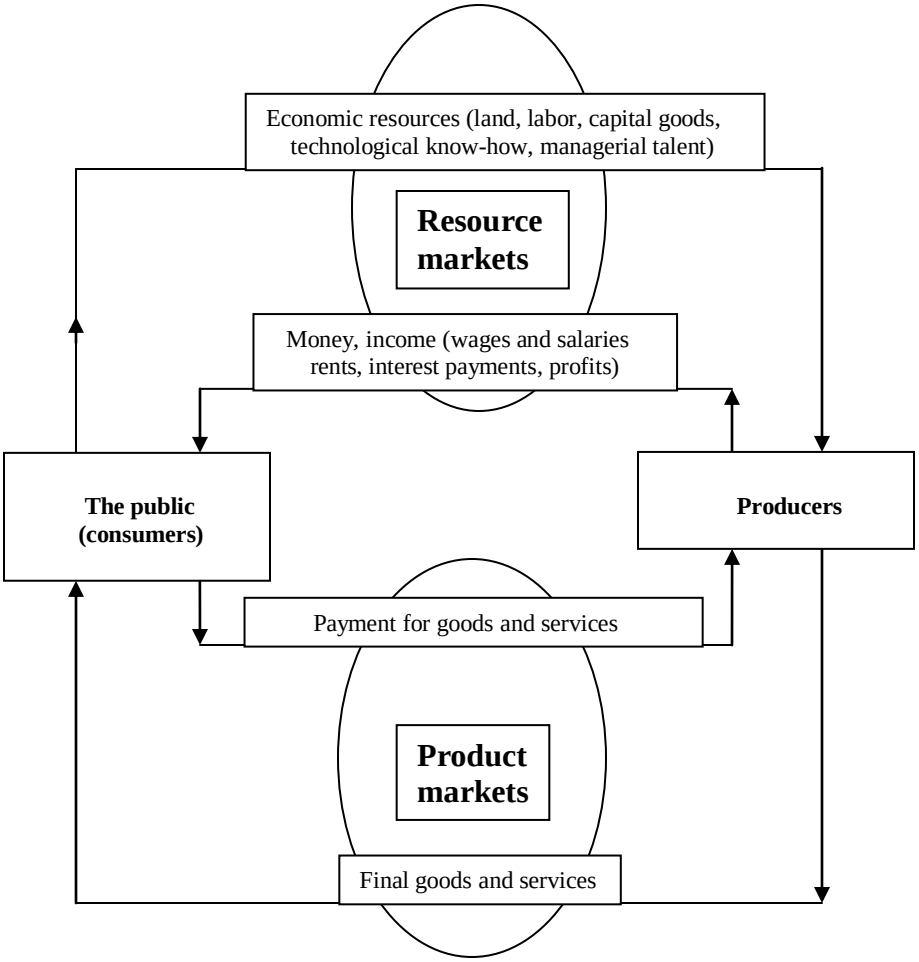
business. Therefore the market is two sided: it reflects both demand and supply conditions and does so simultaneously.

A market is seldom a single, precisely defined geographical place. Think of e-commerce!

The Role of firms in and markets in the microeconomy

To develop some perspective for a study of microeconomics, it is helps to begin with a feeling for what an economic system is and how it works. The basic economic activities that take place in a modern economy are summarized as:

1



The public, as owners of economic resources, sell their resources to producers in resource markets. From a viewpoint of the public, the sale of these resources generates money income; from the viewpoint of producers, the purchase of economic resources represents costs of production. Producers utilize the resources they purchase to make goods and services, which, in turn, are sold to the public through product markets. The public's source of income to make these purchases is of course, the money income obtained as resource suppliers. From the public's view point, the purchases of goods and services are expenditures; from the producer's viewpoint these same dollar flows are revenues. Bothe the clockwise flow of economic resources and final goods and services and the counterclockwise flow of money incomes and dollar expenditures for final goods and services are simultaneous and repetitive.

Various countries have elected to us different economic systems both in organising resources in the production process and in distributing the resultant goods and services.

Three basic systems:

- ***A traditional economic system*** relying on custom, habit, social mores, and tried and true methods of achieving economic goals; technology is primitive, changes are slow and production is undertaken in the same way as last year and year before. Tradition and status quo are perpetuated. Examples are abound in most rural areas.
- ***A command economy system*** relies upon public ownership and centralized control of the basic means of production; severe limitations are placed upon individual choice when such choices conflict with government determined economic priorities. Economic plans and activities are under the control of government. Heavy use is made of governmental directives, the assumption being that the government is in the best position to decide what economic choices and policies are beneficial for the economy and its component parts. Both socialistic and communistic nations are examples of command economies.
- ***A capitalistic or market economic system*** emphasizes private ownership, individual economic freedom, competition, the profit motive, and the price system in the achievement of economic goals. Each economic unit decides what choices and policies are best for it, the thesis being that in encouraging the drive for individual economic self-interest, the outcome proves also to be in the overall best interests of society because of the strong incentives for efficiency, productivity, and satisfaction of consumers.

HOW A MARKET FUNCTIONS – *The market mechanism*

The Law of Supply and Demand

The prime movers in our perfect market model are the forces of supply and demand. The interaction of these market forces determine the price of the mineral commodity and the quantity exchanged.

The demand side of the Market:

The following figure represents the demand curve DD.

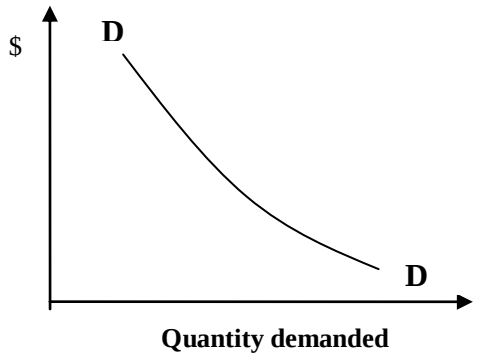


Fig. 1 Demand curve

- Reflects the intensity with which buyers want and are willing to pay for the product in question.
- Represented by a curve showing the various quantities which buyers are willing to purchase at each of various quantities which buyers are willing to purchase at each of various possible prices, all things being equal.
- Conceptually, the curve slopes downward because typically buyers are willing to purchase less at higher prices than lower prices.
- Events such as rising income, changes in the prices of substitute products and shifts in preferences and life styles can and do shift the shape and position of the curve.

What factors affect demand for a mineral?

Determinants of demand can generally be represented by the function:

$$Q_d = f(P, P_r, T, I, E, R, N, O)$$

Where, Q_d = quantity demanded of a particular mineral product
P = market price of the mineral product
P_r = price of related mineral products
T = consumer tast*es* and preferences

I = Level of consumer incomes (or purchasing power)
E = consumer expectations about future prices, incomes and product availability
R = range of products available to consumers
N = number of potential consumers (market size)
O = all other factors which may influence Q_d

Market price of the mineral product:

The interrelationship between the product price and quantities demanded with all factors remaining constant is as shown in Fig. 1 above. Generally more quantities are demanded at lower prices and vice versa.

Price of related mineral products:

This is an important demand variable because of interrelationshionships that exist among mineral products. Two types may exist;

i) Substitutes

A substitute material must functionally replace the product.

Examples:

a) Aluminum has been used to replace copper when the price is high in electrical application.
b) Synthetic gemstones and imitations have been used in place of natural ones (emerald, tanzanite, spinel, quartz, diamonds, ruby, etc.)
c) Plastics have replaced pipings, car radiators, etc.

ii) Complimentary

In the case of complimentary products, the products are demanded jointly.

Examples:

a) The demand for steel alloys will increase the demand for iron.
b) The demand for chrome will increase with demand for chrome alloys
c) The demand for jewellerly will increase the demand for gemstones.
d) Demand for butter increases with demand for bread.

Consumer Tastes and Preferences:

When consumer perceptions of a good or service become less favourable, market demand for the item lessens and vice versa. Consumer taste and preference patterns undergo continuous review and are subject to change, sometimes gradual and sometimes rapid.,

over time. The emergence of new and better products, changing values and life styles, new information about health and safety features of products, busuiness cycle, rising standards of living, higher levels of affluence, and advertising, to mention a few, all exert a pervasive influence upon consumer tastes and preferences.

Consumer Income:

Willingness to buy is in itself insufficient; consumers must be able to pay for the commodities they want. Typically, the greater is consumer income the greater will be demand for goods in general and for some items in particular. Only in the case of inferior goods is rising income accompanied by a weakening demand.

Consumer Expectations:

Expectations with respect to future prices, income levels, product availability can have an effect on the demand for a mineral commodity.

Other:

All other factors that may affect demand

- Is a good a luxury or necessity? This is largely a function a function of life styles and value judgements
- Degree of market saturation for a product
- Discretionary income – This is the residual amount of income remaining after subtracting necessary living expenses and fixed payment charges from disposable personal income. Demand for some goods depends on discretionary income.
- Disasters

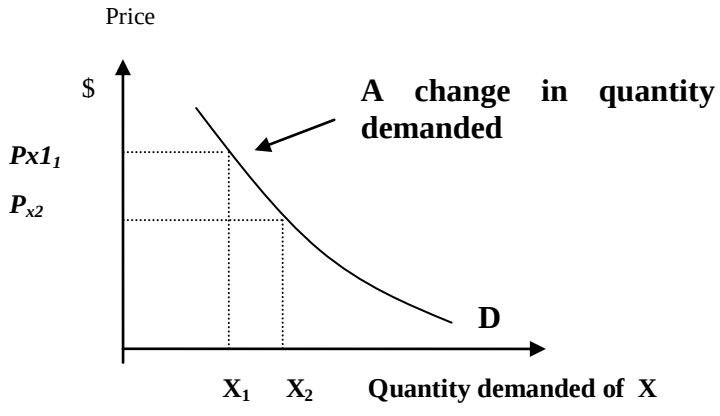


Fig. 2 Demand curve – change in demand

In the demand function, with all other factors held constant, the quantities demanded may relate to its market price as indicated in Figure 2. A reduction in the price from P_{x1} *to* P_{x2} results in an increase in the quantity demanded. There is a change in quantity demanded.

Shift in demand may also happen if there is a change in one of the determinants of demand . In this case the entire demand curve may shift outward or inward depending on the causating factor. For instance, if all other factors are held constant and the income level increases, the demand curve may shift outward and vice versa as shown in the figure below.

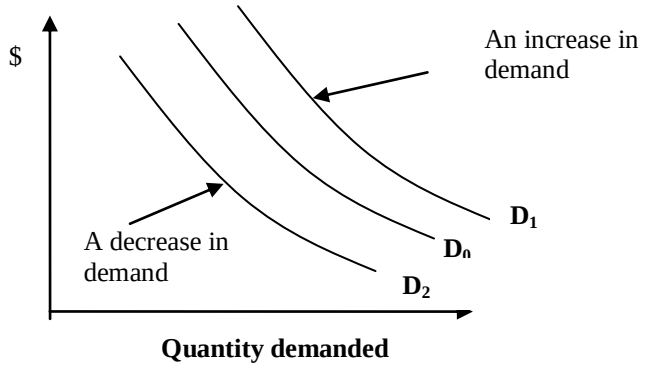


Fig. 3 Demand curve – shifts in demand

Elasticity of demand

The concept of elasticity of demand is one of the most important aspects of demand analysis. In general terms, elasticity of demand measures the magnitude of the responsiveness or sensitivity of the quantity demanded of a commodity to a change in some demand determinant. More specifically, elasticity concerns the extent to which a percentage change in one demand variable causes a percentage change in the quantity demanded.

$$\varepsilon = \frac{\text{\% change in quantity demanded}}{\text{\% change in any demand determinant}}$$

There are as many kinds of elasticity of demand as there are numbers of demand determinants for a commodity (price elasticity, income elasticity, etc).

Price elasticity of demand

The relation of a commodity price to sales volume is of major interest to business firms as a basis for pricing policy, sales strategy, and achievement of profit and market share objectives.

Price elasticity of demand can be defined as:

$$\varepsilon = \frac{\text{\% change in quantity demanded}}{\text{\% change in price}}$$

The coefficient of price of elasticity is always negative. This is because the price and quantity demanded are inversely related.

Two methods of calculating price elasticity exist – the arc elasticity method and the point elasticity method.

Arc method: This is a measure of the responsiveness of the quantity demanded between two seperate points on the demand curve.

Example:

Determine the degree of responsivess of the quantity demanded to a decrease in price from $12 to $10.

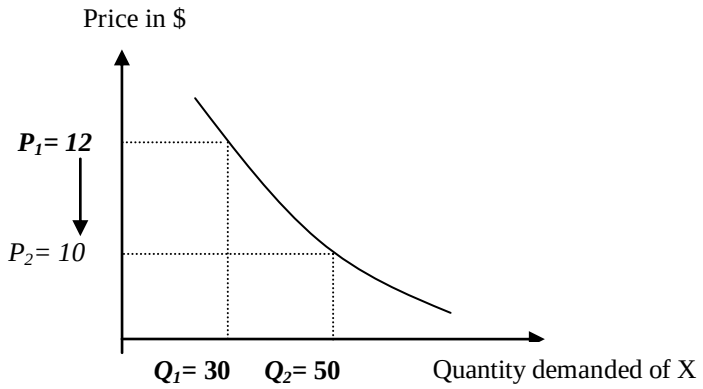


Fig. 4 Elasticity of demand

$$\varepsilon_p = \frac{\text{\% change in quantity demanded}}{\text{\% change in price}}$$

$$= \frac{[(Q_2 - Q_1)/Q_1] \times 100}{[(P_2 - P_1)/P_2] \times 100}$$

Where the pairs (Q_1, P_1) and (Q_2, P_2) represent respectively, the quantity and price values before and after their change.

Substituting the appropriate values into the formula gives:

$$\varepsilon_p = \frac{[(Q_2 - Q_1)/Q_1] \times 100}{[(P_2 - P_1)/P_2] \times 100} = \frac{(50 - 30)/30}{(10 - 12)/12} = -4.0$$

However, if we compute the sensitivity of the quantity demanded to an increase in price from \$10 to \$12 (equivalent to moving up the demand curve), the coefficient of price elasticity is

$$\varepsilon_p = \frac{[(Q_2 - Q_1)/Q_1] \times 100}{[(P_2 - P_1)/P_2] \times 100} = \frac{(30 - 50)/50}{(12 - 10)/10} = -2.0$$

The discrepancy in the two elasticiy coefficients arises because the percentage changes going from \$12 to \$10 are not the same as those from moving from \$10 to \$12. This is a troublesome matter but not without a remedy. The ambiquity of arbitrarily using one of the two points as the original or base values for calculating the percentage changes can be partially overcome by using averages of the quantity values as the base for calculating the percentage change in Q and the average of the two prices as the base for calculating the percenatge change in P. Making this adjustment gives the more satisfactory formula

$$\varepsilon_p = \frac{\dfrac{Q_2 - Q_1}{\left(\dfrac{Q_1 + Q_2}{2}\right)}}{\dfrac{P_2 - P_1}{\left(\dfrac{P_1 + P_2}{2}\right)}}$$

In terms of our previous example, the coefficient of price elasticity for a decline in price from \$12 to \$10 becomes;

$$\varepsilon_p = \frac{\dfrac{50-30}{\left(\dfrac{30+50}{2}\right)}}{\dfrac{10-12}{\left(\dfrac{12+10}{2}\right)}} = -2.75$$

A price elasticity of –2.75 should be interpreted as meaning that over the indicated range of prices and quantities, a 1% change in price will be followed by approximately a 2.75% change in quantity demanded in the opposite direction (verify that the same coefficient is obtained by moving from $10 to $12).

In general, the further apart the two points between which arc elasticity is computed, the greater is the discrepancy between the price elasticity coefficients obtained from the two-point arc formula.
Since the sign of the price elasticity of demand is always negative (in accordance with the law of demand), it is the size of the coefficient itself which is most relevant. By convention if:

$\varepsilon_p > 1$ demand is elastic (quantity demanded is sensitive to price changes)
$\varepsilon_p = 1$ demand is unitary or of unitary elasticity
$\varepsilon_p < 1$ demand is inelastic (quantity demanded is relatively unresponsive or insensitive to price changes.

Point Elasticity: Measuring elasticity at a point eliminates the imprecision of the arc elasticity concept. Point elasticity refers to the responsiveness of quantity demanded to very small price changes from a given point.

$$\varepsilon_p = \frac{\Delta Q/Q}{\Delta P/P} = \frac{\Delta Q}{Q} \cdot \frac{P}{\Delta P} = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

As the changes in price get smaller and smaller and actually approach zero, the ratio of $\Delta Q/\Delta P$ becomes equivalent to the derivative of the demand function with respect to price.

$$\lim_{\Delta P \to 0} \frac{\Delta Q}{\Delta P} = \frac{dQ}{dP}$$

Therefore the formula for point elasticity becomes

$$\varepsilon_p = \frac{dQ}{dP} \cdot \frac{P}{Q}$$

Similarly, the income elasticity may be derived as

$$\varepsilon_I = \frac{dQ}{dI} \cdot \frac{I}{Q}$$

Cross elasiticity of demand: Mineral commodities can be treated in three ways in as far as their demand is concerned:

i). They may be ***competing products or substitutes***. In this case an increase in the purchase of one is at the expense of the other. Consider plastics substituting metals in motor vehicles and construction.

ii). They may be ***complimentary products***, in which case an increase of one causes a rise in the purchase of another. Complimentary means that commodities are consumed together. Consider the demand for gemstones and gold in demand for jewellery.

iii). Commodities may be ***independent*** implying that the purchase of one mineral commodity has no direct bearing on the demand of another. In this case the commodities are neither consumed together nor in place of one another.

Cross elasticity of demand is a measure for interpreting the relationship between products. For two products X and Y, cross elasticity measures the percentatge change in the quantity demanded of product Y in response to a percentage change in the price of product X.

$$\varepsilon_{y\,x} = \frac{\%\text{ change in quantity of Y}}{\%\text{ change in price of X}}$$

Where $\varepsilon_{y\,x}$ is the coefficient of cross elasticity between X and Y. Again there are two ways of calculating the coefficient of cross elasticity of demand.

The arc formula is:

$$\varepsilon_{yx} = \frac{\dfrac{Q_{y2} - Q_{y1}}{\left[\dfrac{Q_{y1} + Q_{y2}}{2}\right]}}{\dfrac{P_{x2} - P_{x1}}{\left[\dfrac{P_{x1} + P_{x2}}{2}\right]}}$$

The point elasticity formula is

$$\varepsilon_{yx} = \frac{dQ_y}{dP_x} \cdot \frac{P_x}{Q_v}$$

The cross elasticity coefficient may be either positive or negative. Note that when

$\boldsymbol{\varepsilon_{yx} > 0}$	Commodities are substitutes
$\boldsymbol{\varepsilon_{yx} < 0}$	Commodities are complimentary
$\boldsymbol{\varepsilon_{yx} = 0}$	Commodities are independent

Partial Elasticities of Demand:

A more rigorous Concept of Demand Elasticity

In its most general form, the demand function for a good can be expressed as

$$Q_1 = f(P_1, P_2, \ldots\ldots\ldots P_n, T, I, E, R, N, O)$$

Where, Q_1 = quantity demanded of good 1
P_1 = market price of the good
P_2, ... P_n = prices of other goods
T = consumer tastes and preferences
I = Level of consumer incomes (or purchasing power)
E = consumer expectations about future prices, incomes and product availability
R = range of products available to consumers
N = number of potential consumers (market size)
O = all other factors which may influence Q_d

The elasticity of demand with respect to any demand determinant refers to the degree of responsivess of the quantity demanded relative to some percentage change in that demand determinant *when the values of all other demand determinants are held fixed.*

Determinants of Supply

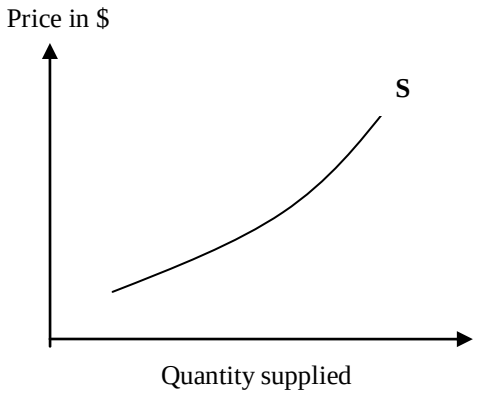


Fig. 5 Supply curve

The supply curve (S) in Fig. 5 represents the marginal cost curve for the industry supplying a particular mineral commodity. Conceptually, supply increases with increase in the market price of the commodity. This is expected because with an increase in the market price, some of the marginal deposits become viable and contribute to the expansion of supply. If the price falls on the market, some marginal mines will become unprofitable and forced to close down thereby reducing the overall supply. Thus the market mechanism regulates supply.

Factors affecting the supply of mineral commodities in the long term are:

- Major new discoveries
- Depletion
- Advance in processing technology (that has made it possible to process low grade ores or enhancement methods used in the treatment of low grade gemstones)
- Recycling (secondary supply)
- Enviromental controls
- Development of substitutes
- Development of new product markets

In the short-term, supply may be affected by:

- Labour strikes
- Changes in producer and consumer inventories
- Mine production cut-backs
- Government stockpiles
- Business cycles

In addition to changes in along the supply curve, there could be shifts in the supply curve.

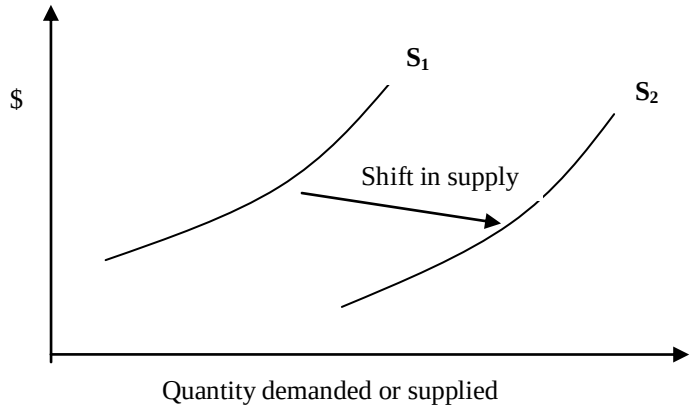


Fig. 6 Supply curve – shifts in supply

MINERAL MARKETS

We have already defined a market as a collection of individual decision making units, some of which desire to buy (demand) and some of which desire to sell (supply) a particular good or service.

In analysing the structure and functioning of markets, we shall first deal with a special kind of theoretical market model. It is a market that is both perfect and competitive.

Perfect Market:

Assumes that buyers and sellers have complete knowledge of market conditions, that any change in market conditions will be immediatelyknown and acted on.

Competitive Market:

The concept of a competitive market, like that of a perfect market, is an abstraction. The most important characteristic of a competitive market is that no single participant has power to affect the market outcome in an significant way. All participants are price takers and not price makers

The second characteristic of a competitive market is that there is no obstruction or restriction placed on supply (that is, no barriers to entry), demand or the level of price.

The final characteristic of a competitive market is that only one homogeneous commodity is sold in any given market.

The prime movers in our model are the forces of supply and demand. They determine the price of the good and the quantity exchanged in any given market.

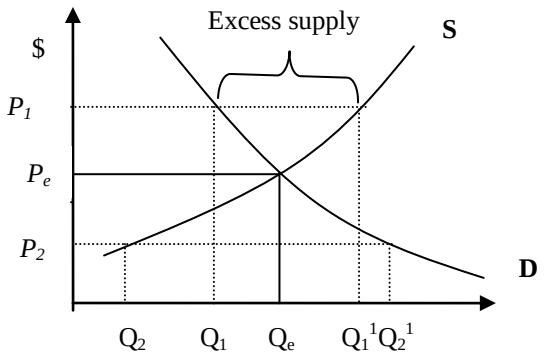


Fig. 7 Excess supplyemand curve – change in demand

At price P_1, the quantity supplied (Q_1^1) is greater than the quantity demanded (Q_1) by the market. Therefore there is excess supply that will result in forcing the price down because competitive price bidding by sellers will continue. Excess supply is (Q_1^1 - Q_1). Such a situation is a *buyers' market*. Similarly at a price P_2, the quantity demanded (Q_2^1) is greater than the quantity being supplied on the market. There is excess demand, a situation that will eventually force the price to move up because there will be competitive bidding by demanders. Buyers are the ones now scrambling and in the process force the price up – a situation which is favourable to sellers. Excess demand is (Q_2^1- Q_2).

At both prices (P_1 *and* P_2), the market is not in equilibrium. At a price P_e, the quantity supplied is equal to the quantity demanded by the market. The market is said to be *equilibrium.* The price P_e is the market equilibrium price. What conditions would facilitate the emergence of a black market?

However, all these changes affecting the demand and supply conditions are superiposed. All we actually see is the overall result.

TYPES OF MARKET POWER

There are three basic kinds of market power. Two of them deal with control over the supply or demand of a product. The third deals with control over its price.

Monopoly and Monopsony Power

To control the supply or demand of a good or service is to possess market power. Free markets are rigged and the market system obstructed when either or both of these forces are controlled. Those who control *supply*, who determine how much of a good or service is to be brought into the market, possess *monopoly power*. Those who control *demand*, who determine how much of a good or service will be taken off the market, possess *monopsony power*.

Market Structure and Market Power

Monopoly and monopsony result from a particular kind of market structure. Existence of either implies the absence of competition. Competitive markets have a unique set of buying and selling conditions:

- There are many independent buyers and sellers that no one can affect the price;
- The coomodity being exchange is homogeneous
- Business and households can enter or leave markets at will (no barrier to entry)

Indeed, a competitive market can be defined as one in which monopoly or monopsony power is non-existent. Each firm and each household is so minute compared to the market that no such power is possible.

In principle market structures range from an ideal case of perfect competitive market to a pure monopoly with intermediate market structures called ***oligopoly and monopolistic competition.*** Monopoly and Monopsony Power result from a particular kind of market structure. The existence of either monopoly and Monopsony implies the absence of competition.

Competitive markets, we have seen, have a unique set of conditions. There are so many independent buyers and sellers that no one can affect the price, commodity exchanged is homogeneous, and no barriers to entry.

The pure Monopoly Model

Pure monopoly lies at the opposite end of the spectrum from pure competition. Indeed, it implies the absence of everything for which pure competition stands. Whereas a competitive industry has a large number of firms producing the identical product, a monopolistic industry has but one. Consequently, while a single competitive firm cannot influence supply of goods coming onto a market, a monopolistic can. Firms move into and out of a competitive industry with ease, but entry into the monopolistic industry is effectively blocked. The competitive firm sees only the market price, is unable to affect it and consequently, seeks an optimum position by adjusting its output to that price. The monopolistic firm, on the other hand sees the entire market demand curve and is able to pick and choose the price and quantity that best serves its interests.
In monopoly, the equilibrium is not established in the market by impersonal forces. The monopolist has the power to regulate the flow of output coming onto the market and, with this power, he can set its price. He has the power to pick an equilibrium which is more beneficial to his private interests than the competitive equilibrium. As a rational producer, he chooses an equilibrium which maximises his profits. By restricting the amount which he suppplies, the monopolist can raise the price of the commodity. He secures a greater profit by producing a smaller output and selling it at a higher price than does a competitive industry.

Monopolistic Competition

In most real world markets, the products of firms are not homogeneous. Ordinarily, the product of each firm is in some way *differentiated* from the product of every other firm. In fact, most enterprises devote considerable time and effort to engineering special features into their products and to making their products unique through advertising, packaging, brand names, terms of credit, service , etc.

Monopolistic competition implies a market environment comprising many firms selling products that are very close (but not perfect) substitutes for each other.

Three factors combine to set monopolistic competition apart:

- Product differention
- presence of large numbers of sellers
- non price competition

Many Models of Oligopoly

To find any real-world industry with characteristics of either pure monopoly or pure competition is no easy task. The aluminum industry of a few decades ago was an example of a pure monopoly which effectively barred entry. It is no longer. The vast majority of contemporary industries lie some where between pure competition and pure monopoly, possessing elements of both.

Oligopoly is synonymous with competition among the few. Markets are said to be oligopolistic whenever a small number of firms supply the dominant share of an industry's output.

If the firms produce a standardized product, the industry is called a ***pure oligopoly***. Most common examples of virtually uniform products marketed under oligopoly include steel, aluminun, lead, copper, cement, explosives, fuel oil.

If a few firms dominate the market for a differentiated product, the industry is called a ***differentiated oligopoly***. Examples include the production of cars, TV sets, mobile phones, cigarettes, computers, soft drinks, etc. Entry into an oligopolistic industry is typically formidable. The most pervasive barrier to entry is the presence of substantial economies of scale.

Price leadership Models

Two major forms of price leadership stand out: *dominant firm leadership and barometric firm leadership.*

Dominant Firm Price leadership: A dominant firm establishes its own preferre price as the going market price and allows the competitive fringe firms to sell all they wish at that price.

Barometric Price leadership: Exists when there are several principal firms (surrounded or not, as the case may be, by a competitive fringe of small firms) and one of the large firms is not powerful enough to impose its will upon the other consistently. In copper, price leadership has been exercised by all the big three – Anaconda, Kennecott, and Phelps Dodge. US Steel, Bethlehem have exercised price leadership in steel.

CARTELS

This is an organisation established whose purpose is manupulate the price by controlling supply or demand. So there can be producer cartels and consumer cartels.

Examples of very successful producer cartels include:

OPEC – the Organization of Petroleum Exporting Countries comprising 12 countries is largely concentrated in the middle east.

The Organization of the Petroleum Exporting Countries (OPEC) is a permanent, intergovernmental Organization, created at the Baghdad Conference on September 10–14, 1960, by Iran, Iraq, Kuwait, Saudi Arabia and Venezuela. The five Founding Members were later joined by nine other Members: Qatar (1961); Indonesia (1962); Socialist Peoples Libyan Arab Jamahiriya (1962); United Arab Emirates (1967); Algeria (1969); Nigeria (1971); Ecuador (1973) – suspended its membership from December 1992-October 2007; Angola (2007) and Gabon (1975–1994). OPEC had its headquarters in Geneva, Switzerland, in the first five years of its existence. This was moved to Vienna, Austria, on September 1, 1965. Current membership stands at 12 countries

OPEC's objective is to co-ordinate and unify petroleum policies among Member Countries, in order to secure fair and stable prices for petroleum producers; an efficient, economic and regular supply of petroleum to consuming nations; and a fair return on capital to those investing in the industry.

OPEC FILE:

The 1960s

These were OPEC's formative years, with the Organization, which had started life as a group of five oil-producing, developing countries, seeking to assert its Member Countries' legitimate rights in an international oil market dominated by the 'Seven Sisters' multinational companies. Activities were generally of a low-profile nature, as OPEC set out its objectives, established its Secretariat, which moved from Geneva to Vienna in 1965, adopted resolutions and engaged in negotiations with the companies. Membership grew to ten during the decade.

The 1970s

OPEC rose to international prominence during this decade, as its Member Countries took control of their domestic petroleum industries and acquired a major say in the pricing of crude oil on world

markets. There were two oil pricing crises, triggered by the Arab oil embargo in 1973 and the outbreak of the Iranian Revolution in 1979, but fed by fundamental imbalances in the market; both resulted in oil prices rising steeply. The first Summit of OPEC Sovereigns and Heads of State was held in Algiers in March 1975. OPEC acquired its 11th Member, Nigeria, in 1971.

The 1980s

Prices peaked at the beginning of the decade, before beginning a dramatic decline, which culminated in a collapse in 1986 — the third oil pricing crisis. Prices rallied in the final years of the decade, without approaching the high levels of the early-1980s, as awareness grew of the need for joint action among oil producers if market stability with reasonable prices was to be achieved in the future. Environmental issues began to appear on the international agenda.

The 1990s

A fourth pricing crisis was averted at the beginning of the decade, on the outbreak of hostilities in the Middle East, when a sudden steep rise in prices on panic-stricken markets was moderated by output increases from OPEC Members. Prices then remained relatively stable until 1998, when there was a collapse, in the wake of the economic downturn in South-East Asia. Collective action by OPEC and some leading non-OPEC producers brought about a recovery. As the decade ended, there was a spate of mega-mergers among the major international oil companies in an industry that was experiencing major technological advances. For most of the 1990s, the ongoing international climate change negotiations threatened heavy decreases in future oil demand.

The cartel has been successful in manupulating supply through cut backs largely anchored on Saudi Arabian output. A key factor for the cartel's success lies on its lack of substitutes for oil and high concetration of production in a few countries.

Diamond Trading Company (DTC) – Company owned by De Beers. Established in July 2000 took over from Central Selling Organization (CSO). Controls over 80% of world's production.

Major reasons for DTC's successes as a cartel are:

- High concentration of production by De Beers own mines
- The diamonds area unique gemstone with no substitutes.
- It has a financial resource base to maintain buffer stocks that have helped stabilize prices in times of shortages or oversupply of diamonds.

DTC FILE

Have You Ever Tried to Sell a Diamond?

An unruly market may undo the work of a giant cartel and of an inspired, decades-long ad campaign

by Edward Jay Epstein

The author descending into a diamond mine in Kimberley, South Africa.

THE diamond invention -- the creation of the idea that diamonds are rare and valuable, and are essential signs of esteem -- is a relatively recent development in the history of the diamond trade. Until the late nineteenth century, diamonds were found only in a few riverbeds in India and in the jungles of Brazil, and the entire world production of gem diamonds amounted to a few pounds a year. In 1870, however, huge diamond mines were discovered near the Orange River, in South Africa, where diamonds were soon being scooped out by the ton. Suddenly, the market was deluged with diamonds. The British financiers who had organized the South African mines quickly realized that their investment was endangered; diamonds had little intrinsic value -- and their price depended almost entirely on their scarcity. The financiers feared that when new mines were developed in South Africa, diamonds would become at best only semiprecious gems.

The major investors in the diamond mines realized that they had no alternative but to merge their interests into a single entity that would be powerful enough to control production and perpetuate the illusion of scarcity of diamonds. The instrument they created, in 1888, was called De Beers Consolidated Mines, Ltd., incorporated in South Africa. As De Beers took control of all aspects of the world diamond trade, it assumed many forms. In London, it operated under the innocuous name of the Diamond

Trading Company. In Israel, it was known as "The Syndicate." In Europe, it was called the "C.S.O." -- initials referring to the Central Selling Organization, which was an arm of the Diamond Trading Company. And in black Africa, it disguised its South African origins under subsidiaries with names like Diamond Development Corporation and Mining Services, Inc. At its height -- for most of this century -- it not only either directly owned or controlled all the diamond mines in southern Africa but also owned diamond trading companies in England, Portugal, Israel, Belgium, Holland, and Switzerland.

De Beers proved to be the most successful cartel arrangement in the annals of modern commerce. While other commodities, such as gold, silver, copper, rubber, and grains, fluctuated wildly in response to economic conditions, diamonds have continued, with few exceptions, to advance upward in price every year since the Depression. Indeed, the cartel seemed so superbly in control of prices -- and unassailable -- that, in the late 1970s, even speculators began buying diamonds as a guard against the vagaries of inflation and recession. The diamond invention is far more than a monopoly for fixing diamond prices; it is a mechanism for converting tiny crystals of carbon into universally recognized tokens of wealth, power, and romance. To achieve this goal, De Beers had to control demand as well as supply. Both women and men had to be made to perceive diamonds not as marketable precious stones but as an inseparable part of courtship and married life. To stabilize the market, De Beers had to endow these stones with a sentiment that would inhibit the public from ever reselling them. The illusion had to be created that diamonds were forever -- "forever" in the sense that they should never be resold.

In September of 1938, Harry Oppenheimer, son of the founder of De Beers and then twenty-nine, traveled from Johannesburg to New York City, to meet with Gerold M. Lauck, the president of N. W. Ayer, a leading advertising agency in the United States. Lauck and N. W. Ayer had been recommended to Oppenheimer by the Morgan Bank, which had helped his father consolidate the De Beers financial empire. His bankers were concerned about the price of diamonds, which had declined worldwide.

In Europe, where diamond prices had collapsed during the Depression, there seemed little possibility of restoring public confidence in diamonds. In Germany, Austria, Italy, and Spain, the notion of giving a diamond ring to commemorate an engagement had never taken hold. In England and France, diamonds were still presumed to be jewels for aristocrats rather than the masses. Furthermore, Europe was on the verge of war, and there seemed little possibility of expanding diamond sales. This left the United States as the only real market for De Beers's diamonds. In fact, in 1938 some three quarters of the entire

cartel's diamonds were sold for engagement rings in the United States. Most of these stones, however, were smaller and of poorer quality than those bought in Europe, and had an average price of $80 apiece. Oppenheimer and the bankers believed that an advertising campaign could persuade Americans to buy more expensive diamonds.

Oppenheimer suggested to Lauck that his agency prepare a plan for creating a new image for diamonds among Americans. He assured Lauck that De Beers had not called on any other American advertising agency with this proposal, and that if the plan met with his father's approval, N. W. Ayer would be the exclusive agents for the placement of newspaper and radio advertisements in the United States. Oppenheimer agreed to underwrite the costs of the research necessary for developing the campaign. Lauck instantly accepted the offer.

In their subsequent investigation of the American diamond market, the staff of N. W. Ayer found that since the end of World War I, in 1919, the total amount of diamonds sold in America, measured in carats, had declined by 50 percent; at the same time, the quality of the diamonds, measured in dollar value, had declined by nearly 100 percent. An Ayer memo concluded that the depressed state of the market for diamonds was "the result of the economy, changes in social attitudes and the promotion of competitive luxuries."

Although it could do little about the state of the economy, N. W. Ayer suggested that through a well-orchestrated advertising and public-relations campaign it could have a significant impact on the "social attitudes of the public at large and thereby channel American spending toward larger and more expensive diamonds instead of "competitive luxuries." Specifically, the Ayer study stressed the need to strengthen the association in the public's mind of diamonds with romance. Since "young men buy over 90% of all engagement rings" it would be crucial to inculcate in them the idea that diamonds were a gift of love: the larger and finer the diamond, the greater the expression of love. Similarly, young women had to be encouraged to view diamonds as an integral part of any romantic courtship.

Since the Ayer plan to romanticize diamonds required subtly altering the public's picture of the way a man courts -- and wins -- a woman, the advertising agency strongly suggested exploiting the relatively new medium of motion pictures. Movie idols, the paragons of romance for the mass audience, would be given diamonds to use as their symbols of indestructible love.

In addition, the agency suggested offering stories and society photographs to selected magazines and newspapers which would

reinforce the link between diamonds and romance. Stories would stress the size of diamonds that celebrities presented to their loved ones, and photographs would conspicuously show the glittering stone on the hand of a well-known woman. Fashion designers would talk on radio programs about the "trend towards diamonds" that Ayer planned to start. The Ayer plan also envisioned using the British royal family to help foster the romantic allure of diamonds. An Ayer memo said, "Since Great Britain has such an important interest in the diamond industry, the royal couple could be of tremendous assistance to this British industry by wearing diamonds rather than other jewels." Queen Elizabeth later went on a well-publicized trip to several South African diamond mines, and she accepted a diamond from Oppenheimer.

In addition to putting these plans into action, N. W. Ayer placed a series of lush four-color advertisements in magazines that were presumed to mold elite opinion, featuring reproductions of famous paintings by such artists as Picasso, Derain, Dali, and Dufy. The advertisements were intended to convey the idea that diamonds, like paintings, were unique works of art.

BY 1941, The advertising agency reported to its client that it had already achieved impressive results in its campaign. The sale of diamonds had increased by 55 percent in the United States since 1938, reversing the previous downward trend in retail sales. N. W. Ayer noted also that its campaign had required "the conception of a new form of advertising which has been widely imitated ever since. There was no direct sale to be made. There was no brand name to be impressed on the public mind. There was simply an idea -- the eternal emotional value surrounding the diamond." It further claimed that "a new type of art was devised ... and a new color, diamond blue, was created and used in these campaigns.... "

In its 1947 strategy plan, the advertising agency strongly emphasized a psychological approach. "We are dealing with a problem in mass psychology. We seek to ... strengthen the tradition of the diamond engagement ring -- to make it a psychological necessity capable of competing successfully at the retail level with utility goods and services...." It defined as its target audience "some 70 million people 15 years and over whose opinion we hope to influence in support of our objectives." N. W. Ayer outlined a subtle program that included arranging for lecturers to visit high schools across the country. "All of these lectures revolve around the diamond engagement ring, and are reaching thousands of girls in their assemblies, classes and informal meetings in our leading educational institutions," the agency explained in a memorandum to De Beers. The agency had organized, in 1946, a weekly service called "Hollywood Personalities," which provided 125 leading newspapers with

descriptions of the diamonds worn by movie stars. And it continued its efforts to encourage news coverage of celebrities displaying diamond rings as symbols of romantic involvement. In 1947, the agency commissioned a series of portraits of "engaged socialites." The idea was to create prestigious "role models" for the poorer middle-class wage-earners. The advertising agency explained, in its 1948 strategy paper, "We spread the word of diamonds worn by stars of screen and stage, by wives and daughters of political leaders, by any woman who can make the grocer's wife and the mechanic's sweetheart say 'I wish I had what she has.'"

De Beers needed a slogan for diamonds that expressed both the theme of romance and legitimacy. An N. W. Ayer copywriter came up with the caption "A Diamond Is Forever," which was scrawled on the bottom of a picture of two young lovers on a honeymoon. Even though diamonds can in fact be shattered, chipped, discolored, or incinerated to ash, the concept of eternity perfectly captured the magical qualities that the advertising agency wanted to attribute to diamonds. Within a year, "A Diamond Is Forever" became the official motto of De Beers.

In 1951, N. W. Ayer found some resistance to its million-dollar publicity blitz. It noted in its annual strategy review:

The millions of brides and brides-to-be are subjected to at least two important pressures that work against the diamond engagement ring. Among the more prosperous, there is the sophisticated urge to be different as a means of being smart.... the lower-income groups would like to show more for the money than they can find in the diamond they can afford....

To remedy these problems, the advertising agency argued, "It is essential that these pressures be met by the constant publicity to show that only the diamond is everywhere accepted and recognized as the symbol of betrothal."

N. W. Ayer was always searching for new ways to influence American public opinion. Not only did it organize a service to "release to the women's pages the engagement ring" but it set about exploiting the relatively new medium of television by arranging for actresses and other celebrities to wear diamonds when they appeared before the camera. It also established a "Diamond Information Center" that placed a stamp of quasi-authority on the flood of "historical" data and "news" it released. "We work hard to keep ourselves known throughout the publishing world as the source of information on diamonds," N. W. Ayer commented in a memorandum to De Beers, and added: "Because we have done it successfully, we have opportunities to

help with articles originated by others."

N. W. Ayer proposed to apply to the diamond market Thorstein Veblen's idea, stated in The Theory of the Leisure Class, that Americans were motivated in their purchases not by utility but by "conspicuous consumption." "The substantial diamond gift can be made a more widely sought symbol of personal and family success -- an expression of socio-economic achievement," N. W. Ayer said in a report. To exploit this desire for conspicuous display, the agency specifically recommended, "Promote the diamond as one material object which can reflect, in a very personal way, a man's ... success in life." Since this campaign would be addressed to upwardly mobile men, the advertisements ideally "should have the aroma of tweed, old leather and polished wood which is characteristic of a good club."

Toward the end of the 1950s, N. W. Ayer reported to De Beers that twenty years of advertisements and publicity had had a pronounced effect on the American psyche. "Since 1939 an entirely new generation of young people has grown to marriageable age," it said. "To this new generation a diamond ring is considered a necessity to engagements by virtually everyone." The message had been so successfully impressed on the minds of this generation that those who could not afford to buy a diamond at the time of their marriage would "defer the purchase" rather than forgo it.

THE campaign to internationalize the diamond invention began in earnest in the mid-1960s. The prime targets were Japan, Germany, zand Brazil. Since N. W. Ayer was primarily an American advertising agency, De Beers brought in the J. Walter Thompson agency, which had especially strong advertising subsidiaries in the target countries, to place most of its international advertising. Within ten years, De Beers succeeded beyond even its most optimistic expectations, creating a billion-dollar-a-year diamond market in Japan, where matrimonial custom had survived feudal revolutions, world wars, industrialization, and even the American occupation.

Until the mid-1960s, Japanese parents arranged marriages for their children through trusted intermediaries. The ceremony was consummated, according to Shinto law, by the bride and groom drinking rice wine from the same wooden bowl. There was no tradition of romance, courtship, seduction, or prenuptial love in Japan; and none that required the gift of a diamond engagement ring. Even the fact that millions of American soldiers had been assigned to military duty in Japan for a decade had not created any substantial Japanese interest in giving diamonds as a token of love.

J. Walter Thompson began its campaign by suggesting that diamonds were a visible sign of modern Western values. It created a series of color advertisements in Japanese magazines showing beautiful women displaying their diamond rings. All the women had Western facial features and wore European clothes. Moreover, the women in most of the advertisements were involved in some activity -- such as bicycling, camping, yachting, ocean swimming, or mountain climbing -- that defied Japanese traditions. In the background, there usually stood a Japanese man, also attired in fashionable European clothes. In addition, almost all of the automobiles, sporting equipment, and other artifacts in the picture were conspicuous foreign imports. The message was clear: diamonds represent a sharp break with the Oriental past and a sign of entry into modern life.

The campaign was remarkably successful. Until1959, the importation of diamonds had not even been permitted by the postwar Japanese government. When the campaign began, in 1967, not quite 5 percent of engaged Japanese women received a diamond engagement ring. By 1972, the proportion had risen to 27 percent. By 1978, half of all Japanese women who were married wore a diamond; by 1981, some 60 percent of Japanese brides wore diamonds. In a mere fourteen years, the 1,500-year Japanese tradition had been radically revised. Diamonds became a staple of the Japanese marriage. Japan became the second largest market, after the United States, for the sale of diamond engagement rings.

In America, which remained the most important market for most of De Beer's diamonds, N. W. Ayer recognized the need to create a new demand for diamonds among long-married couples. "Candies come, flowers come, furs come," but such ephemeral gifts fail to satisfy a woman's psychological craving for "a renewal of the romance," N. W. Ayer said in a report. An advertising campaign could instill the idea that the gift of a second diamond, in the later years of marriage, would be accepted as a sign of "ever-growing love." In 1962, N. W. Ayer asked for authorization to "begin the long-term process of setting the diamond aside as the only appropriate gift for those later-in-life occasions where sentiment is to be expressed." De Beers immediately approved the campaign.

Have You Ever Tried to Sell a Diamond?

(Page 2)

by Edward Jay Epstein

THE diamond market had to be further restructured in the mid-1960s to accommodate a surfeit of minute diamonds, which De Beers undertook

to market for the Soviets. They had discovered diamond mines in Siberia, after intensive exploration, in the late 1950s: De Beers and its allies no longer controlled the diamond supply, and realized that open competition with the Soviets would inevitably lead, as Harry Oppenheimer gingerly put it, to "price fluctuations,"which would weaken the carefully cultivated confidence of the public in the value of diamonds. Oppenheimer, assuming that neither party could afford risking the destruction of the diamond invention, offered the Soviets a straightforward deal -- "a single channel" for controlling the world supply of diamonds. In accepting this arrangement, the Soviets became partners in the cartel, and co-protectors of the diamond invention.

Almost all of the Soviet diamonds were under half a carat in their uncut form, and there was no ready retail outlet for millions of such tiny diamonds. When it made its secret deal with the Soviet Union, De Beers had expected production from the Siberian mines to decrease gradually. Instead, production accelerated at an incredible pace, and De Beers was forced to reconsider its sales strategy. De Beers ordered N. W. Ayer to reverse one of its themes: women were no longer to be led to equate the status and emotional commitment to an engagement with the sheer size of the diamond. A "strategy for small diamond sales" was outlined, stressing the "importance of quality, color and cut" over size. Pictures of "one quarter carat" rings would replace pictures of "up to 2 carat" rings. Moreover, the advertising agency began in its international campaign to "illustrate gems as small as one-tenth of a carat and give them the same emotional importance as larger stones." The news releases also made clear that women should think of diamonds, regardless of size, as objects of perfection: a small diamond could be as perfect as a large diamond.

DeBeers devised the "eternity ring," made up of as many as twenty-five tiny Soviet diamonds, which could be sold to an entirely new market of older married women. The advertising campaign was based on the theme of recaptured love. Again, sentiments were born out of necessity: older American women received a ring of miniature diamonds because of the needs of a South African corporation to accommodate the Soviet Union.

The new campaign met with considerable success. The average size of diamonds sold fell from one carat in 1939 to .28 of a carat in 1976, which coincided almost exactly with the average size of the Siberian diamonds De Beers was distributing. However, as American consumers became accustomed to the idea of buying smaller diamonds, they began to perceive larger diamonds as ostentatious. By the mid-1970s, the advertising campaign for smaller diamonds was beginning to seem too successful. In its 1978 strategy report, N. W. Ayer said, "a supply problem has developed ... that has had a significant effect on diamond pricing" -- a problem caused by the long-term campaign to stimulate the sale of small diamonds. "Owing to successful pricing, distribution and advertising policies over the last 16 years, demand for small diamonds now appears to have significantly exceeded supply even though supply, in absolute terms, has been increasing steadily." Whereas there was not a sufficient supply of small diamonds to meet the demands of consumers, N. W. Ayer reported that "large stone sales (1 carat and up) ... have maintained the sluggish pace of the last three years." Because of this, the memorandum continued, "large stones are being discounted

by as much as 20%."

The shortage of small diamonds proved temporary. As Soviet diamonds continued to flow into London at an ever-increasing rate, De Beers's strategists came to the conclusion that this production could not be entirely absorbed by "eternity rings" or other new concepts in jewelry, and began looking for markets for miniature diamonds outside the United States. Even though De Beers had met with enormous success in creating an instant diamond "tradition" in Japan, it was unable to create a similar tradition in Brazil, Germany, Austria, or Italy. By paying the high cost involved in absorbing this flood of Soviet diamonds each year, De Beers prevented -- at least temporarily -- the Soviet Union from taking any precipitous actions that might cause diamonds to start glutting the market. N. W. Ayer argued that "small stone jewelry advertising" could not be totally abandoned: "Serious trade relationship problems would ensue if, after15 years of stressing 'affordable' small stone jewelry, we were to drop all of these programs."

Instead, the agency suggested a change in emphasis in presenting diamonds to the American public. In the advertisements to appear in 1978, it planned to substitute photographs of one-carat-and-over stones for photographs of smaller diamonds, and to resume both an "informative advertising campaign" and an "emotive program" that would serve to "reorient consumer tastes and price perspectives towards acceptance of solitaire [single-stone] jewelry rather than multi-stone pieces." Other "strategic refinements" it recommended were designed to restore the status of the large diamond. "In fact, this [campaign] will be the exact opposite of the small stone informative program that ran from 1965 to 1970 that popularized the 'beauty in miniature' concept...." With an advertising budget of some $9.69 million, N. W. Ayer appeared confident that it could bring about this "reorientation."

N. W. Ayer learned from an opinion poll it commissioned from the firm of Daniel Yankelovich, Inc. that the gift of a diamond contained an important element of surprise. "Approximately half of all diamond jewelry that the men have given and the women have received were given with zero participation or knowledge on the part of the woman recipient," the study pointed out. N. W Ayer analyzed this "surprise factor":

Women are in unanimous agreement that they want to be surprised with gifts.... They want, of course, to be surprised for the thrill of it. However, a deeper, more important reason lies behind this desire.... "freedom from guilt." Some of the women pointed out that if their husbands enlisted their help in purchasing a gift (like diamond jewelry), their practical nature would come to the fore and they would be compelled to object to the purchase.

Women were not totally surprised by diamond gifts: some 84 percent of the men in the study "knew somehow" that the women wanted diamond jewelry. The study suggested a two-step "gift-process continuum": first, "the man 'learns' diamonds are o.k." from the woman; then, "at some later point in time, he makes the diamond purchase decision" to surprise the woman.

Through a series of "projective" psychological questions, meant "to draw out a respondent's innermost feelings about diamond jewelry," the study attempted to examine further the semi-passive role played by women in receiving diamonds. The male-female roles seemed to resemble closely the sex relations in a Victorian novel. "Man plays the dominant, active role in the gift process. Woman's role is more subtle, more oblique, more enigmatic...." The woman seemed to believe there was something improper about receiving a diamond gift. Women spoke in interviews about large diamonds as "flashy, gaudy, overdone" and otherwise inappropriate. Yet the study found that "Buried in the negative attitudes ... lies what is probably the primary driving force for acquiring them. Diamonds are a traditional and conspicuous signal of achievement, status and success." It noted, for example, "A woman can easily feel that diamonds are 'vulgar' and still be highly enthusiastic about receiving diamond jewelry." The element of surprise, even if it is feigned, plays the same role of accommodating dissonance in accepting a diamond gift as it does in prime sexual seductions: it permits the woman to pretend that she has not actively participated in the decision. She thus retains both her innocence -- and the diamond.

For advertising diamonds in the late 1970s, the implications of this research were clear. To induce men to buy diamonds for women, advertising should focus on the emotional impact of the "surprise" gift transaction. In the final analysis, a man was moved to part with earnings not by the value, aesthetics, or tradition of diamonds but by the expectation that a "gift of love" would enhance his standing in the eyes of a woman. On the other hand, a woman accepted the gift as a tangible symbol of her status and achievements.

By 1979, N. W. Ayer had helped De Beers expand its sales of diamonds in the United States to more than $2.1 billion, at the wholesale level, compared with a mere $23 million in 1939. In forty years, the value of its sales had increased nearly a hundredfold. The expenditure on advertisements, which began at a level of only $200,000 a year and gradually increased to $10 million, seemed a brilliant investment.

EXCEPT for those few stones that have been destroyed, every diamond that has been found and cut into a jewel still exists today and is literally in the public's hands. Some hundred million women wear diamonds, while millions of others keep them in safe-deposit boxes or strongboxes as family heirlooms. It is conservatively estimated that the public holds more than 500 million carats of gem diamonds, which is more than fifty times the number of gem diamonds produced by the diamond cartel in any given year. Since the quantity of diamonds needed for engagement rings and other jewelry each year is satisfied by the production from the world's mines, this half-billion-carat supply of diamonds must be prevented from ever being put on the market. The moment a significant portion of the public begins selling diamonds from this inventory, the price of diamonds cannot be sustained. For the diamond invention to survive, the public must be inhibited from ever parting with its diamonds.

In developing a strategy for De Beers in 1953, N. W. Ayer said: "In our opinion old diamonds are in 'safe hands' only when widely dispersed and held by individuals as cherished possessions valued far above their market price." As far as De Beers and N. W. Ayer were concerned, "safe

hands" belonged to those women psychologically conditioned never to sell their diamonds. This conditioning could not be attained solely by placing advertisements in magazines. The diamond-holding public, which includes people who inherit diamonds, had to remain convinced that diamonds retained their monetary value. If it saw price fluctuations in the diamond market and attempted to dispose of diamonds to take advantage of changing prices, the retail market would become chaotic. It was therefore essential that De Beers maintain at least the illusion of price stability.

In the 1971 De Beers annual report, Harry Oppenheimer explained the unique situation of diamonds in the following terms: "A degree of control is necessary for the well-being of the industry, not because production is excessive or demand is falling, but simply because wide fluctuations in price, which have, rightly or wrongly, been accepted as normal in the case of most raw materials, would be destructive of public confidence in the case of a pure luxury such as gem diamonds, of which large stocks are held in the form of jewelry by the general public." During the periods when production from the mines temporarily exceeds the consumption of diamonds -- the balance is determined mainly by the number of impending marriages in the United States and Japan -- the cartel can preserve the illusion of price stability by either cutting back the distribution of diamonds at its London "sights," where, ten times a year, it allots the world's supply of diamonds to about 300 hand-chosen dealers, called "sight-holders," or by itself buying back diamonds at the wholesale level. The underlying assumption is that as long as the general public never sees the price of diamonds fall, it will not become nervous and begin selling its diamonds. If this huge inventory should ever reach the market, even De Beers and all the Oppenheimer resources could not prevent the price of diamonds from plummeting.

Selling individual diamonds at a profit, even those held over long periods of time, can be surprisingly difficult. For example, in 1970, the London-based consumer magazine Money Which? decided to test diamonds as a decade long investment. It bought two gem-quality diamonds, weighing approximately one-half carat apiece, from one of London's most reputable diamond dealers, for £400 (then worth about a thousand dollars). For nearly nine years, it kept these two diamonds sealed in an envelope in its vault. During this same period, Great Britain experienced inflation that ran as high as 25 percent a year. For the diamonds to have kept pace with inflation, they would have had to increase in value at least 300 percent, making them worth some £400 pounds by 1978. But when the magazine's editor, Dave Watts, tried to sell the diamonds in 1978, he found that neither jewelry stores nor wholesale dealers in London's Hatton Garden district would pay anywhere near that price for the diamonds. Most of the stores refused to pay any cash for them; the highest bid Watts received was £500, which amounted to a profit of only £100 in over eight years, or less than 3 percent at a compound rate of interest. If the bid were calculated in 1970 pounds, it would amount to only £167. Dave Watts summed up the magazine's experiment by saying, "As an 8-year investment the diamonds that we bought have proved to be very poor." The problem was that the buyer, not the seller, determined the price.

The magazine conducted another experiment to determine the extent to which larger diamonds appreciate in value over a one-year period. In

1970, it bought a 1.42 carat diamond for £745. In 1971, the highest offer it received for the same gem was £568. Rather than sell it at such an enormous loss, Watts decided to extend the experiment until 1974, when he again made the round of the jewelers in Hatton Garden to have it appraised. During this tour of the diamond district, Watts found that the diamond had mysteriously shrunk in weight to 1.04 carats. One of the jewelers had apparently switched diamonds during the appraisal. In that same year, Watts, undaunted, bought another diamond, this one 1.4 carats, from a reputable London dealer. He paid £2,595. A week later, he decided to sell it. The maximum offer he received was £1,000.

In 1976, the Dutch Consumer Association also tried to test the price appreciation of diamonds by buying a perfect diamond of over one carat in Amsterdam, holding it for eight months, and then offering it for sale to the twenty leading dealers in Amsterdam. Nineteen refused to buy it, and the twentieth dealer offered only a fraction of the purchase price.

Selling diamonds can also be an extraordinarily frustrating experience for private individuals. In 1978, for example, a wealthy woman in New York City decided to sell back a diamond ring she had bought from Tiffany two years earlier for $100,000 and use the proceeds toward a necklace of matched pearls that she fancied. She had read about the "diamond boom" in news magazines and hoped that she might make a profit on the diamond. Instead, the sales executive explained, with what she said seemed to be a touch of embarrassment, that Tiffany had "a strict policy against repurchasing diamonds." He assured her, however, that the diamond was extremely valuable, and suggested another Fifth Avenue jewelry store. The woman went from one leading jeweler to another, attempting to sell her diamond. One store offered to swap it for another jewel, and two other jewelers offered to accept the diamond "on consignment" and pay her a percentage of what they sold it for, but none of the half-dozen jewelers she visited offered her cash for her $100,000 diamond. She finally gave up and kept the diamond.

Retail jewelers, especially the prestigious Fifth Avenue stores, prefer not to buy back diamonds from customers, because the offer they would make would most likely be considered ridiculously low. The "keystone," or markup, on a diamond and its setting may range from 100 to 200 percent, depending on the policy of the store; if it bought diamonds back from customers, it would have to buy them back at wholesale prices. Most jewelers would prefer not to make a customer an offer that might be deemed insulting and also might undercut the widely held notion that diamonds go up in value. Moreover, since retailers generally receive their diamonds from wholesalers on consignment, and need not pay for them until they are sold, they would not readily risk their own cash to buy diamonds from customers. Rather than offer customers a fraction of what they paid for diamonds, retail jewelers almost invariably recommend to their clients firms that specialize in buying diamonds "retail."

The firm perhaps most frequently recommended by New York jewelry shops is Empire Diamonds Corporation, which is situated on the sixty-sixth floor of the Empire State Building, in midtown Manhattan. Empire's reception room, which resembles a doctor's office, is usually crowded with elderly women who sit nervously in plastic chairs waiting for their names to be called. One by one, they are ushered into a small

examining room, where an appraiser scrutinizes their diamonds and makes them a cash offer. "We usually can't pay more than a maximum of 90 percent of the current wholesale price," says Jack Brod, president of Empire Diamonds. "In most cases we have to pay less, since the setting has to be discarded, and we have to leave a margin for error in our evaluation -- especially if the diamond is mounted in a setting." Empire removes the diamonds from their settings, which are sold as scrap, and resells them to wholesalers. Because of the steep markup on diamonds, individuals who buy retail and in effect sell wholesale often suffer enormous losses. For example, Brod estimates that a half-carat diamond ring, which might cost $2,000 at a retail jewelry store, could be sold for only $600 at Empire.

The appraisers at Empire Diamonds examine thousands of diamonds a month but rarely turn up a diamond of extraordinary quality. Almost all the diamonds they find are slightly flawed, off-color, commercial-grade diamonds. The chief appraiser says, "When most of these diamonds were purchased, American women were concerned with the size of the diamond, not its intrinsic quality." He points out that the setting frequently conceals flaws, and adds, "The sort of flawless, investment-grade diamond one reads about is almost never found in jewelry."

Many of the elderly women who bring their jewelry to Empire Diamonds and other buying services have been victims of burglaries or muggings and fear further attempts. Thieves, however, have an even more difficult time selling diamonds than their victims. When suspicious-looking characters turn up at Empire Diamonds, they are asked to wait in the reception room, and the police are called in. In January of 1980, for example, a disheveled youth came into Empire with a bag full of jewelry that he called "family heirlooms." When Brod pointed out that a few pieces were imitations, the youth casually tossed them into the wastepaper basket. Brod buzzed for the police.

When thieves bring diamonds to underworld "fences," they usually get only a pittance for them. In 1979, for example, New York City police recovered stolen diamonds with an insured value of $50,000 which had been sold to a 'fence' for only $200. According to the assistant district attorney who handled the case, the fence was unable to dispose of the diamonds on 47th Street, and he was eventually turned in by one of the diamond dealers he contacted.

While those who attempt to sell diamonds often experience disappointment at the low price they are offered, stories in gossip columns suggest that diamonds are resold at enormous profits. This is because the column items are not about the typical diamond ring that a woman desperately attempts to peddle to small stores and diamond buying services like Empire but about truly extraordinary diamonds that movie stars sell, or claim to sell, in a publicity-charged atmosphere. The legend created around the so-called "Elizabeth Taylor" diamond is a case in point. This pear-shaped diamond, which weighed 69.42 carats after it had been cut and polished, was the fifty-sixth largest diamond in the world and one of the few large-cut diamonds in private hands. Except that it was a diamond, it had little in common with the millions of small stones that are mass-marketed each year in engagement rings and

other jewelry

Have You Ever Tried to Sell a Diamond?

(Page 3)

by Edward Jay Epstein

A serious threat to the Stability of the diamond invention came in the late 1970s from the sale of "investment" diamonds to speculators in the United States. A large number of fraudulent investment firms, most of them in Arizona, began telephoning prospective clients drawn from various lists of professionals and investors who had recently sold stock. "Boiler-room operators," many of them former radio and television announcers, persuaded strangers to buy mail-order diamonds as investments that were supposedly much safer than stocks or bonds. Many of the newly created firms also held "diamond-investment seminars" in expensive resort hotels, where they presented impressive graphs and data. Typically assisted by a few well-rehearsed shills in the audience, the seminar leaders sold sealed packets of diamonds to the audience. The leaders often played on the fear of elderly investors that their relatives might try to seize their cash assets and commit them to nursing homes. They suggested that the investors could stymie such attempts by putting their money into diamonds and hiding them.

The sealed packets distributed at these seminars and through the mail included certificates guaranteeing the quality of the diamonds -- as long as the packets remained sealed. Customers who broke the seal often learned from independent appraisers that their diamonds were of a quality inferior to that stated. Many were worthless. Complaints proliferated so fast that, in 1978, the attorney general of New York created a "diamond task force" to investigate the hundreds of allegations of fraud.

Some of the entrepreneurs were relative newcomers to the diamond business. Rayburne Martin, who went from De Beers Diamond Investments, Ltd. (no relation to the De Beers cartel) to Tel-Aviv Diamond Investments, Ltd. -- both in Scottsdale, Arizona -- had a record of embezzlement and securities law violations in Arkansas, and was a fugitive from justice during most of his tenure in the diamond trade. Harold S. McClintock, also known as Harold Sager, had been convicted of stock fraud in Chicago and involved in a silver-bullion-selling caper in 1974 before he helped organize DeBeers Diamond Investments, Ltd. Don Jay Shure, who arranged to set up another DeBeers Diamond Investments, Ltd., in Irvine, California, had also formerly been convicted of fraud. Bernhard Dohrmann, the "marketing

director" of the International Diamond Corporation, had served time in jail for security fraud in 1976. Donald Nixon, the nephew of former President Richard M. Nixon, and fugitive financier Robert L. Vesco were, according to the New York State attorney general, participating in the late 1970s in a high-pressure telephone campaign to sell "overvalued or worthless diamonds" by employing "a battery of silken-voiced radio and television announcers." Among the diamond salesmen were also a wide array of former commodity and stock brokers who specialized in attempting to sell sealed diamonds to pension funds and retirement plans.

In London, the real De Beers, unable to stifle all the bogus entrepreneurs using its name, decided to explore the potential market for investment gems. It announced in March of 1978 a highly unusual sort of "diamond fellowship" for selected retail jewelers. Each jeweler who participated would pay a $2,000 fellowship fee. In return, he would receive a set of certificates for investment-grade diamonds, contractual forms for "buy-back" guarantees, promotional material, and training in how to sell these unmounted diamonds to an entirely new category of customers. The selected retailers would then sell loose stones rather than fine jewels, with certificates guaranteeing their value at $4,000 to $6,000.

De Beers's modest move into the investment-diamond business caused a tremor of concern in the trade. De Beers had always strongly opposed retailers selling "investment" diamonds, on the grounds that because customers had no sentimental attachment to such diamonds, they would eventually attempt to resell them and cause sharp price fluctuations.

If De Beers had changed its policy toward investment diamonds, it was not because it wanted to encourage the speculative fever that was sweeping America and Europe. De Beers had "little choice but to get involved," as one De Beers executive explained. Many established diamond dealers had rushed into the investment field to sell diamonds to financial institutions, pension plans, and private investors. It soon became apparent in the Diamond Exchange in New York that selling unmounted diamonds to investors was far more profitable than selling them to jewelry shops. By early 1980, David Birnbaum, a leading dealer in New York, estimated that nearly a third of all diamond sales in the United States were, in terms of dollar value, of these unmounted investment diamonds. "Only five years earlier, investment diamonds were only an insignificant part of the business," he said. Even if De Beers did not approve of this new market in diamonds, it could hardly ignore a third of the American diamond trade.

To make a profit, investors must at some time find buyers who are willing to pay more for their diamonds than they did. Here, however, investors face the same problem as those attempting to sell their jewelry: there is no unified market in which to sell diamonds. Although dealers will quote the prices at which they are willing to sell investment-grade diamonds, they seldom give a set price at which they are willing to buy diamonds of the same grade. In 1977, for example, Jewelers' Circular Keystone polled a large number of retail dealers and found a difference of over 100 percent in offers for the same quality of investment-grade diamonds. Moreover, even though most investors buy their diamonds at or near retail price, they are forced to sell at

wholesale prices. As Forbes magazine pointed out, in 1977, "Average investors, unfortunately, have little access to the wholesale market. Ask a jeweler to buy back a stone, and he'll often begin by quoting a price 30% or more below wholesale." Since the difference between wholesale and retail is usually at least 100 percent in investment diamonds, any gain from the appreciation of the diamonds will probably be lost in selling them.

"There's going to come a day when all those doctors, lawyers, and other fools who bought diamonds over the phone take them out of their strongboxes, or wherever, and try to sell them," one dealer predicted last year. Another gave a gloomy picture of what would happen if this accumulation of diamonds were suddenly sold by speculators. "Investment diamonds are bought for $30,000 a carat, not because any woman wants to wear them on her finger but because the investor believes they will be worth $50,000 a carat. He may borrow heavily to leverage his investment. When the price begins to decline, everyone will try to sell their diamonds at once. In the end, of course, there will be no buyers for diamonds at $30,000 a carat or even $15,000. At this point, there will be a stampede to sell investment diamonds, and the newspapers will begin writing stories about the great diamond crash. Investment diamonds constitute, of course, only a small fraction of the diamonds held by the public, but when women begin reading about a diamond crash, they will take their diamonds to retail jewelers to be appraised and find out that they are worth less than they paid for them. At that point, people will realize that diamonds are not forever, and jewelers will be flooded with customers trying to sell, not buy, diamonds. That will be the end of the diamond business."

BUT a panic on the part of investors is not the only event that could end the diamond business. De Beers is at this writing losing control of several sources of diamonds that might flood the market at any time, deflating forever the price of diamonds.

In the winter of 1978, diamond dealers in New York City were becoming increasingly concerned about the possibility of a serious rupture, or even collapse, of the "pipeline" through which De Beers's diamonds flow from the cutting centers in Europe to the main retail markets in America and Japan. This pipeline, a crucial component of the diamond invention, is made up of a network of brokers, diamond cutters, bankers, distributors, jewelry manufacturers, wholesalers, and diamond buyers for retail establishments. Most of the people in this pipeline are Jewish, and virtually all are closely interconnected, through family ties or long-standing business relationships.

An important part of the pipeline goes from London to diamond-cutting factories in Tel Aviv to New York; but in Israel, diamond dealers were stockpiling supplies of diamonds rather than processing and passing them through the pipeline to New York. Since the early 1970s, when diamond prices were rapidly increasing and Israeli currency was depreciating by more than 50 percent a year, it had been more profitable for Israeli dealers to keep the diamonds they received from London than to cut and sell them. As more and more diamonds were taken out of circulation in Tel Aviv, an acute shortage began in New

York, driving prices up.

In early 1977, Sir Philip Oppenheimer dispatched his son Anthony to Tel Aviv, accompanied by other De Beers executives, to announce that De Beers intended to cut the Israeli quota of diamonds by at least 20 percent during the coming year. This warning had the opposite effect of what he intended. Rather than paring down production to conform to this quota, Israeli manufacturers and dealers began building up their own stockpiles of diamonds, paying a premium of 100 percent or more for the unopened boxes of diamonds that De Beers shipped to Belgian and American dealers. (By selling their diamonds to the Israelis, the De Beers clients could instantly double their money without taking any risks.) Israeli buyers also moved into Africa and began buying directly from smugglers. The Intercontinental Hotel in Liberia, then the center for the sale of smuggled goods, became a sort of extension of the Israeli bourse. After the Israeli dealers purchased the diamonds, either from De Beers clients or from smugglers, they received 80 percent of the amount they had paid in the form of a loan from Israeli banks. Because of government pressure to help the diamond industry, the banks charged only 6 percent interest on these loans, well below the rate of inflation in Israel. By 1978, the banks had extended $850 million in credit to diamond dealers, an amount equal to some 5 percent of the entire gross national product of Israel. The only collateral the banks had for these loans was uncut diamonds.

De Beers estimated that the Israeli stockpile was more than 6 million carats in 1977, and growing at a rate of almost half a million carats a month. At that rate, it would be only a matter of months before the Israeli stockpile would exceed the cartels in London. If Israel controlled such an enormous quantity of diamonds, the cartel could no longer fix the price of diamonds with impunity. At any time, the Israelis could be forced to pour these diamonds onto the world market. The cartel decided that it had no alternative but to force liquidation of the Israeli stockpile.

If De Beers wanted to bring the diamond speculation under control, it would have to clamp down on the banks, which were financing diamond purchases with artificially low interest rates. De Beers announced that it was adopting a new strategy of imposing "surcharges" on diamonds. Since these "surcharges," which might be as much as 40 percent of the value of the diamonds, were effectively a temporary price increase, they could pose a risk to banks extending credit to diamond dealers. For example, with a 40 percent surcharge, a diamond dealer would have to pay $1,400 rather than $1,000 for a small lot of diamonds; however, if the surcharge was withdrawn, the diamonds would be worth only a thousand dollars. The Israeli banks could not afford to advance 80 percent of a purchase price that included the so-called surcharge; they therefore required additional collateral from dealers and speculators. Further, they began, under pressure from De Beers, to raise interest rates on outstanding loans.

Within a matter of weeks in the summer of 1978, interest rates on loans to purchase diamonds went up 50 percent. Moreover, instead of lending money based on what Israeli dealers paid for diamonds, the banks began basing their loans on the official De Beers price for diamonds. If a dealer paid more than the De Beers price for diamonds -- and most

Israeli dealers were paying at least double the price -- he would have to finance the increment with his own funds.

To tighten the squeeze on Israel, De Beers abruptly cut off shipments of diamonds to forty of its clients who had been selling large portions of their consignments to Israeli dealers. As Israeli dealers found it increasingly difficult either to buy or finance diamonds, they were forced to sell diamonds from the stockpiles they had accumulated. Israeli diamonds poured onto the market, and prices at the wholesale level began to fall. This decline led the Israeli banks to put further pressure on dealers to liquidate their stocks to repay their loans. Hundreds of Israeli dealers, unable to meet their commitments, went bankrupt as prices continued to plunge. The banks inherited the diamonds.

Last spring, executives of the Diamond Trading Company made an emergency trip to Tel Aviv. They had been informed that three Israeli banks were holding $1.5 billion worth of diamonds in their vaults -- an amount equal to nearly the annual production of all the diamond mines in the world -- and were threatening to dump the hoard of diamonds onto an already depressed market. When the banks had investigated the possibilities of reselling the diamonds in Europe or the United States, they found little interest. The world diamond market was already choked with uncut and unsold diamonds. The only alternative to dumping their diamonds on the market was reselling them to De Beers itself.

De Beers, however, is in no position to absorb such a huge cache of diamonds. During the recession of the mid-970s, it had to use a large portion of its cash reserve to buy diamonds from Russia and from newly independent countries in Africa, in order to preserve the cartel arrangement. As it added diamonds to its stockpile, De Beers depleted its cash reserves. Furthermore, in 1980, De Beers found it necessary to buy back diamonds on the wholesale markets in Antwerp to prevent a complete collapse in diamond prices. When the Israeli banks approached De Beers about the possibility of buying back the diamonds, De Beers, possibly for the first time since the depression of the 1930s, found itself severely strapped for cash. It could, of course, borrow the $1.5 billion necessary to bail out the Israeli banks, but this would strain the financial structure of the entire Oppenheimer empire.

Sir Philip Oppenheimer, Monty Charles, Michael Grantham, and other top executives from De Beers and its subsidiaries attempted to prevent the Israeli banks from dumping their hoard of diamonds. Despite their best efforts, however, the situation worsened. Last September, Israel's major banks quietly informed the Israeli government that they faced losses of disastrous proportions from defaulted accounts almost entirely collateralized with diamonds. Three of Israel's largest banks -- the Union Bank of Israel, the Israel Discount Bank, and Barclays Discount Bank -- had loans of some $660 million outstanding to diamond dealers, which constituted a significant portion of the bank debt in Israel. To be sure, not all of these loans were in jeopardy; but, according to bank estimates, defaults in diamond accounts rose to 20 percent of their loan portfolios. The crisis had to be resolved either by selling the diamonds that had been put up as collateral, which might precipitate a worldwide selling panic, or by some sort of outside assistance from the Israeli government or De Beers or both. The negotiations provided only stopgap assistance: De Beers would buy back a small proportion of the

diamonds, and the Israeli government would not force the banks to conform to banking regulations that would result in the liquidation of the stockpile.

"Nobody took into account that diamonds, like any other commodity, can drop in value," Mark Mosevics, chairman of First International Bank of Israel, explained to The New York Times. According to industry estimates, the average one-carat flawless diamond had fallen in value by 50 percent since January of 1980. In March of 1980, for example, the benchmark value for such a diamond was $63,000; in September of 1981, it was only $23,000. This collapse of prices forced Israeli banks to sell diamonds from their stockpile at enormous discounts. One Israeli bank reportedly liquidated diamonds valued at $6 million for $4 million in cash in late 1981. It became clear to the diamond trade that a major stockpile of large diamonds was out of De Beers's control.

THE most serious threat to De Beers is yet another source of diamonds that it does not control -- a source so far untapped. Since Cecil Rhodes and the group of European bankers assembled the components of the diamond invention at the end of the nineteenth century, managers of the diamond cartel have shared a common nightmare -- that a giant new source of diamonds would be discovered outside their purview. Sir Ernest Oppenheimer, using all the colonial connections of the British Empire, succeeded in weaving the later discoveries of diamonds in Africa into the fabric of the cartel; Harry Oppenheimer managed to negotiate a secret agreement that effectively brought the Soviet Union into the cartel. However, these brilliant efforts did not end the nightmare. In the late 1970s, vast deposits of diamonds were discovered in the Argyle region of Western Australia, near the town of Kimberley (coincidentally named after Kimberley, South Africa). Test drillings last year indicated that these pipe mines could produce up to 50 million carats of diamonds a year -- more than the entire production of the De Beers cartel in 1981. Although only a small percentage of these diamonds are of gem quality, the total number produced would still be sufficient to change the world geography of diamonds. Either this 50 million carats would be brought under control or the diamond invention would be destroyed.

De Beers rapidly moved to get a stranglehold on the Australian diamonds. It began by acquiring a small, indirect interest in Conzinc Riotinto of Australia, Ltd. (CRA), the company that controlled most of the mining rights. In 1980, it offered a secret deal to CRA through which it would market the total output of Australian production. This agreement might have ended the Australian threat if Northern Mining Corporation, a minority partner in the venture, had accepted the deal. Instead, Northern Mining leaked the terms of the deal to a leading Australian newspaper, which reported that De Beers planned to pay the Australian consortium 80 percent less than the existing market price for the diamonds. This led to a furor in Australia. The opposition Labour Party charged not only that De Beers was seeking to cheat Australians out of the true value of the diamonds but that the deal with De Beers would support the policy of apartheid in South Africa. It demanded that the government impose export controls on the diamonds rather than allow them to be controlled by a South African corporation. Prime Minister Malcolm Fraser, faced with a storm of public protest, said that he saw no advantage in "arrangements in which Australian diamond discoveries only serve to strengthen a South African monopoly." He left

the final decision on marketing, however, to the Western Australia state government and the mining companies, which may or may not decide to make an arrangement with De Beers.

De Beers also faces a crumbling empire in Zaire. Sir Ernest Oppenheimer had concluded, more than fifty years ago, that control over the diamond mines in Zaire (then called the Belgian Congo) was the key to the cartel's control of world production. De Beers, together with its Belgian partners, had instituted mining and sorting procedures that would maximize the production of industrial (rather than gem) diamonds. Since there was no other ready customer for the enormous quantities of industrial diamonds the Zairian mines produced, De Beers remained their only outlet. In June of last year, however, President Mobuto abruptly announced that his country's exclusive contract with a De Beers subsidiary would not be renewed. Mobuto was reportedly influenced by offers he received for Zaire's diamond production from both Indian and American manufacturers. According to one New York diamond dealer, "Mobuto simply wants a more lucrative deal." Whatever his motives, the sudden withdrawal of Zaire from the cartel further undercuts the stability of the diamond market. With increasing pressure for the independence of Namibia, and a less friendly government in neighboring Botswana, De Beers's days of control in black Africa seem numbered.

Even in the midst of this crisis, De Beers's executives in London have been maneuvering to save the diamond invention by buying up loose diamonds. The inventory of diamonds in De Beers's vault has swollen to a value of over a billion dollars -- twice the value of the 1979 inventory. To rekindle the demand for diamonds, De Beers recently launched a new multimillion-dollar advertising campaign (including $400,000 for television advertisements during the British royal wedding in July), yet it can be expected to buy only a few years of time for the cartel. By the mid-1980s, the avalanche of Australian diamonds will be pouring onto the market. Unless the resourceful managers of De Beers can find a way to gain control of the various sources of diamonds that will soon crowd the market, these sources may bring about the final collapse of world diamond prices. If they do, the diamond invention will disintegrate and be remembered only as a historical curiosity, as brilliant in its way as the glittering little stones it once made so valuable.

COPPER CARTELS

CIPEC - Conseil Intergouvernemental des Pays Exportateurs de Cuivre

Composition

It was initially constituted with four members:

- Chile
- Peru
- Zaire
- Zambia

A further four were added to the cartel in 1975

- Australia
- Indonesia
- Papua New Guinea
- Yugoslavia

CIPEC represented around 30% of the world's refined copper, and more than 50% of the proven reserves of copper. The intent of the members to get higher prices ***failed,*** particularly of increasing the price during the crisis of 1975-1976, and the subsequent change of behavior of Chile finally finished the cartel.

Many experts consider that the market power of this cartel was negligible, because the residual demand that they faced was elastic (much higher than OPEC, for example). The inability of coordinating output cutbacks during the extensive period of life of CIPEC seems to validate this hypothesis. ***It was dissolved in 1988***.

CIPEC stages

There are three stages of the CIPEC that economist recognizes:

- Nationalization stage (1967-1973)
- Unilateral Action stage (1973-1976)
- Reflux stage (1976-1988)

Environmental conditions for CIPEC

The OPEC embargo marked a turning point in the history of the international copper trade, waking up the countries that depended strongly on their exports of commodities. They desired to imitate the behavior of CIPEC with the objective of increasing the prices of their commodities.

Motivated by Rio Tinto Zinc (RTZ), in November of 1974 in Lusaka the members of CIPEC reached an agreement to reduce copper exports by 10% -- later on increased to 15% -- until the first half of 1976. The high incentives took to that the countries did not complete the agreement completely and in fact in this period only 300,000 tons of copper were reduced by the cartel -- hardly half of the reductions contemplated in the agreement. High inventories and the growth of sources outside of the cartel prevented the policies adopted by CIPEC to benefit its members.

Snap Shot at Copper cartels

Since 1870, there have been several formal attempts to restrict the copper output and raise in this form its price.

This is a list of copper cartels in the 20th century:

- Copper Export Association, CEA, 1918-1923
- Copper Exporters, Inc., CEI, 1926-1932
- International Copper Cartel , ICC, 1935-1939 (Also called World Copper Agreement)
- Intergovernmental Council of Copper Exporting Countries, CIPEC, 1967-1988

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BAUXITE FILE

Australian Treaty Series 1975 No 38

DEPARTMENT OF FOREIGN AFFAIRS

CANBERRA

Agreement establishing the International Bauxite Association [IBA]
(Conakry, 8 March 1974)
Entry into force for Australia and generally: 29 July 1975
AUSTRALIAN TREATY SERIES

1975 No. 38

Australian Government Publishing Service

Canberra

AGREEMENT ESTABLISHING THE INTERNATIONAL BAUXITE ASSOCIATION

THE CONTRACTING PARTIES,

CONSCIOUS of the importance of bauxite and its products to the world economy in general and to their own national economies in particular;

ANXIOUS to promote the orderly and rational management, including the mining, processing and marketing of the bauxite resources of producing countries;

MINDFUL of the need to involve their own nationals more directly in such management;

RECOGNISING the power and influence of multinational corporations in the exploitation and processing of bauxite and the marketing of its products;

CONVINCED that increased co-operation and concerted action on the part of bauxite producing countries will contribute to the maximization of economic and social benefits accruing to their peoples from the exploitation of their bauxite resources;

CONSCIOUS further of the need to safeguard their permanent sovereignty over their natural resources;

HAVE AGREED as follows:

Article I

Establishment

The International Bauxite Association (hereinafter referred to as "the Association") is hereby established.

Article II

Membership

1. Membership of the Association shall be open to:

(a) (i) Australia

(ii) Guinea

(iii) Guyana

(iv) Jamaica

(v) Sierra Leone

(vi) Surinam

(vii) Yugoslavia

(b) Any other bauxite producing country which in the opinion of the Council of Ministers is able and willing to exercise the rights and assume the obligations of membership arising under this Agreement.

2. Countries listed in paragraph 1(a) of this Article which sign this Agreement in accordance with Article XX and ratify or approve it in accordance with Article XXI shall become members of the Association.

Article III

Objectives

The objectives of the Association are:

(a) to promote the orderly and rational development of the bauxite industry;

(b) to secure for member countries fair and reasonable returns from the exploitation, processing and marketing of bauxite and its products for the economic and social development of their peoples, bearing in mind the recognised interests of consumers;

(c) generally to safeguard the interests of member countries in relation to the bauxite industry.

Article VI

Obligations of member countries

In furtherance of these objectives member countries shall:

(a) exchange information concerning all aspects of the exploitation, processing, marketing and use of bauxite and its derivatives;

(b) Endeavour to harmonise their decisions and policies relating to the exploration, mining, processing and marketing of bauxite, alumina and aluminium, bearing in mind the need to ensure that-

(i) member countries enjoy reasonable returns from their production;

(ii) the consumers of these commodities are adequately supplied at reasonable prices;

(c) take action aimed at securing maximum national ownership of and effective national control over the exploitation of this natural resource within their territories and to support as far as possible any such action on the part of member countries;

(d) Endeavour to ensure that operations or projected operations by multinational corporations in the bauxite industry of one member country shall not be used to damage the interests of other member countries;

(e) conduct jointly such research as may be deemed appropriate in their mutual interest;

(f) explore the possibilities of joint or group purchasing of materials and equipment and of providing common services to member countries in their mutual interest.

Article V

General undertaking as to implementation

Member countries shall take all appropriate measures to ensure that obligations arising out of this Agreement are carried out and to facilitate the achievement of the objectives of the Association.

THE MINING FIRM AND ITS CORPORATE STRATEGY

A firm has to pose and seek answers to a number of questions:

- What products will the firm offer for sell?
- Who will be the firm's customers?
- Why will they buy the firm's products?
- What should the concept of the firm's business be – now and in the future?
- What should the firm continue to do, and what should it abandon?
- How should the firm try to compete against its market rivals?
- How does the firm's economic mission mesh with market and competitive realities?

A firm's answers to these questions comprise what is meant by corporate strategy and constitute its directional signals and its master plan.

DECISION-MAKING THEORY OF A MINING FIRM

Decision-making theory of a mining firm may be subdivided into three components:

- Profit
- Survival

- Growth

Profit: ► Basic objective of the firm and thus, is an important determinant of investment decisions.

Survival: ► Is the most critical decision-making component for most mining firms because of the problems associated with mine replacement. The mining firm cannot survive within the context of its currently producing mines. To survive it must successfully participate in the uncertain exploration environment.

Growth: ► A mining firm has three growth direction alternatives:

First stage: Horizontal integration

If a firm is to survive and grow, it must be successful in discovering other deposits. Success results in a horizontally integrated mining firm.

Second stage: Forward vertical integration

As a firm grows, three changes usually occur: exploration uncertainty decreases, market uncertainty increases and output of individual mineral products increases. These changes encourage forward vertical integration.

Vertical integration may only be effected gradually, in a number of stages over a period of time. The production of individual mineral commodities must be sufficient to support forward processing functions. Time is required within the firm the necessary marketing skills and processing technology. Financial resources are required to develop the forward processing plant. Realization of these basic requirements renders forward vertical integration feasible.

In spite of increasing incentives for vertical integration, the mining firm is not likely to abandon its horizontal integration strategy. The depletion of existing mines will provide a continuing need for the discovery of new deposits.

However, at some stage of growth, the mining firm will begin to develop forward processing facilities. The firm becomes its own customer between the integrated functions. Vertical integration transfers the market problem in the direction of the manufactured product. In pursuing such a strategy, the firm develops market skills and a technological base. Integration continues until a limit of profitable forward growth has been reached. A fully integrated mining firm embraces:

Mining ► Milling ► Smelting ► Refining ► Fabrication

Third stage: Diversification

As the mining firm's direction of growth shifts forward, the market skills and q technological base become increasingly important. These are the requisite characteristics for diversification. Whether such a strategy will be pursued depends on a number of factors. Diversification will be encouraged when:

- ► growth rates and profit expectations in other sectors are greater than within the mineral industry.
- ► market uncertainties for mineral products are high and it is desirable to spread the market uncertainty of the firm as a whole.
- ► Sufficient opportunities are not available within the mineral industry to sufficiently utilize the firm's resources.

PRODUCTION FUNCTIONS

Production: Any activity that creates value is production. It is a series of activities by which resource inputs (raw materials, labour, capital, land utilisation and managerial talents) are transformed over time into outputs of goods or services.

Production function:

$$Q = f(X_a, X_b, \text{----------} X_n)$$

Q = Quantity of output obtainable per period of time.
X_a, X_b, ----------X_n = Quantities of various types of inputs

Fixed and variable inputs

Fixed input – cannot be readily changed in short-run in response to desire to alter a firm's rate of output (e.g. major pieces of equipment and machinery, space available for productive activity (buildings, plant size) and key managerial personnel.

Variable input – Usage rate can be altered easily in desire to lower or increase volume of output (e.g. electric power, most raw materials, labour).

Short-run – Time period so short that the firm is constrained from varying the quantity of its fixed inputs.

Long-run – Time period sufficiently long to allow all inputs to be varied – no inputs are fixed including technology.

Short-run production function:

$$Q = f(X_a, X_b / X_c \text{ -------} X_n)$$

Variable fixed inputs

Cost functions – in short-run

- **Variable costs:** Costs vary with level of production (e.g. labour, materials).
- **Fixed costs:** (Also referred to as overhead costs) remain relatively constant regardless of the level of production activity. They tend to be proportional to time and independent of the number of units produced (e.g. rent, licence fees, R&D, insurance).

$$TC = TFC + TVC$$

Where, TC = Total cost

TFC = Total fixed cost

TVC = Total variable cost

$$TFC = \sum_{i=1}^{n} p_i \cdot x_i$$

Where, p_i = price of a specified fixed input

x_i = quantity of the specified fixed input

n = number of various fixed inputs

$$TVC = \sum_{j=1}^{n} p_j \cdot x_j$$

Where, p_j = price of a specified variable input

x_j = quantity of the specified variable input

n = number of various variable inputs

Thus:

$$TC = \sum_{i=1}^{n} p_i \cdot x_i + \sum_{j=1}^{n} p_j \cdot x_j$$

Definitions:

- **Totals:** Total (costs, revenues, profits) as a function of output.
- **Averages:** (costs, revenues, profits) at a given output level.
- **Marginals:** Amount of (cost, revenue, profit) added to the total amount by each additional unit of output, at a given level of output.

Equations:

Totals	**Averages**	**Marginals**
TC = f(Q)	AC = TC/Q	MC = dTC/dQ
TR = f(Q)	AR = TR/Q	MR = dTR/dQ
TP = TR – TC	AP = TP/Q	MP= dTP/dQ

Where, Q = output

Break-even occurs when TR = TC