

Production Functions

In microeconomics and macroeconomics, a production function is a function that specifies the output of a firm, an industry, or an entire economy for all combinations of inputs. This function is an assumed technological relationship, based on the current state of engineering knowledge; it does not represent the result of economic choices, but rather is an externally given entity that influences economic decision-making. Almost all economic theories presuppose a production function, either on the firm level or the aggregate level. In this sense, the production function is one of the key concepts of mainstream neoclassical theories. Some non-mainstream economists, however, reject the very concept of an aggregate production function.

Concept of production functions

In micro-economics, a production function is a function that specifies the output of a firm for all combinations of inputs. A meta-production function (sometimes meta production function) compares the practice of the existing entities converting inputs into output to determine the most efficient practice production function of the existing entities, whether the most efficient feasible practice production or the most efficient actual practice production. Clarification needed in either case, the maximum output of a technologically-determined production process is a mathematical function of one or more inputs. Put another way, given the set of all technically feasible combinations of output and inputs, only the combinations encompassing a maximum output for a specified set of inputs would constitute the production function. Alternatively, a production function can be defined as the specification of the minimum input requirements needed to produce designated quantities of output, given available technology. It is usually presumed that unique production functions can be constructed for every production technology.

By assuming that the maximum output technologically possible from a given set of inputs is achieved, economists using a production function in analysis are abstracting from the engineering and managerial problems inherently associated with a particular production process. The engineering and managerial problems of technical efficiency are assumed to be solved, so that analysis can focus on the problems of allocative efficiency. The firm is assumed to be making allocative choices concerning how much of each input factor to use and how much output to produce, given the cost (purchase price) of each factor, the selling price of the output, and the technological determinants represented by the production function. A decision frame in which one or more inputs are held constant may be used; for example, (physical) capital may be assumed to be fixed (constant) in the short run, and labour and possibly other inputs such as raw materials variable, while in the long run, the quantities of both capital and the other factors that may be chosen by the firm are variable. In the long run, the firm may even have a choice of technologies, represented by various possible production functions.

The relationship of output to inputs is non-monetary; that is, a production function relates physical inputs to physical outputs, and prices and costs are not reflected in the function. But the production function is not a full model of the production process: it deliberately abstracts from inherent aspects of physical production processes that some would argue are

essential, including error, entropy or waste. Moreover, production functions do not ordinarily model the business processes, either, ignoring the role of management. (For a primer on the fundamental elements of microeconomic production theory, see production theory basics).

The primary purpose of the production function is to address allocative efficiency in the use of factor inputs in production and the resulting distribution of income to those factors. Under certain assumptions, the production function can be used to derive a marginal product for each factor, which implies an ideal division of the income generated from output into an income due to each input factor of production.

Specifying the production function

A production function can be expressed in functional form as the right side of

$$Q = f(X_1, X_2, X_3, \dots, X_n)$$

where:

Q = quantity of output

$X_1, X_2, X_3, \dots, X_n$ = quantities of factor inputs (such as capital, labour, land or raw materials).

If Q is a scalar, then this form does not encompass joint production, which is a production process that has multiple co-products. On the other hand, if f maps from R^n to R^k then it is a joint production function expressing the determination of k different types of output based on the joint usage of the specified quantities of the n inputs.

One formulation, unlikely to be relevant in practice, is as a linear function:

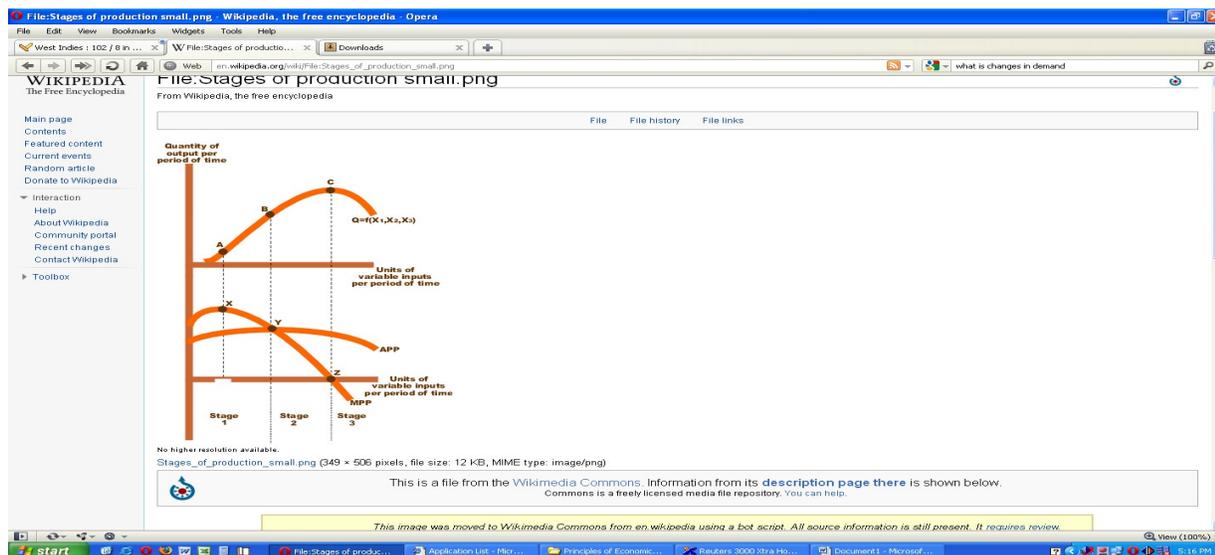
$$Q = a + bX_1 + cX_2 + dX_3 + \dots$$

Where a, b, c, and d are parameters that are determined empirically.

Another is as a Cobb-Douglas production function:

The Leontief production function applies to situations in which inputs must be used in fixed proportions; starting from those proportions, if usage of one input is increased without another being increased, output will not change. This production function is given by

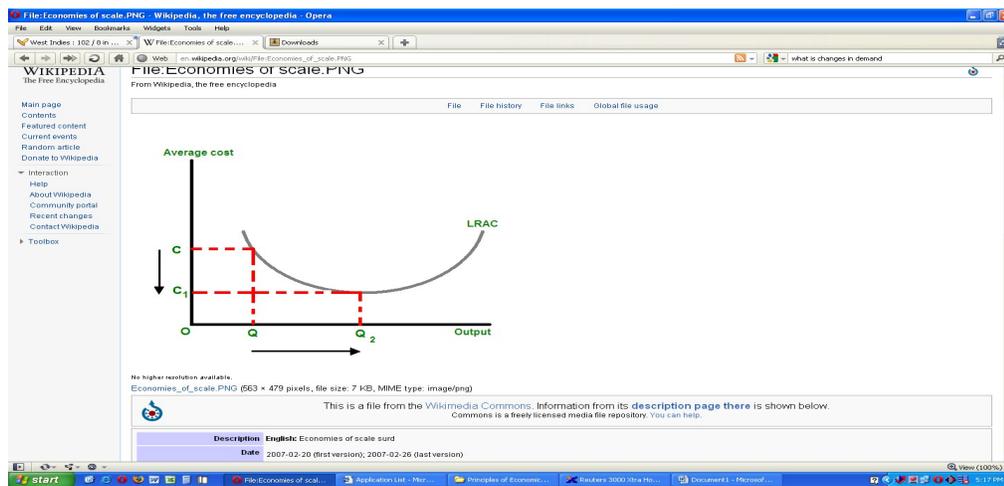
Other forms include the constant elasticity of substitution production function (CES), which is a generalized form of the Cobb-Douglas function, and the quadratic production function. The best form of the equation to use and the values of the parameters (a, b, c,...) vary from company to company and industry to industry. In a short run production function at least one of the X's (inputs) is fixed. In the long run all factor inputs are variable at the discretion of management.



Economies of scale

Economies of scale, in microeconomics, refers to the cost advantages that a business obtains due to expansion. There are factors that cause a producer's average cost per unit to fall as the scale of output is increased. "Economies of scale" is a long run concept and refers to reductions in unit cost as the size of a facility and the usage levels of other inputs increase.[1] Diseconomies of scale are the opposite. The common sources of economies of scale are purchasing (bulk buying of materials through long-term contracts), managerial (increasing the specialization of managers), financial (obtaining lower-interest charges when borrowing from banks and having access to a greater range of financial instruments), marketing (spreading the cost of advertising over a greater range of output in media markets), and technological (taking advantage of returns to scale in the production function). Each of these factors reduces the long run average costs (LRAC) of production by shifting the short-run average total cost (SRATC) curve down and to the right. Economies of scale are also derived partially from learning by doing.

Economies of scale is a practical concept that is important for explaining real world phenomena such as patterns of international trade, the number of firms in a market, and how firms get "too big to fail". The exploitation of economies of scale helps explain why companies grow large in some industries. It is also a justification for free trade policies, since some economies of scale may require a larger market than is possible within a particular country — for example, it would not be efficient for Liechtenstein to have its own car maker, if they would only sell to their local market. A lone car maker may be profitable, however, if they export cars to global markets in addition to selling to the local market. Economies of scale also play a role in a "natural monopoly."



Income Elasticity of Demand

The Income Elasticity of Demand measures the rate of response of quantity demanded due to a raise (or lowering) in a consumer's income. The formula for the Income Elasticity of Demand (IEoD) is given by:

$$\text{IEoD} = (\% \text{ Change in Quantity Demanded}) / (\% \text{ Change in Income})$$

Calculating the Income Elasticity of Demand

On an assignment or a test, you might be asked "Given the following data, calculate the income elasticity of demand when a consumer's income changes from \$40,000 to \$50,000". (Your course may use the more complicated Arc Income Elasticity of Demand formula. If so you'll need to see the article on Arc Elasticity) Using the chart on the bottom of the page, I'll walk you through answering this question.

The first thing we'll do is find the data we need. We know that the original income is \$40,000 and the new price is \$50,000 so we have Income (OLD) = \$40,000 and Income (NEW) = \$50,000. From the chart we see that the quantity demanded when income is \$40,000 is 150 and when the price is \$50,000 is 180. Since we're going from \$40,000 to \$50,000 we have QDemand(OLD) = 150 and QDemand(NEW) = 180, where "QDemand" is short for "Quantity Demanded". So you should have these four figures written down:

$$\text{Income (OLD)} = 40,000$$

$$\text{Income (NEW)} = 50,000$$

$$\text{QDemand (OLD)} = 150$$

$$\text{QDemand (NEW)} = 180$$

To calculate the price elasticity, we need to know what the percentage change in quantity demand is and what the percentage change in price is. It's best to calculate these one at a time.

Calculating the Percentage Change in Quantity Demanded

The formula used to calculate the percentage change in quantity demanded is:

$$[Q_{\text{Demand}}(\text{NEW}) - Q_{\text{Demand}}(\text{OLD})] / Q_{\text{Demand}}(\text{OLD})$$

By filling in the values we wrote down, we get:

$$[180 - 150] / 150 = (30/150) = 0.2$$

So we note that % Change in Quantity demanded = 0.2 (We leave this in decimal terms. In percentage terms this would be 20%) and we save this figure for later. Now we need to calculate the percentage change in price.

Calculating the Percentage Change in Income

Similar to before, the formula used to calculate the percentage change in income is:

$$[\text{Income}(\text{NEW}) - \text{Income}(\text{OLD})] / \text{Income}(\text{OLD})$$

By filling in the values we wrote down, we get:

$$[50,000 - 40,000] / 40,000 = (10,000/40,000) = 0.25$$

We have both the percentage change in quantity demand and the percentage change in income, so we can calculate the income elasticity of demand.

Final Step of Calculating the Income Elasticity of Demand

We go back to our formula of:

$$\text{IEoD} = (\% \text{ Change in Quantity Demanded}) / (\% \text{ Change in Income})$$

We can now fill in the two percentages in this equation using the figures we calculated earlier.

$$\text{IEoD} = (0.20) / (0.25) = 0.8$$

Unlike price elasticity, we do care about negative values, so do not drop the negative sign if you get one. Here we have a positive price elasticity, and we conclude that the income elasticity of demand when income increases from \$40,000 to \$50,000 is 0.8.

How Do We Interpret the Income Elasticity of Demand?

Income elasticity of demand is used to see how sensitive the demand for a good is to an income change. The higher the income elasticity, the more sensitive demand for a good is to income changes. A very high income elasticity suggests that when a consumer's income goes up, consumers will buy a great deal more of that good. A very low price elasticity implies just the opposite, that changes in a consumer's income has little influence on demand.

Often an assignment or a test will ask you the follow up question "Is the good a luxury good, a normal good, or an inferior good between the income range of \$40,000 and \$50,000?" To answer that use the following rule of thumb:

If $IEoD > 1$ then the good is a Luxury Good and Income Elastic

If $IEoD < 1$ and $IEoD > 0$ then the good is a Normal Good and Income Inelastic

If $IEoD < 0$ then the good is an Inferior Good and Negative Income Inelastic

In our case, we calculated the income elasticity of demand to be 0.8 so our good is income inelastic and a normal good and thus demand is not very sensitive to income changes.

Price discrimination

Price discrimination or price differentiation [1] exists when sales of identical goods or services are transacted at different prices from the same provider. [2] In a theoretical market with perfect information, perfect substitutes, and no transaction costs or prohibition on secondary exchange (or re-selling) to prevent arbitrage, price discrimination can only be a feature of monopolistic and oligopolistic markets [3], where market power can be exercised. Otherwise, the moment the seller tries to sell the same good at different prices, the buyer at the lower price can arbitrage by selling to the consumer buying at the higher price but with a tiny discount. However, product heterogeneity, market frictions or high fixed costs (which make marginal-cost pricing unsustainable in the long run) can allow for some degree of differential pricing to different consumers, even in fully competitive retail or industrial markets. Price discrimination also occurs when the same price is charged to customers which have different supply costs.

The effects of price discrimination on social efficiency are unclear; typically such behavior leads to lower prices for some consumers and higher prices for others. Output can be expanded when price discrimination is very efficient, but output can also decline when discrimination is more effective at extracting surplus from high-valued users than expanding sales to low valued users. Even if output remains constant, price discrimination can reduce efficiency by misallocating output among consumers.

Price discrimination requires market segmentation and some means to discourage discount customers from becoming resellers and, by extension, competitors. This usually entails using one or more means of preventing any resale, keeping the different price groups separate, making price comparisons difficult, or restricting pricing information. The boundary set up by the marketer to keep segments separate are referred to as a rate fence. Price discrimination is thus very common in services, where resale is not possible; an example is student discounts at museums. Price discrimination in intellectual property is also enforced by law and by technology. In the market for DVDs, DVD players are designed - by law - with chips to prevent use of an inexpensive copy of the DVD (for example legally purchased in India) from being used in a higher price market (like the US). The Digital Millennium Copyright Act has provisions to outlaw circumventing of such devices to protect the enhanced monopoly profits that copyright holders can obtain from price discrimination against higher price market segments.

Price discrimination can also be seen where the requirement that goods be identical is relaxed. For example, so-called "premium products" (including relatively simple products, such as cappuccino compared to regular coffee) have a price differential that is not

explained by the cost of production. Some economists have argued that this is a form of price discrimination exercised by providing a means for consumers to reveal their willingness to pay.

Types of price discrimination

First degree price discrimination

In first degree price discrimination, price varies by customer's willingness or ability to pay. This arises from the fact that the value of goods is subjective. A customer with low price elasticity is less deterred by a higher price than a customer with high price elasticity of demand. As long as the price elasticity (in absolute value) for a customer is less than one, it is very advantageous to increase the price: the seller gets more money for fewer goods. With an increase of the price elasticity tends to rise above one. One can show that in the optimum the price, as it varies by customer, is inversely proportional to one minus the reciprocal of the price elasticity of that customer at that price. This assumes that the consumer passively reacts to the price set by the seller, and that the seller knows the demand curve of the customer. In practice however there is a bargaining situation, which is more complex: the customer may try to influence the price, such as by pretending to like the product less than he or she really does or by threatening not to buy it.

An alternative way to understand First Degree Price Discrimination is as follows: This type of price discrimination is primarily theoretical because it requires the seller of a good or service to know the absolute maximum price that every consumer is willing to pay. As above, it is true that consumers have different price elasticity, but the seller is not concerned with such. The seller is concerned with the maximum willingness to pay (or reservation price) of each customer. By knowing the reservation price, the seller is able to absorb the entire market surplus, thus taking all of the consumer's surplus from the consumer and transforming it into revenues. From a social welfare perspective though, first degree price discrimination is not necessarily undesirable. That is, the market is still entirely efficient and there is no deadweight loss to society. In a market with first degree price discrimination, the seller(s) simply captures all surplus. Efficiency is unchanged but the wealth is transferred. This type of market does not exist much in reality, hence it is primarily theoretical. Examples of where this might be observed are in markets where consumers bid for tenders, though still, in this case, the practice of collusive tendering undermines efficiency.

Second degree price discrimination

In second degree price discrimination, price varies according to quantity sold. Larger quantities are available at a lower unit price. This is particularly widespread in sales to industrial customers, where bulk buyers enjoy higher discounts.

Additionally to second degree price discrimination, sellers are not able to differentiate between different types of consumers. Thus, the suppliers will provide incentives for the consumers to differentiate themselves according to preference. As above, quantity

"discounts", or non-linear pricing, is a means by which suppliers use consumer preference to distinguish classes of consumers. This allows the supplier to set different prices to the different groups and capture a larger portion of the total market surplus.

In reality, different pricing may apply to differences in product quality as well as quantity. For example, airlines often offer multiple classes of seats on flights, such as first class and economy class. This is a way to differentiate consumers based on preference, and therefore allows the airline to capture more consumer's surplus.

Third degree price discrimination

In third degree price discrimination, price varies by attributes such as location or by customer segment, or in the most extreme case, by the individual customer's identity; where the attribute in question is used as a proxy for ability/willingness to pay.

Additionally to third degree price discrimination, the supplier(s) of a market where this type of discrimination is exhibited are capable of differentiating between consumer classes. Examples of this differentiation are student or senior discounts. For example, a student or a senior consumer will have a different willingness to pay than an average consumer, where the reservation price is presumably lower because of budget constraints. Thus, the supplier sets a lower price for that consumer because the student or senior has a more elastic price elasticity of demand (see the discussion of price elasticity of demand as it applies to revenues from the first degree price discrimination, above). The supplier is once again capable of capturing more market surplus than would be possible without price discrimination.

Note that it is not always advantageous to the company to price discriminate even if it is possible, especially for second and third degree discrimination. In some circumstances, the demands of different classes of consumers will encourage suppliers to ignore one or more classes and target entirely to the rest. Whether it is profitable to price discriminate is determined by the specifics of a particular market.

Index numbers

An index number is an economic data figure reflecting price or quantity compared with a standard or base value. [4][5] The base usually equals 100 and the index number is usually expressed as 100 times the ratio to the base value. For example, if a commodity costs twice as much in 1970 as it did in 1960, its index number would be 200 relative to 1960. Index numbers are used especially to compare business activity, the cost of living, and employment. They enable economists to reduce unwieldy business data into easily understood terms.

In economics, index numbers generally are time series summarizing movements in a group of related variables. In some cases, however, index numbers may compare geographic areas

at a point in time. An example is a country's purchasing power parity. The best-known index number is the consumer price index, which measures changes in retail prices paid by consumers. In addition, a cost-of-living index (COLI) is a price index number that measures relative cost of living over time. [6] In contrast to a COLI based on the true but unknown utility function, a superlative index number is an index number that can be calculated.[6] Thus, superlative index numbers are used to provide a fairly close approximation to the underlying cost-of-living index number in a wide range of circumstances.[6]

There is a substantial body of economic analysis concerning the construction of index numbers, desirable properties of index numbers and the relationship between index numbers and economic theory

Economic Rate of Return

The economic rate of return, also known as "return on investment" (ROI), is a measurement of the ability of an asset to appreciate in value. Professional investors traditionally use ROI to gauge the efficiency with which a company generates revenue from its assets. By calculating the ROI, it is possible to identify investments that will be attractive in the future because of their ability to produce gains. A negative ROI can also help you identify unprofitable and inefficient institutions.

Determine the cost of investment. If you wish to find the cost of a specific investment a public company has made, it can always be found in the annual report, or 10-K. The 10-K can be found on a public company's website under the "Investors" or "Investor Relations" section. Specific investment costs along with total investment costs will be listed on the income statement.

2

Determine the current value of the investment. If the company has already sold the investment, the gain will be listed on the income statement. If the company has not sold the investment, gains will be noted as "unrealized." Unrealized gains are gains that would be received if the investment were sold now. When the investment is sold, the gains are "realized."

3

Calculate the rate of return. The calculation for ROI is as follows:

$$[(\text{Current Value of Investment} - \text{Cost of Investment}) / (\text{Cost of Investment})] \times 100$$

For example, if an investment cost \$5,000,000 and is currently worth \$6,000,000, the calculation would be:

$$[(\$6,000,000 - \$5,000,000 / (\$5,000,000))] \times 100 = 20 \text{ percent}$$

Transfer Pricing

Transfer pricing refers to the setting, analysis, documentation, and adjustment of charges made between related parties for goods, services, or use of property (including intangible property). Transfer prices among components of an enterprise may be used to reflect allocation of resources among such components, or for other purposes. OECD Transfer Pricing Guidelines state, “Transfer prices are significant for both taxpayers and tax administrations because they determine in large part the income and expenses, and therefore taxable profits, of associated enterprises in different tax jurisdictions.”

Many governments have adopted transfer pricing rules that apply in determining or adjusting income taxes of domestic and multinational taxpayers. The OECD has adopted guidelines followed, in whole or in part, by many of its member countries in adopting rules. United States and Canadian rules are similar in many respects to OECD guidelines, with certain points of material difference. A few countries follow rules that are materially different overall.

The rules of nearly all countries permit related parties to set prices in any manner, but permit the tax authorities to adjust those prices where the prices charged are outside an arm's length range. Rules are generally provided for determining what constitutes such arm's length prices, and how any analysis should proceed. Prices actually charged are compared to prices or measures of profitability for unrelated transactions and parties. The rules generally require that market level, functions, risks, and terms of sale of unrelated party transactions or activities be reasonably comparable to such items with respect to the related party transactions or profitability being tested.

Most systems allow use of multiple methods, where appropriate and supported by reliable data, to test related party prices. Among the commonly used methods are comparable uncontrolled prices, cost plus, resale price or markup, and profitability based methods. Many systems differentiate methods of testing goods from those for services or use of property due to inherent differences in business aspects of such broad types of transactions. Some systems provide mechanisms for sharing or allocation of costs of acquiring assets (including intangible assets) among related parties in a manner designed to reduce tax controversy.

Most tax treaties and many tax systems provide mechanisms for resolving disputes among taxpayers and governments in a manner designed to reduce the potential for double taxation. Many systems also permit advance agreement between taxpayers and one or more governments regarding mechanisms for setting related party prices.

Many systems impose penalties where the tax authority has adjusted related party prices. Some tax systems provide that taxpayers may avoid such penalties by preparing documentation in advance regarding prices charged between the taxpayer and related parties. Some systems require that such documentation be prepared in advance in all cases.

Economic theory

The discussion in this section explains an economic theory behind optimal transfer pricing with optimal defined as transfer pricing that maximizes overall firm profits in a non-

realistic world with no taxes, no capital risk, no development risk, no externalities or any other frictions which exist in the real world. In practice a great many factors influence the transfer prices that are used by multinational corporations, including performance measurement, capabilities of accounting systems, import quotas, customs duties, VAT, taxes on profits, and (in many cases) simple lack of attention to the pricing.

From marginal price determination theory, the optimum level of output is that where marginal cost equals marginal revenue. That is to say, a firm should expand its output as long as the marginal revenue from additional sales is greater than their marginal costs. In the diagram that follows, this intersection is represented by point A, which will yield a price of P^* , given the demand at point B.

When a firm is selling some of its product to itself, and only to itself (i.e. there is no external market for that particular transfer good), then the picture gets more complicated, but the outcome remains the same. The demand curve remains the same. The optimum price and quantity remain the same. But marginal cost of production can be separated from the firm's total marginal costs. Likewise, the marginal revenue associated with the production division can be separated from the marginal revenue for the total firm. This is referred to as the Net Marginal Revenue in production (NMR) and is calculated as the marginal revenue from the firm minus the marginal costs of distribution.

It can be shown algebraically that the intersection of the firm's marginal cost curve and marginal revenue curve (point A) must occur at the same quantity as the intersection of the production division's marginal cost curve with the net marginal revenue from production (point C).

If the production division is able to sell the transfer good in a competitive market (as well as internally), then again both must operate where their marginal costs equal their marginal revenue, for profit maximization. Because the external market is competitive, the firm is a price taker and must accept the transfer price determined by market forces (their marginal revenue from transfer and demand for transfer products becomes the transfer price). If the market price is relatively high (as in P_{tr1} in the next diagram), then the firm will experience an internal surplus (excess internal supply) equal to the amount Q_{t1} minus Q_{f1} . The actual marginal cost curve is defined by points A, C, D.

Transfer Pricing with an Imperfect External Market

If the firm is able to sell its transfer goods in an imperfect market, then it need not be a price taker. There are two markets each with its own price (P_f and P_t in the next diagram). The aggregate market is constructed from the first two. That is, point C is a horizontal summation of points A and B (and likewise for all other points on the Net Marginal Revenue curve (NMRa)). The total optimum quantity (Q) is the sum of Q_f plus Q_t .

Giffen good

In economics and consumer theory, a Giffen good is one which people paradoxically consume more of as the price rises, violating the law of demand. In normal situations, as the price of a good rises, the substitution effect causes consumers to purchase less of it and more of substitute goods. In the Giffen good situation the income effect dominates, leading people to buy more of the good, even as its price rises.

Evidence for the existence of Giffen goods is limited, but microeconomic mathematical models explain how such a thing could exist. Giffen goods are named after Scottish economist Sir Robert Giffen, who was attributed as the author of this idea by Alfred Marshall in his book *Principles of Economics*. Giffen first proposed the paradox from his observations of the purchasing habits of the Victorian era poor.

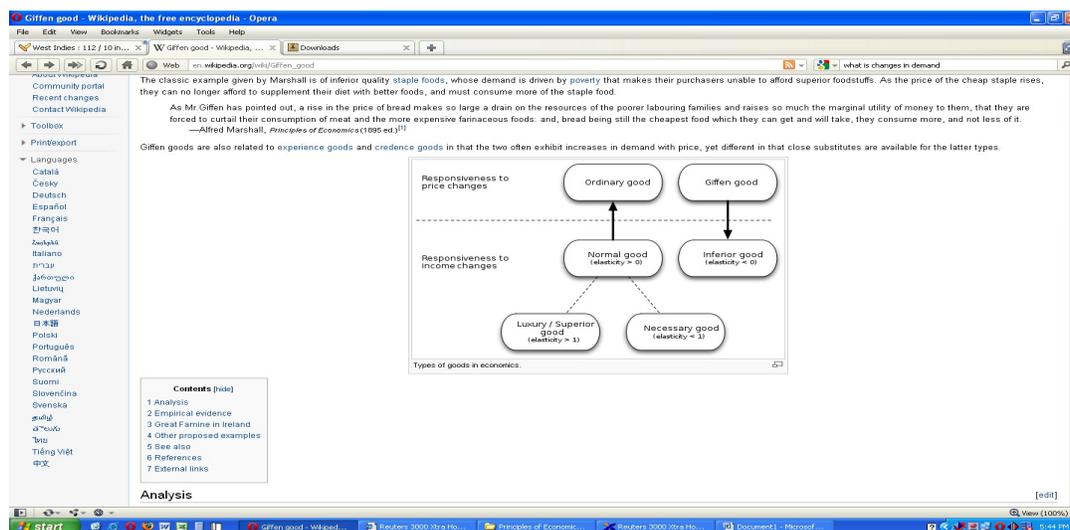
For most products, price elasticity of demand is negative (note that, although they are negative, price elasticities of demand are often reported as positive numbers; see the mathematical definition for more). In other words, price and quantity demanded pull in opposite directions; if price goes up, then quantity demanded goes down, or vice versa. Giffen goods are an exception to this. Their price elasticity of demand is positive. When price goes up, the quantity demanded also goes up, and vice versa. In order to be a true Giffen good, price must be the only thing that changes to get a change in quantity demand, and a Giffen good should not be confused with products bought as status symbols or for conspicuous consumption (such a situation would indicate a Veblen goods).

The classic example given by Marshall is of inferior quality staple foods, whose demand is driven by poverty that makes their purchasers unable to afford superior foodstuffs. As the price of the cheap staple rises, they can no longer afford to supplement their diet with better foods, and must consume more of the staple food.

As Mr. Giffen has pointed out, a rise in the price of bread makes so large a drain on the resources of the poorer labouring families and raises so much the marginal utility of money to them, that they are forced to curtail their consumption of meat and the more expensive farinaceous foods: and, bread being still the cheapest food which they can get and will take, they consume more, and not less of it.

—Alfred Marshall, *Principles of Economics* (1895 ed.)[1]

Giffen goods are also related to experience goods and credence goods in that the two often exhibit increases in demand with price, yet different in that close substitutes are available for the latter types.



Analysis

There are three necessary preconditions for this situation to arise:

- The good in question must be an inferior good,
- There must be a lack of close substitute goods, and
- The good must constitute a substantial percentage of the buyer's income, but not such a substantial percentage of the buyer's income that none of the associated normal goods are consumed.

If precondition #1 is changed to "The good in question must be so inferior that the income effect is greater to the substitution effect" then this list defines necessary and sufficient conditions. As the last condition is a condition on the buyer rather than the good itself, the phenomenon can also be labeled as "Giffen behavior".

This can be illustrated with a diagram. Initially the consumer has the choice between spending their income on either commodity Y or commodity X as defined by line segment MN (where M = total available income divided by the price of commodity Y, and N = total available income divided by the price of commodity X). The line MN is known as the consumer's budget constraint. Given the consumer's preferences, as expressed in the indifference curve IO, the optimum mix of purchases for this individual is point A.

If there is a drop in the price of commodity X, there will be two effects. The reduced price will alter relative prices in favour of commodity X, known as the substitution effect. This is illustrated by a movement down the indifference curve from point A to point B (a pivot of the budget constraint about the original indifference curve). At the same time, the price reduction causes the consumers' purchasing power to increase, known as the income effect (an outward shift of the budget constraint). This is illustrated by the shifting out of the dotted line to MP (where P = income divided by the new price of commodity X). The substitution effect (point A to point B) raises the quantity demanded of commodity X from X_a to X_b while the income effect lowers the quantity demanded from X_b to X_c . The net effect is a reduction in quantity demanded from X_a to X_c making commodity X a Giffen

goods by definition. Any good where the income effect more than compensates for the substitution effect is a Giffen good.

Millennium Development Goals

The Millennium Development Goals (MDGs) are eight international development goals that all 192 United Nations member states and at least 23 international organizations have agreed to achieve by the year 2015. They include eradicating extreme poverty, reducing child mortality rates, fighting disease epidemics such as AIDS, and developing a global partnership for development. [1]

Background

The aim of the Millennium Development Goals (MDGs) is to encourage development by improving social and economic conditions in the world's poorest countries. They derive from earlier international development targets, [2] and were officially established following the Millennium Summit in 2000, where all world leaders present adopted the United Nations Millennium Declaration, from which the eight goals were derived by a group headed by Jeffrey Sachs.

The Millennium Summit was presented with the report of the Secretary-General entitled 'We the Peoples: The Role of the United Nations in the Twenty-First Century'. Additional input was prepared by the Millennium Forum, which brought together representatives of over 1,000 non-governmental and civil society organizations from more than 100 countries. The Forum met in May 2000 to conclude a two-year consultation process covering issues such as poverty eradication, environmental protection, human rights and protection of the vulnerable. The approval of the MDGs was possibly the main outcome of the Millennium Summit. In the area of peace and security, the adoption of the Brahimi Report was seen as properly equipping the organization to carry out the mandates given by the Security Council.[citation needed]

Ideas behind the MDG

The Millennium Development Goals (MDGs) originated from the Millennium Declaration produced by the United Nations. The Declaration asserts that every individual has the right to dignity, freedom, equality, a basic standard of living that includes freedom from hunger and violence, and encourages tolerance and solidarity. [3] The MDGs were made to operationalize these ideas by setting targets and indicators for poverty reduction in order to achieve the rights set forth in the Declaration on a set fifteen-year timeline.[3][4]

The MDGs focus on three major areas of Human development (humanity): bolstering human capital, improving infrastructure, and increasing social, economic and political rights, with the majority of the focus going towards increasing basic standards of living.[5] The objectives chosen within the human capital focus include improving nutrition, healthcare (including reducing levels of child mortality, HIV/AIDS, tuberculosis and

malaria, and increasing reproductive health), and education. For the infrastructure focus, the objectives include improving infrastructure through increasing access to safe drinking water, energy and modern information/communication technology; amplifying farm outputs through sustainable practices; improving transportation infrastructure; and preserving the environment. Lastly, for the social, economic and political rights focus, the objectives include empowering women, reducing violence, increasing political voice, ensuring equal access to public services, and increasing security of property rights. The goals chosen were intended to increase an individual's human capabilities and "advance the means to a productive life".[5] The MDGs emphasize that individual policies needed to achieve these goals should be tailored to individual country's needs; therefore most policy suggestions are general.[5]

The MDGs also emphasize the role of developed countries in aiding developing countries, as outlined in Goal Eight. Goal Eight sets objectives and targets for developed countries to achieve a "global partnership for development" by supporting fair trade, debt relief for developing nations, increasing aid and access to affordable essential medicines, and encouraging technology transfer.[5][6] Thus developing nations are not seen as left to achieve the MDGs on their own, but as a partner in the developing-developed compact to reduce world poverty.

Millennium Development Goals (MDGs)

The MDG were developed out of the eight chapters of the United Nations, signed in September 2000. There are eight goals with 21 targets,[7] and a series of measurable indicators for each target.[8][9]

Goal 1: Eradicate extreme poverty and hunger

Target 1A: Halve the proportion of people living on less than \$1 a day

Proportion of population below \$1 per day (PPP values)

Poverty gap ratio [incidence x depth of poverty]

Share of poorest quintile in national consumption

Target 1B: Achieve Decent Employment for Women, Men, and Young People

GDP Growth per Employed Person

Employment Rate

Proportion of employed population below \$1 per day (PPP values)

Proportion of family-based workers in employed population

Target 1C: Halve the proportion of people who suffer from hunger

Prevalence of underweight children under five years of age

Proportion of population below minimum level of dietary energy consumption[10]

Goal 2: Achieve universal primary education

Target 2A: By 2015, all children can complete a full course of primary schooling, girls and boys

Enrollment in primary education

Completion of primary education

Literacy of 15-24 year olds, female and male[11]

Goal 3: Promote gender equality and empower women

Target 3A: Eliminate gender disparity in primary and secondary education preferably by 2005, and at all levels by 2015

Ratios of girls to boys in primary, secondary and tertiary education

Share of women in wage employment in the non-agricultural sector

Proportion of seats held by women in national parliament[12]

Goal 4: Reduce child mortality rate

Target 4A: Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate

Under-five mortality rate

Infant (under 1) mortality rate

Proportion of 1-year-old children immunized against measles [13]

Goal 5: Improve maternal health

Target 5A: Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio

Maternal mortality ratio

Proportion of births attended by skilled health personnel

Target 5B: Achieve, by 2015, universal access to reproductive health

Contraceptive prevalence rate

Adolescent birth rate

Antenatal care coverage

Unmet need for family planning [14]

Goal 6: Combat HIV/AIDS, malaria, and other diseases

Target 6A: Have halted by 2015 and begun to reverse the spread of HIV/AIDS

HIV prevalence among population aged 15–24 years

Condom use at last high-risk sex

Proportion of population aged 15–24 years with comprehensive correct knowledge of HIV/AIDS

Target 6B: Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it

Proportion of population with advanced HIV infection with access to antiretroviral drugs

Target 6C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases

Prevalence and death rates associated with malaria

Proportion of children under 5 sleeping under insecticide-treated bed nets

Proportion of children under 5 with fever who are treated with appropriate anti-malarial drugs

Prevalence and death rates associated with tuberculosis

Proportion of tuberculosis cases detected and cured under DOTS (Directly Observed Treatment Short Course)[15]

Goal 7: Ensure environmental sustainability

Target 7A: Integrate the principles of sustainable development into country policies and programs; reverse loss of environmental resources

Target 7B: Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss

Proportion of land area covered by forest

CO₂ emissions, total, per capita and per \$1 GDP (PPP)

Consumption of ozone-depleting substances

Proportion of fish stocks within safe biological limits

Proportion of total water resources used

Proportion of terrestrial and marine areas protected

Proportion of species threatened with extinction

Target 7C: Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation (for more information see the entry on water supply)

Proportion of population with sustainable access to an improved water source, urban and rural

Proportion of urban population with access to improved sanitation

Target 7D: By 2020, to have achieved a significant improvement in the lives of at least 100 million slum-dwellers

Proportion of urban population living in slums[16]

Goal 8: Develop a global partnership for development

Target 8A: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system

Includes a commitment to good governance, development, and poverty reduction – both nationally and internationally

Target 8B: Address the Special Needs of the Least Developed Countries (LDC)

Includes: tariff and quota free access for LDC exports; enhanced programme of debt relief for HIPC and cancellation of official bilateral debt; and more generous ODA (Overseas Development Assistance) for countries committed to poverty reduction

Target 8C: Address the special needs of landlocked developing countries and Small Island developing States

Through the Programme of Action for the Sustainable Development of Small Island Developing States and the outcome of the twenty-second special session of the General Assembly

Target 8D: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term

Some of the indicators listed below are monitored separately for the least developed countries (LDCs), Africa, landlocked developing countries and small island developing States.

Official development assistance (ODA):

Net ODA, total and to LDCs, as percentage of OECD/DAC donors' GNI

Proportion of total sector-allocable ODA of OECD/DAC donors to basic social services (basic education, primary health care, nutrition, safe water and sanitation)

Proportion of bilateral ODA of OECD/DAC donors that is untied

ODA received in landlocked countries as proportion of their GNIs

ODA received in Small Island developing States as proportion of their GNIs

Market access:

Proportion of total developed country imports (by value and excluding arms) from developing countries and from LDCs, admitted free of duty

Average tariffs imposed by developed countries on agricultural products and textiles and clothing from developing countries

Agricultural support estimate for OECD countries as percentage of their GDP

Proportion of ODA provided to help build trade capacity

Debt sustainability:

Total number of countries that have reached their HIPC decision points and number that have reached their HIPC completion points (cumulative)

Debt relief committed under HIPC initiative, US\$

Debt service as a percentage of exports of goods and services

Target 8E: In co-operation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries

Proportion of population with access to affordable essential drugs on a sustainable basis

Target 8F: In co-operation with the private sector, make available the benefits of new technologies, especially information and communications

Telephone lines and cellular subscribers per 100 population

Personal computers in use per 100 population

Internet users per 100 Population [17]

Mass Production

Mass production (also called flow production, repetitive flow production, series production, or serial production) is the production of large amounts of standardized products, including and especially on assembly lines. The concepts of mass production are applied to various kinds of products, from fluids and particulates handled in bulk (such as food, fuel, chemicals, and mined minerals) to discrete solid parts (such as fasteners) to assemblies of such parts (such as household appliances and automobiles).

The term mass production was defined in a 1926 article in the Encyclopedia Britannica supplement that was written based on correspondence with Ford Motor Co. The New York Times used the term in the title of an article that appeared before publication of the Britannica article.[1] It was also referenced by Sir Chiozza Money, the Fabian banker, politician and author, writing in the London Observer in 1919, comparing the efficiency of Mass Production techniques as used in America, with British practice.

Mass production of assemblies typically uses electric-motor-powered moving tracks or conveyor belts to move partially complete products to workers, who perform simple repetitive tasks. It improves on earlier high-output, continuous-flow mass production made possible by the steam engine.

Mass production of fluid and particulate matter typically involves pipes with centrifugal pumps or screw conveyors (augers) to transfer raw materials or partially complete product between vessels. Fluid flow processes such as oil refining and bulk materials such as wood chips and pulp are automated using a system of process control which uses various instruments to measure variables such as temperature, pressure, volumetric throughput and level, providing feedback to a controller that holds a set point.

Bulk materials such as coal, ores, grains and wood chips are handled by belt, chain, pneumatic or screw conveyors, bucket elevators and mobile equipment such as front end loaders. Materials on pallets are handled with fork lifts. Also used for handling heavy items like reels of paper, steel or machinery are electric overhead cranes, sometimes called bridge cranes because they span large factory bays.

Mass production is capital intensive and energy intensive, as it uses a high proportion of machinery and energy in relation to workers. It is also usually automated to the highest extent possible. With fewer labour costs and a faster rate of production, capital and energy are increased while total expenditure per unit of product is decreased. However, the machinery that is needed to set up a mass production line (such as robots and machine presses) is so expensive that there must be some assurance that the product is to be successful to attain profits.

One of the descriptions of mass production is that "the skill is built into the tool", which means that the worker using the tool need not have the skill. For example, in the 19th or early 20th century, this could be expressed as "the craftsmanship is in the workbench itself" (not the training of the worker). Rather than having a skilled worker measure every dimension of each part of the product against the plans or the other parts as it is being formed, there were jigs ready at hand to ensure that the part was made to fit this set-up. It had already been checked that the finished part would be to specifications to fit all the other finished parts—and it would be made more quickly, with no time spent on finishing the parts to fit one another. Later, once computerized control came about (for example, CNC), jigs were obviated, but it remained true that the skill (or knowledge) was built into the tool (or process, or documentation) rather than residing in the worker's head. This is the specialized capital required for mass production; each workbench and set of tools (or each CNC cell, or each fractionating column) is different (fine-tuned to its task).

Net Present Value (NPV)

In finance, the net present value (NPV) or net present worth (NPW) [1] of a time series of cash flows, both incoming and outgoing, is defined as the sum of the present values (PVs) of the individual cash flows. In the case when all future cash flows are incoming (such as coupons and principal of a bond) and the only outflow of cash is the purchase price, the NPV is simply the PV of future cash flows minus the purchase price (which is its own PV). NPV is a central tool in discounted cash flow (DCF) analysis, and is a standard method for using the time value of money to appraise long-term projects. Used for capital budgeting, and widely throughout economics, finance, and accounting, it measures the excess or shortfall of cash flows, in present value terms, once financing charges are met.

The NPV of a sequence of cash flows takes as input the cash flows and a discount rate or discount curve and outputs a price; the converse process in DCF analysis - taking a sequence of cash flows and a price as input and inferring as output a discount rate (the discount rate which would yield the given price as NPV) - is called the yield, and is more widely used in bond trading.

Formula

Each cash inflow/outflow is discounted back to its present value (PV). Then they are summed. Therefore NPV is the sum of all terms,

Where

t - the time of the cash flow

i - the discount rate (the rate of return that could be earned on an investment in the financial markets with similar risk.)

R_t - the net cash flow (the amount of cash, inflow minus outflow) at time t. For educational purposes, R₀ is commonly placed to the left of the sum to emphasize its role as (minus) the investment.

The result of this formula if multiplied with the Annual Net cash in-flows and reduced by Initial Cash outlay will be the present value but in case where the cash flows are not equal in amount then the previous formula will be used to determine the present value of each cash flow separately. Any cash flow within 12 months will not be discounted for NPV purpose.[2]

The discount rate

Main article: Discount rate

The rate used to discount future cash flows to the present value is a key variable of this process.

A firm's weighted average cost of capital (after tax) is often used, but many people believe that it is appropriate to use higher discount rates to adjust for risk or other factors. A variable discount rate with higher rates applied to cash flows occurring further along the time span might be used to reflect the yield curve premium for long-term debt.

Another approach to choosing the discount rate factor is to decide the rate which the capital needed for the project could return if invested in an alternative venture. If, for example, the capital required for Project A can earn five percent elsewhere, use this discount rate in the NPV calculation to allow a direct comparison to be made between Project A and the alternative. Related to this concept is to use the firm's Reinvestment Rate. Reinvestment rate can be defined as the rate of return for the firm's investments on average. When analyzing projects in a capital constrained environment, it may be appropriate to use the reinvestment rate rather than the firm's weighted average cost of capital as the discount factor. It reflects opportunity cost of investment, rather than the possibly lower cost of capital.

An NPV calculated using variable discount rates (if they are known for the duration of the investment) better reflects the real situation than one calculated from a constant discount rate for the entire investment duration. Refer to the tutorial article written by Samuel Baker [3] for more detailed relationship between the NPV value and the discount rate.

For some professional investors, their investment funds are committed to target a specified rate of return. In such cases, that rate of return should be selected as the discount rate for the NPV calculation. In this way, a direct comparison can be made between the profitability of the project and the desired rate of return.

To some extent, the selection of the discount rate is dependent on the use to which it will be put. If the intent is simply to determine whether a project will add value to the company, using the firm's weighted average cost of capital may be appropriate. If trying to decide between alternative investments in order to maximize the value of the firm, the corporate reinvestment rate would probably be a better choice.

Using variable rates over time, or discounting "guaranteed" cash flows differently from "at risk" cash flows may be a superior methodology, but is seldom used in practice. Using the discount rate to adjust for risk is often difficult to do in practice (especially internationally), and is difficult to do well. An alternative to using discount factor to adjust for risk is to explicitly correct the cash flows for the risk elements using rNPV or a similar method, then discount at the firm's rate.

NPV in decision making

NPV is an indicator of how much value an investment or project adds to the firm. With a particular project, if R_t is a positive value, the project is in the status of discounted cash inflow in the time of t . If R_t is a negative value, the project is in the status of discounted cash outflow in the time of t . Appropriately risked projects with a positive NPV could be accepted. This does not necessarily mean that they should be undertaken since NPV at the cost of capital may not account for opportunity cost, i.e. comparison with other available investments. In financial theory, if there is a choice between two mutually exclusive alternatives, the one yielding the higher NPV should be selected. If... It means... Then...

$NPV > 0$ the investment would add value to the firm the project may be accepted

$NPV < 0$ the investment would subtract value from the firm the project should be rejected

$NPV = 0$ the investment would neither gain nor lose value for the firm we should be indifferent in the decision whether to accept or reject the project. This project adds no monetary value. Decision should be based on other criteria, e.g. strategic positioning or other factors not explicitly included in the calculation.

Current Account Balance

In economics, the current account is one of the two primary components of the balance of payments, the other being the capital account. The current account is the sum of the balance of trade (exports minus imports of goods and services), net factor income (such as interest and dividends) and net transfer payments (such as foreign aid). You may refer to the list of countries by current account balance.

The current account balance is one of two major measures of the nature of a country's foreign trade (the other being the net capital outflow). A current account surplus increases a country's net foreign assets by the corresponding amount, and a current account deficit does the reverse. Both government and private payments are included in the calculation. It is

called the current account because goods and services are generally consumed in the current period. [1]

The balance of trade is the difference between a nation's exports of goods and services and its imports of goods and services, if all financial transfers, investments and other components are ignored. A Nation is said to have a trade deficit if it is importing more than it exports.

Positive net sales abroad generally contributes to a current account surplus; negative net sales abroad generally contributes to a current account deficit. Because exports generate positive net sales, and because the trade balance is typically the largest component of the current account, a current account surplus is usually associated with positive net exports. This however is not always the case with secluded economies such as that of Australia featuring an income deficit larger than its trade deficit [2].

The net factor income or income account, a sub-account of the current account, is usually presented under the headings income payments as outflows, and income receipts as inflows. Income refers not only to the money received from investments made abroad (note: investments are recorded in the capital account but income from investments is recorded in the current account) but also to the money sent by individuals working abroad, known as remittances, to their families back home. If the income account is negative, the country is paying more than it is taking in interest, dividends, etc.

The difference between Canada's income payments and receipts have been declining exponentially as well since its central bank in 1998 began its strict policy not to intervene in the Canadian Dollar's foreign exchange.[3]

The various subcategories in the income account are linked to specific respective subcategories in the capital account, as income is often composed of factor payments from the ownership of capital (assets) or the negative capital (debts) abroad. From the capital account, economists and central banks determine implied rates of return on the different types of capital. The United States, for example, gleans a substantially larger rate of return from foreign capital than foreigners do from owning United States capital.

In the traditional accounting of balance of payments, the current account equals the change in net foreign assets. A current account deficit implies a paralleled reduction of the net foreign assets.

current account = changes in net foreign assets

Action to reduce a substantial current account deficit usually involves increasing exports (goods going out of a country and entering abroad countries) or decreasing imports (goods coming from a foreign country into a country). Firstly, This is generally accomplished directly through import restrictions, quotas, or duties (though these may indirectly limit exports as well), or subsidizing exports. Influencing the exchange rate to make exports cheaper for foreign buyers will indirectly increase the balance of payments. This is primarily accomplished by devaluing the domestic currency example: The chinese government policy of pegging renminbi to dollar to ensure competitive export policy. Also,

Currency Wars, a phenomenon evident in post recessionary markets is a protectionist policy, whereby countries devalue their currencies to ensure export competitiveness. Secondly, current account deficit are reduced by promoting investor friendly environment i.e. Foreign Direct Investment (FDI), Foreign Institutional Investors (FII), the income from these foreign investments positively contributes to current account. Thirdly, Adjusting government spending to favor domestic suppliers is also effective.

Less obvious methods to reduce a current account deficit include measures that increase domestic savings (or reduced domestic borrowing), including a reduction in borrowing by the national government.

CAMELS ratings

The CAMELS ratings or Camels rating is a US supervisory rating of the bank's overall condition used to classify the nation's fewer than 8,000 banks. This rating is based on financial statements of the bank and on-site examination by regulators like the Fed, the OCC and FDIC. The scale is from 1 to 5 with 1 being strongest and 5 being weakest. These ratings are not released to the public but only to the top management of the banking company to prevent a bank run on a bank which has a bad CAMELS rating. [1]

It is being used by the United States government in response to the global financial crisis of 2008 to help it decide which banks to provide special help for and which to not as part of its capitalization program authorized by the Emergency Economic Stabilization Act of 2008.

Credit unions in the United States use the similar CAMEL rating system.

Components

The components of a bank's condition that are assessed: [1]

- (C) Capital adequacy,
- (A) Asset quality,
- (M) Management,
- (E) Earnings,
- (L) Liquidity and
- (S) Sensitivity to market risk

based these features Credit rating agencies rate instruments proposed to issue by the respective company.

Basel II

Basel II is the second of the Basel Accords, which are recommendations on banking laws and regulations issued by the Basel Committee on Banking Supervision. The purpose of

Basel II, which was initially published in June 2004, is to create an international standard that banking regulators can use when creating regulations about how much capital banks need to put aside to guard against the types of financial and operational risks banks face. Advocates of Basel II believe that such an international standard can help protect the international financial system from the types of problems that might arise should a major bank or a series of banks collapse. In theory, Basel II attempted to accomplish this by setting up risk and capital management requirements designed to ensure that a bank holds capital reserves appropriate to the risk the bank exposes itself to through its lending and investment practices. Generally speaking, these rules mean that the greater risk to which the bank is exposed, the greater the amount of capital the bank needs to hold to safeguard its solvency and overall economic stability.

Objective

The final version aims at:

Ensuring that capital allocation is more risk sensitive;

Separating operational risk from credit risk, and quantifying both;

Attempting to align economic and regulatory capital more closely to reduce the scope for regulatory arbitrage.

While the final accord has largely addressed the regulatory arbitrage issue, there are still areas where regulatory capital requirements will diverge from the economic.

Basel II has largely left unchanged the question of how to actually define bank capital, which diverges from accounting equity in important respects. The Basel I definition, as modified up to the present, remains in place.

The Accord in operation

Basel II uses a "three pillars" concept – (1) minimum capital requirements (addressing risk), (2) supervisory review and (3) market discipline.

The Basel I accord dealt with only parts of each of these pillars. For example: with respect to the first Basel II pillar, only one risk, credit risk, was dealt with in a simple manner while market risk was an afterthought; operational risk was not dealt with at all.

The first pillar

The first pillar deals with maintenance of regulatory capital calculated for three major components of risk that a bank faces: credit risk, operational risk, and market risk. Other risks are not considered fully quantifiable at this stage.

The credit risk component can be calculated in three different ways of varying degree of sophistication, namely standardized approach, Foundation IRB and Advanced IRB. IRB stands for "Internal Rating-Based Approach".

For operational risk, there are three different approaches - basic indicator approach or BIA, standardized approach or TSA, and the internal measurement approach (an advanced form of which is the advanced measurement approach or AMA).

For market risk the preferred approach is VaR (value at risk).

As the Basel 2 recommendations are phased in by the banking industry it will move from standardized requirements to more refined and specific requirements that have been developed for each risk category by each individual bank. The upside for banks that do develop their own bespoke risk measurement systems is that they will be rewarded with potentially lower risk capital requirements. In future there will be closer links between the concepts of economic profit and regulatory capital.

Credit Risk can be calculated by using one of three approaches:

1. Standardized Approach
2. Foundation IRB (Internal Ratings Based) Approach
3. Advanced IRB Approach

The standardized approach sets out specific risk weights for certain types of credit risk. The standard risk weight categories used under Basel 1 were 0% for government bonds, 20% for exposures to OECD Banks, 50% for first lien residential mortgages and 100% weighting on consumer and loans unsecured commercial loans. Basel II introduced a new 150% weighting for borrowers with lower credit ratings. The minimum capital required remained at 8% of risk weighted assets, with Tier 1 capital making up not less than half of this amount.

Banks that decide to adopt the standardized ratings approach must rely on the ratings generated by external agencies. Certain banks used the IRB approach as a result.

The second pillar

The second pillar deals with the regulatory response to the first pillar, giving regulators much improved 'tools' over those available to them under Basel I. It also provides a framework for dealing with all the other risks a bank may face, such as systemic risk, pension risk, concentration risk, strategic risk, reputational risk, liquidity risk and legal risk, which the accord combines under the title of residual risk. It gives banks a power to review their risk management system.

The third pillar

This pillar aims to promote greater stability in the financial system

Market discipline supplements regulation as sharing of information facilitates assessment of the bank by others including investors, analysts, customers, other banks and rating

agencies. It leads to good corporate governance. The aim of pillar 3 is to allow market discipline to operate by requiring lenders to publicly provide details of their risk management activities, risk rating processes and risk distributions. It sets out the public disclosures that banks must make that lend greater insight into the adequacy of their capitalization. When marketplace participants have a sufficient understanding of a bank's activities and the controls it has in place to manage its exposures, they are better able to distinguish between banking organizations so that they can reward those that manage their risks prudently and penalize those that do not. This section requires expansion.

On September 30, 2005, the four US Federal banking agencies (the Office of the Comptroller of the Currency, the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of Thrift Supervision) announced their revised plans for the U.S. implementation of the Basel II accord. This delays implementation of the accord for US banks by 12 months. [1]

On November 15, 2005, the committee released a revised version of the Accord, incorporating changes to the calculations for market risk and the treatment of double default effects. These changes had been flagged well in advance, as part of a paper released in July 2005. [2]

On July 4, 2006, the committee released a comprehensive version of the Accord, incorporating the June 2004 Basel II Framework, the elements of the 1988 Accord that were not revised during the Basel II process, the 1996 Amendment to the Capital Accord to Incorporate Market Risks, and the November 2005 paper on Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework. No new elements have been introduced in this compilation. This version is now the current version. [3]

On November 1, 2007, the Office of the Comptroller of the Currency (U.S. Department of the Treasury) approved a final rule implementing the advanced approaches of the Basel II Capital Accord. This rule establishes regulatory and supervisory expectations for credit risk, through the Internal Ratings Based Approach (IRB), and operational risk, through the Advanced Measurement Approach (AMA), and articulates enhanced standards for the supervisory review of capital adequacy and public disclosures for the largest U.S. banks. [4]

On July 16, 2008 The federal banking and thrift agencies (The Board of Governors of the Federal Reserve System; the Federal Deposit Insurance Corporation; the Office of the Comptroller of the Currency, and; the Office of Thrift Supervision) issued a final guidance outlining the supervisory review process for the banking institutions that are implementing the new advanced capital adequacy framework (known as Basel II). The final guidance, relating to the supervisory review, is aimed at helping banking institutions meet certain qualification requirements in the advanced approaches rule, which took effect on April 1, 2008. [5]

For public consultation, a series of proposals to enhance the Basel II framework was announced by the Basel Committee. It releases a consultative package that includes: the

revisions to the Basel II market risk framework; the guidelines for computing capital for incremental risk in the trading book; and the proposed enhancements to the Basel II framework.[6]

July 8–9, 2009 update

A final package of measures to enhance the three pillars of the Basel II framework and to strengthen the 1996 rules governing trading book capital was issued by the newly expanded Basel Committee. These measures include the enhancements to the Basel II framework, the revisions to the Basel II market-risk framework and the guidelines for computing capital for incremental risk in the trading book. [7]

Basel II and the regulators

One of the most difficult aspects of implementing an international agreement is the need to accommodate differing cultures, varying structural models, and the complexities of public policy and existing regulation. Banks' senior management will determine corporate strategy, as well as the country in which to base a particular type of business, based in part on how Basel II is ultimately interpreted by various countries' legislatures and regulators.

To assist banks operating with multiple reporting requirements for different regulators according to geographic location, there are several software applications available. These include capital calculation engines and extend to automated reporting solutions which include the reports required under COREP/FINREP.

For example, U.S. FDIC Chair Sheila Bair explained in June 2007 the purpose of capital adequacy requirements for banks, such as the accord: "There are strong reasons for believing that banks left to their own devices would maintain less capital—not more—than would be prudent. The fact is, banks do benefit from implicit and explicit government safety nets. Investing in a bank is perceived as a safe bet. Without proper capital regulation, banks can operate in the marketplace with little or no capital. And governments and deposit insurers end up holding the bag, bearing much of the risk and cost of failure. History shows this problem is very real ... as we saw with the U.S. banking and S & L crisis in the late 1980s and 1990s. The final bill for inadequate capital regulation can be very heavy. In short, regulators can't leave capital decisions totally to the banks. We wouldn't be doing our jobs or serving the public interest if we did.[8]

Implementation progress

Regulators in most jurisdictions around the world plan to implement the new Accord, but with widely varying timelines and use of the varying methodologies being restricted. The United States of America's various regulators have agreed on a final approach.[9] They have required the Internal Ratings-Based approach for the largest banks, and the standardized approach will not be available to anyone.(See <http://www.federalreserve.gov/newsevents/press/bcreg/20080626b.htm> for an update on proposed Standardized Approach)

In India, RBI has implemented the Basel II standardized norms on 31 March 2009 and is moving to internal ratings in credit and AMA norms for operational risks in banks. Existing RBI norms for banks in India (as on Sept 2010): Common equity (incl of buffer): 3.6% (Buffer Basel 2 requirement requirements are zero.); Tier 1 requirement: 6%. Total Capital: 9 % of risk weighted assets. Basel 3 asks for those ratios as 7-8.5%(4.5% +2.5%(conservation buffer) + 0-2.5%(seasonal buffer)) and 8.5-11% for tier 1 cap and 10.5 to 13.5 for total capital' (Proposed Basel III Guidelines: A Credit Positive for Indian)'**Bold text Banks In response to a questionnaire released by the Financial Stability Institute (FSI), 95 national regulators indicated they were to implement Basel II, in some form or another, by 2015.[10]**

The European Union has already implemented the Accord via the EU Capital Requirements Directives and many European banks already report their capital adequacy ratios according to the new system. All the credit institutions adopted it by 2008.

Australia, through its Australian Prudential Regulation Authority, implemented the Basel II Framework on 1 January 2008.[11]

Inferior good

In consumer theory, an inferior good is a good that decreases in demand when consumer income rises, unlike normal goods, for which the opposite is observed.[1] Normal goods are those for which consumers' demand increases when their income increases. [2] Inferiority, in this sense, is an observable fact relating to affordability rather than a statement about the quality of the good. As a rule, too much of a good thing is easily achieved with such goods, and as more costly substitutes that offer more pleasure or at least variety become available, the use of the inferior goods diminishes.

Depending on consumer or market indifference curves, the amount of a good bought can either increase, decrease, or stay the same when income increases.

Examples

Cheaper cars are examples of the inferior goods. Consumers will generally prefer cheaper cars when their income is constricted. But as a consumer's income increases the demand of the cheap cars will decrease, but on the other hand demand of costly cars will increase, so cheap cars are inferior goods. Inter-city bus service is also an example of an inferior good. This form of transportation is cheaper than air or rail travel, but is more time-consuming. When money is constricted, travelling by bus becomes more acceptable, but when money is more abundant than time, more rapid transport is preferred.

Inexpensive foods like bologna, hamburger, mass-market beer, frozen dinners, and canned goods are additional examples of inferior goods. As incomes rise, one tends to purchase more expensive, appealing and nutritious foods[citation needed]. Likewise, goods and services used by poor people for which richer people have alternatives exemplify inferior goods. As a rule, used and obsolete goods (but not antiques) marketed to persons of low income as closeouts are inferior goods at the time even if they had earlier been normal goods or even luxury goods.

Others are very inconsistent across geographic regions or cultures. The potato, for example, generally conforms to the demand function of an inferior good in the Andean region where the crop originated. People of higher incomes and/or those who have migrated to coastal areas are more likely to prefer other staples such as rice or wheat products as they can afford them. However, in several countries of Asia, such as Bangladesh, potato is not an inferior good, but rather a relatively expensive source of calories and a high-prestige food, especially when eaten in the form of "French fries" by urban elites.

Some inferior goods are so consistent that they can be seen as economic indicators. One such is instant noodles, where an early 2005 increase in the Thai "Mama Noodles Index" (the number of the popular Mama-brand instant noodles sold in that country) was seen as a sign of weakness after about ten years of stability.

Recently, there has been some interest in cataloging and identifying inferior goods in the United States. One such project, developed by economist.com, seeks to document characteristics that would identify goods as inferior. In 1997, several Michigan scholars from Western Michigan University identified many commonplace grocery store goods as inferior. Some of the goods identified as inferior goods are:

Tahitian Treat: A low-cost carbonated fruit punch beverage.

Thirst Rockers: A Kroger brand of imitation juice beverage in gallon milk jugs.

"Value-Time" Ice Cream: Ice cream sold in 2.5 gallon plastic pails at grocery stores, with an emphasis on value and quantity as opposed to quality or advertising.

Cosmic brownies: Low cost cakes resembling small brownies manufactured by the Little Debbie Company.

Faygo Brand soda: A low cost non-advertised soda pop manufactured in Detroit, MI.

Internal rate of return

The internal rate of return (IRR) is a rate of return used in capital budgeting to measure and compare the profitability of investments. It is also called the discounted cash flow rate of return (DCFROR) or simply the rate of return (ROR).[1] In the context of savings and loans the IRR is also called the effective interest rate. The term internal refers to the fact that its calculation does not incorporate environmental factors (e.g., the interest rate or inflation).

Definition

The internal rate of return on an investment or project is the "annualized effective compounded return rate" or discount rate that makes the net present value (NPV) of all cash flows (both positive and negative) from a particular investment equal to zero.

In more specific terms, the IRR of an investment is the interest rate at which the net present value of costs (negative cash flows) of the investment equals the net present value of the benefits (positive cash flows) of the investment.

Internal rates of return are commonly used to evaluate the desirability of investments or projects. The higher a project's internal rate of return, the more desirable it is to undertake

the project. Assuming all projects require the same amount of up-front investment, the project with the highest IRR would be considered the best and undertaken first.

A firm (or individual) should, in theory, undertake all projects or investments available with IRRs that exceed the cost of capital. Investment may be limited by availability of funds to the firm and/or by the firm's capacity or ability to manage numerous projects.

Uses

Because the internal rate of return is a rate quantity, it is an indicator of the efficiency, quality, or yield of an investment. This is in contrast with the net present value, which is an indicator of the value or magnitude of an investment.

An investment is considered acceptable if its internal rate of return is greater than an established minimum acceptable rate of return or cost of capital. In a scenario where an investment is considered by a firm that has equity holders, this minimum rate is the cost of capital of the investment (which may be determined by the risk-adjusted cost of capital of alternative investments). This ensures that the investment is supported by equity holders since, in general, an investment whose IRR exceeds its cost of capital adds value for the company (i.e., it is economically profitable).

Calculation

Given a collection of pairs (time, cash flow) involved in a project, the internal rate of return follows from the net present value as a function of the rate of return. A rate of return for which this function is zero is an internal rate of return.

Given the (period, cash flow) pairs (n, C_n) where n is a positive integer, the total number of periods N , and the net present value NPV, the internal rate of return is given by r in:

The period is usually given in years, but the calculation may be made simpler if r is calculated using the period in which the majority of the problem is defined (e.g., using months if most of the cash flows occur at monthly intervals) and converted to a yearly period thereafter.

Any fixed time can be used in place of the present (e.g., the end of one interval of an annuity); the value obtained is zero if and only if the NPV is zero.

In the case that the cash flows are random variables, such as in the case of a life annuity, the expected values are put into the above formula.

Often, the value of r cannot be found analytically. In this case, numerical methods or graphical methods must be used.

Business Economics

Business economics is defined as the study of how businesses manage scarce resources. Microeconomics is the study of the decisions of individuals, households, and businesses in specific markets, whereas macroeconomics is the study of the overall functioning of an economy such as basic economic growth, unemployment, or inflation. Scarcity in microeconomics is not the same as poverty. It arises from the assumption of very large (or infinite) wants or desires, and the fact that resources to obtain goods and services are limited.

- wants exceed resources necessary to obtain them
- therefore we must make choices
- every choice leads to a cost

Range of Business Economics

In general terms, Business Economics deals with issues such as: the ways markets work; what firms do, what their motives are, how they perform; and the role of government in regulating business activity". The program at Harvard University uses economic methods to analyze practical aspects of business, including business administration, management, and related fields of economics.

The University of Miami defines Business Economics as involving the study of how we use our resources for the production, distribution, and consumption of goods and services. This requires business economists to analyze social institutions, banks, the stock market, the government and they look at problems connected with labor negotiations, taxes, international trade, and urban and environmental issues.

Courses at the University of Manchester interpret Business Economics to be concerned with the economic analysis of how businesses contribute to welfare of society rather than on the welfare of an individual or a business. This is done via an examination of the relationship between ownership, control and firm objectives; theories of the growth of the firm; the behavioral theory of the firm; theories of entrepreneurship; the factors that influence the structure, conduct and performance of business at the industry level.

Many Reasons to Study Economics

Economics is an insightful study of how people behave and organizations operate under constraints of resources. It provides powerful tools to understand and analyze many aspects of our lives and help us to be an informed, perceptive decision-maker. Decision-making is an integral part of business or governmental organizations. The economics department at Georgia State University offers a modern curriculum to prepare you for future endeavors and to meet unforeseen challenges successfully. There are many good reasons to study economics:

(1) To be a knowledgeable worker, consumer, investor, and citizen

Economics training helps develop methodical ways of thinking and problem solving which can be used in our lives as effective members of the workforce, responsible and knowledgeable citizens, informed consumers, savers, and investors, and perceptive participants in the global economy.

(2) To acquire a set of important skills for career-building

A key element for getting a job and succeeding in a career is your set of desirable skills. Economics training offers individuals a terrific set of marketable skills. They include written communication and presentation skills, quantitative communication skills, and analytical problem-solving skills. Learning to communicate your ideas in writing and presentation to a broad range of audiences is a key component of our economic curriculum. Economics majors are also trained to understand numerical data and recognize their importance, use a variety of data analysis and computing tools, and communicate quantitative information to others. Moreover, there is no better major to acquire analytical problem-solving skills than economics. Economic principles can be applied to identify the core elements of many problems confronting business and government and to formulate effective decisions to tackle those problems.

(3) To seek employment that interests you

Finding employment that interests you can be crucial for a successful and fulfilling career. Studying economics is exciting and fun, and it opens a wide variety of career opportunities for individuals. Economics graduates have gone on to rewarding professional careers in industry, trade, banking and finance, law, consulting, government, research, and education. The career flexibility is coupled with the fact that economists often receive high salaries.

(4) To gain a solid foundation for other advanced fields of study

Because of vigorous and comprehensive training, economics majors are sought by not only employers but also graduate schools. Graduate study in law, business, politics, or public policy commonly demands logical thinking abilities and strong investigative and quantitative skills. Indeed, economics is one of the most highly respected academic disciplines

(5) FLEXIBLE

With the major changes that have taken place in the world of work, the rapid changes in technology and globalization, it is not uncommon for individuals to make several career changes during their lives. Today's hot specialized degree has often become tomorrow's target for downsizing. Companies that were relatively unchallenged in the domestic market have suffered as a result of global competition. As a result, experts in career development recommend that one seriously consider a flexible degree such as economics.

(6) REWARDING

Majors in economics receive average starting salaries that are in the upper range of salary offers made to majors with other business degrees and significantly above most majors in other areas of the liberal arts.

(7) CHALLENGING

Economics is a discipline in which you learn a unique way of thinking. This unique way of thinking is a primary reason that economics is also a flexible degree. Economic concepts have been applied to a number of different areas that would, at first, seem totally unrelated to economics. However, the concepts of economics are critical to finding solutions to problems in a wide variety of areas.

(8) RICH IN SKILLS

(a) Analytical/Critical Thinking Skills - There is no better major for learning analytical problem solving than economics. You have learned how to take a problem, and break it down into its separate elements (*ceteris paribus*). You have learned that economics has a core set of tools that can be applied in a wide variety of settings (the same tools apply to both consumer and firm behavior, for example). All of business is problem solving, and this is the expertise you have learned from the Logical constructs in economics.

(b) Quantitative Skills (Mathematical and Statistical Technics) - This means the ability to understand numbers and their importance, and the ability to communicate quantitative information to others. All the graphs in economics represent quantitative concepts, and as an economics major you will certainly have no fear of graphs. Further, many classes use explicit numerical problem solving. You also have the opportunity to explicitly learn a wide range of statistical and computing tools, in Statistics, and Econometrics. You have the opportunity to explicitly learn a broad range of mathematical tools in Mathematical Economics, Game Theory, Experimental Economics and a wide variety of other courses.

(c) Communication Skills (Written and Oral) - This means communicating with a variety of audiences in a variety of formats. In economics, you will learn to communicate your ideas in writing- through essay exams, papers, and homework. In addition, the small class sizes in the upper level classes allows you the opportunity to speak in class. All of these tools improve your interpersonal communication skills. Some classes also present the opportunity to work with other students explicitly.

On a Lighter Vein: TOP 10 REASONS TO STUDY ECONOMICS

1. Economists are armed and dangerous: "Watch out for our invisible hands."
2. Economists can supply it on demand.
3. You can talk about money without even having to make any.
4. You get to say "trickle down" with a straight face.

5. Mick Jagger and Arnold Schwarzenegger both studied economics and look how they turned out.
6. When you are in the unemployment line, at least you will know why you are there.
7. If you rearrange the letters in "ECONOMICS", you get "COMIC NOSE".
8. Although ethics teaches that virtue is its own reward, in economics we get taught that reward is its own virtue.
9. When you get drunk, you can tell everyone that you are just researching the law of diminishing marginal utility.
10. When you call 1-900-LUV-ECON and get Kandi Keynes, you will have something to talk about.