MaE-MiE & MEA Script

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This script is a collection of texts to support the lecture in macroeconomics, microeconomics and advanced managerial economics. Most of the texts are copied from free sources, mainly from internet. For simplification quotation marks are not used even for short quotations.

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Table of contents

1 Economics: definitions, introduction and basic problems

1.1 Economics

Economics is the science that deals with the production, allocation, and use of goods and services. It is important to study how resources can best be distributed to meet the needs of the greatest number of people. As we are more connected globally to one another, the study of economics becomes extremely important. While there are many subdivisions in the study of economics, two major ones are macroeconomics and microeconomics.[1]

1.1.1 Macroeconomics

Macroeconomics is the branch of economics that studies the behaviour and performance of an economy as a whole. It focuses on the aggregate changes in the economy such as unemployment, growth rate, gross domestic product and inflation. Macroeconomics analyses all aggregate indicators and the microeconomic factors that influence the economy. Government and corporations use macroeconomic models to help in formulating of economic policies and strategies.[2]

1.1.2 Microeconomics

Microeconomics is the study of individuals, households and firms' behaviour in decision making and allocation of resources. It generally applies to markets of goods and services and deals with individual and economic issues. Microeconomic study deals with what choices people make, what factors influence their choices and how their decisions affect the goods markets by affecting the price, the supply and demand.[3] In particular, the following aspects of microeconomic theory are relevant:[4]

- theory of the firm
- theory of consumer behaviour (demand)
- production and cost theory (supply)
- price theory
- market structure and competition theory

1.2 Business Administration

Business administration is the process of managing a business or non-profit organization so that it remains stable and continues to grow. The administration of a business includes the performance or management of business operations and decision making as well as the efficient organization of people and other resources to direct activities toward common goals and objectives. In general, administration refers to the broader management function, including the associated finance, personnel and MIS services. In some analyses, management is viewed as a subset of administration, specifically associated with the technical and operational aspects of an organization, distinct from executive or strategic functions. Alternatively, administration can refer to the bureaucratic or operational performance of routine office tasks, usually internally oriented and reactive rather than proactive. Administrators, broadly speaking, engage in a common set of functions to meet the organization's goals.[5]

1.3 Managerial Economics

So what is managerial economics? Many different definitions have been given but most of them involve the application of economic theory and methods to business decision-making. As such it can

[1] (mcwdn.org - Economics, 2015)
[2] (The Economic Times - Macroeconomics, 2015)
[3] (The Economic Times - Microeconomics, 2015)
[4] (Wilkinson, 2005, p. 8)
[5] (Wikipedia - Business Administration, 2015)

be seen as a means to an end by managers, in terms of finding the most efficient way of allocating their scarce resources and reaching their objectives. However, the definition above might seem to be a little narrow in scope… The term 'business' must be defined very broadly in this context: it applies to any situation where there is a transaction between two or more parties. Of course this widens the scope of the concept beyond the bounds that many people find comfortable: it includes taking someone on a date, playing a game with one's children in the park, going to confession in a church, asking a friend to help out at work, agreeing to look after a colleague's cat while they are away, taking part in a neighbourhood watch scheme. In all cases, costs and benefits occur, however intangible, and a decision must be made between different courses of action.

As an approach to decision-making, managerial economics is related to economic theory, decision sciences and business functions.[6]

1.3.1 Relationship with economic theory

The main branch of economic theory with which managerial economics is related is microeconomics, which deals essentially with how markets work and interactions between the various components of the economy. There is one main difference between the emphasis of microeconomics and that of managerial economics: the former tends to be descriptive, explaining how markets work and what firms do in practice, while the latter is often prescriptive, stating what firms should do, in order to reach certain objectives.

At this point it is necessary to make another very important distinction: that between positive and normative economics. This is sometimes referred to as the 'is/ought' distinction, but this is actually somewhat misleading. Essentially positive statements are factual statements whose truth or falsehood can be verified by empirical study or logic. Normative statements involve a value judgement and cannot be verified by empirical study or logic.[7]

1.3.2 Relationship with decision sciences

The decision sciences provide the tools and techniques of analysis used in managerial economics. The most important aspects are as follows:

- numerical and algebraic analysis
- optimization
- statistical estimation and forecasting
- analysis of risk and uncertainty
- discounting and time-value-of-money techniques[8]

1.3.3 Relationship with business functions

All firms consist of organizations that are divided structurally into different departments or units, even if this is not necessarily performed on a formal basis. Typically the units involved are:

- production and operations
- marketing
- finance and accounting
- human resources

[6] (Wilkinson, 2005, pp. 7-8)
[7] (Wilkinson, 2005, pp. 8-9)
[8] (Wilkinson, 2005, p. 10)

All of these functional areas can apply economic theories and methods, in the context of the particular situation and tasks that they have to perform.[9]

Traditionally, pricing has formed the central core of managerial economics, although this narrow focus is somewhat misleading in terms of the breadth of analysis that is possible. As the various topics are examined, further applications and extensions of analysis will be discussed. In order to examine pricing it is necessary to consider demand and supply forces; in managerial economics supply forces are discussed under the theory of costs. In order to consider demand we must first consider consumer theory and in order to consider costs we must first consider production theory.[10]

1.4 Scarcity and choice

Human beings have unlimited wants and needs[11]. That is to say that there is never such a time that a human being is satisfied and not in need of anything. On the other hand, resources available in nature, which should be used to meet those human wants and needs, are limited. The available resources can never be enough to satisfy all human wants and needs. This phenomenon, where there are unlimited human wants and needs which are to be met by very limited resources, is essentially what economists call scarcity. Scarcity is referred to as the fundamental economic problem, and all economic activities revolve around trying to solve this problem. In view of scarcity, a good which is usable but in abundant supply may not qualify to be called an economic good. Air and water, for example, are just 'goods' in the sense that they are readily available and cannot be deemed to be scarce. Economic goods are presumed to be scarce in supply, that is to say, they cannot at one time meet the demand of humans. The concept of scarcity is so vital in modern economics that it informs a later-day definition of economics, which states that economics is the study of human actions and behaviour as a relationship between ends and scarce means which have alternative uses.

Along with scarcity comes another equally important concept in economics: Choice. Choice comes about as a result of scarcity, and in a way, choice is informed by these circumstances. Here is how it comes about: Since human wants and needs are unlimited and resources limited, it emerges that one cannot be able to practically meet all their wants and needs at any one time. Because of this, it becomes inevitable for someone to choose between the many unlimited wants and needs which one to satisfy at any given moment. This, in economics, is not just a conscious decision; it is an inevitable action that one has to take. Whether or not you consciously decide to skip something, you should realize that somehow you can only do one thing at a time. This is very important.

Since you make a choice of doing something, or fulfilling a certain want or need, it turns out that at any one time, there is a certain want (resp. need) that you have to ignore, or forego, in order to fulfil another want or need. When you wake up to go to work or school in the morning, for example, you probably would have loved to sleep just a little more, but then you have to wake up and leave for work because you must earn a living. In this scenario, it can be rightly assumed that you have foregone sleep in order to go to work.

A famous phrase people use nowadays is 'there is no such a thing as free lunch', and that is perhaps the best way of saying it. Even if someone is offering to buy you lunch, you have to sacrifice time which you would have spent doing something else. Due to scarcity of resources, one therefore has to

[9] (Wilkinson, 2005, p. 10)
[10] (Wilkinson, 2005, p. 11)
[11] Needs are best thought of as physiological or biological requirements for maintaining life, such as the need for air, water, food, shelter, and sleep. Wants are then the psychological desires that are not essential for life but that make life just a little more enjoyable. (AmosWEB - Unlimited Wants and Needs, 2015)

make a choice of which want or need to satisfy. By making a choice, it is inevitable that one will have to forego another one. This option that has been foregone is usually called an opportunity cost.[12]

1.4.1 Minimum / maximum principle and the 'homo oeconomicus'

Scarcity forces us to think first before using a resource. We may then act according to two principles, the minimum and the maximum principle. The minimum principle states that a given result must be obtained with the minimum possible expenditure of resources. For this reason it is also known as the economic principle. In accordance with the minimum principle, the goal to be achieved (which, e.g. in dentistry, is the desired treatment outcome or medical outcome) is specified and the resources used for its achievement are to be kept to a minimum. Under the maximum principle, on the other hand, a fixed volume of resources is provided and the aim is to obtain the best possible – i. e. the maximum – outcome from them. Both principles are forms of the economic efficiency postulate, which embodies an ideal in the sphere of welfare economics. Departures from this ideal state are indicative of uneconomic functioning and wastage of resources.[13]

1.4.2 The concept of 'homo oeconomicus'

A 'homo oeconomicus' describes the rational human being assumed by some economists when deriving, explaining and verifying theories and models. Homo oeconomicus, or economic human, is the figurative human being characterized by the infinite ability to make rational decisions, thus following the economic principle only. Certain economic models have traditionally relied on the assumption that humans are rational and will attempt to maximize their utility for both monetary and non-monetary gains. Modern behavioural economists and neuro-economists, however, have demonstrated that human beings are, in fact, not rational in their decision making, and argue a "more human" subject (that makes somewhat predictable irrational decisions) would provide a more accurate tool for modelling human behaviour.[14]

1.4.3 Economic principle and prosperity

There are many definitions for prosperity in the economic literature. Many of them use material indicators such as the number of cars per capita, the consumption of energy, or indicators from the national accounts like GDP. Others use immaterial indicators such as education and health. The most general definition is concerning the satisfaction of needs: The more one need is satisfied or the more needs are satisfied the higher the level of prosperity is. Under the light of scarcity this implies that prosperity is higher if people follow the economic principle, thus avoiding to waste scarce resources and trying to get the most out of it. So it's clear: Following the economic principle leads to more prosperity.

1.5 Inflationary spiral

Economists are dealing with a nearly infinite number of problems when trying to predict the development of an economy. One of the biggest problems is inflation, to be discussed in more detail later. In the 70th many economies where facing a special kind of inflationary development: the inflationary spiral, also known as wage-price spiral or price-wage spiral. The dreaded inflationary spiral is a condition in which wages and prices rise in a continuing, self-perpetuating relationship that exerts inflationary pressure on an economy. In order for a wage-price spiral to occur, certain conditions in the economy must be present, including the widespread expectation of increasing prices.

[12] (AmosWEB - Unlimited Wants and Needs, 2015)
[13] (Springer Link - Economic Principle, 2015)
[14] (Investopedia - Homo Economicus, 2015)

When an economy is operating at near full employment and people have money to spend, demand for goods and services increases. To meet the demand, companies expand their businesses and hire more workers. However, at near full employment, most workers already have jobs. So companies have to lure workers with higher wages, which, of course, increases the companies' costs. The workers, resp. their unions, then push for higher wages to meet the higher prices and expected price hikes, which increases company costs again. Theoretically, this continues in an inflationary spiral until a loaf of bread costs the proverbial wheelbarrow full of cash.[15]

This development may continue for a certain time and prices will increase again and again. But just imagine that some wages are not increasing with the same speed, thus causing a loss of some peoples' purchasing power. As we will see later, in this case demand will in general decrease, leading to less production, less income and, again, less demand. So a downward spiral in economy will start, perhaps leading to a crisis. Every economist knows about this relationship between prices, demand, income and economic development. But nobody knows if and when this downward spiral may start. A nightmare for every economist and politician.

1.6 Economic research

The first step: Research in economics starts like research in any other science with the observation of a real world phenomenon.

The second step is to develop a background theory and a model to explain the observation. A model may best be described as a simplified image of the complex economic reality, aiming to show a part of the big picture and the relevant relationships. Simplification is very important because otherwise nobody, except some Nobel-laureates, will understand it. A very popular way of simplification is the so called 'c.p.-clause':

Ceteris paribus is a Latin phrase meaning "with other things the same" or "all other things being equal or held constant". A prediction or a statement about a causal, empirical, or logical relation between two states of affairs is ceteris paribus if it is acknowledged that the prediction, although usually accurate in expected conditions, can fail or the relation can be abolished by intervening factors. When using ceteris paribus in economics, one assumes that all other variables except those under immediate consideration are held constant. For example, it can be predicted that if the price of beef increases - ceteris paribus - the quantity of beef demanded by buyers will decrease. In this example, the clause is used to operationally describe everything surrounding the relationship between both the price and the quantity demanded of an ordinary good. This operational description intentionally ignores both known and unknown factors that may also influence the relationship between price and quantity demanded, and thus to assume ceteris paribus is to assume away any interference with the given example. Such factors that would be intentionally ignored include: a change in the price of substitute goods, (e.g., the price of pork or lamb); a change in the level of risk aversion among buyers (e.g., due to an increase in the fear of mad cow disease); and a change in the level of overall demand for a good regardless of its current price (e.g., a societal shift toward vegetarianism). The clause is often loosely translated as "holding all else constant." It does not imply that no other things will in fact change; rather, it isolates the effect of one particular change. Holding all other things constant is directly analogous to using a partial derivative in calculus rather than a total derivative, and to running a regression containing multiple variables rather than just one in order to isolate the individual effect of one of the variables.[16]

[15] (smallbusiness.chron - Wage-Price-Spiral, 2015)
[16] (Wikipedia - Ceteris Paribus, 2015)

The third step in economic research concentrates on the verification or falsification of the model. In natural sciences e.g. this step includes different kinds of experiments to test and evaluate the model by manipulating one or more variables to generate analysable data. But in economics things are different, because performing an experiment usually means to manipulate real world variables. This manipulations may be hazardous and neither scientists nor politicians will take on responsibility for a negative outcome. So economist in general do not have the opportunity to test their models. And another problem still exists in economic research: the lack of principles with universal validity. In natural sciences there are different laws of nature, e.g. gravity, and there is no doubt that gravity is a phenomenon everywhere on the world and everybody can rely on its presence. Models that are developed on laws of nature do have universal validity. Models in economics, developed without any laws of nature, may be valid for many years, but may eventually exceed their use-by date. As a consequence it's difficult in economics to classify a model as "right" or "wrong" because even models classified today as "right" may be "wrong" tomorrow and vice versa.

The most popular model in economics today is the 'market'. What is a market? An actual or nominal place where forces of demand and supply operate, and where buyers and sellers interact (directly or through intermediaries) to trade goods, services, or contracts or instruments, for money or barter. Markets include mechanisms or means for (1) determining price of the traded item, (2) communicating the price information, (3) facilitating deals and transactions, and (4) effecting distribution. The market for a particular item is made up of existing and potential customers who need it and have the ability and willingness to pay for it.[17] For a better understanding of the market-model it's necessary to get some basic insights in how the participants in a market, mainly buyers and sellers, operate. So the next chapters are focusing on buyers' ('demand') and sellers' ('supply') behaviour.

2 Demand

Behind every supply and demand curve is an army of producers and consumers making their own decisions. For consumers, they are driven by their unlimited wants and needs, which do not just motivate mundane activities like eating, drinking, and sleeping, but are ultimately responsible for motivating them to find a job, look for education, run for a political office, explore new worlds, and everything else people do. So demand arises from wants and needs as consumers strive for satisfaction.

All consumers make decisions to maximize their utility.[18] Utility, or usefulness, is the (perceived) ability of something to satisfy needs or wants. Utility is an important concept in economics and game theory, because it represents satisfaction experienced by the consumer of a good. Not coincidentally, a good is something that satisfies human needs or wants and provides utility, for example, to a consumer making a purchase. It was recognized that one cannot directly measure benefit, satisfaction or happiness from a good or service, so instead economists have devised ways of representing and measuring utility in terms of economic choices that can be counted.[19]

Be aware that reality is a little bit more complicated because there are two dimensions of how to achieve benefits from consumption. First there is the 'utilitarian' dimension of a consumption, describing the rational features of a consumption, e.g. the gas mileage of a car. Fulfilling the utilitarian dimension leads to satisfaction. Second there is the 'hedonic' dimension of a consumption, concentrating on the aesthetic and emotional attributes of a consumption, e.g. the colour of a car.

[17] (Business Dictionary - Market, 2015)
[18] (MIT Open Courseware - Preferences and Utility, 2015)
[19] (Wikipedia - Utility, 2015)

Fulfilling the hedonic dimension leads to more than mere satisfaction, perhaps to pleasure and excitement. Whereas this distinction is very important in marketing, leading to the importance of creating a brand and a unique selling proposition, economists do usually not differentiate, mixing up both and call it 'satisfaction'.

But when discussing the determinants of demand it's useful to separate rational and emotional determinants. The most important rational determinants are the price, the income, the price of substitutes, and the price of complements. The most important emotional determinants are tastes (including needs, preferences, habits, etc.) and expectations. The following chapters are focussing on these determinants of demand and how they influence demand.

2.1 Demand and price

The relationship between price and quantity demanded is the starting point for building a model of consumer behaviour. Measuring the relationship between price and quantity demanded provides information which is used to create a demand schedule, from which a demand curve can be derived. Once a demand curve has been created, other determinants can be added to the model. A demand schedule shows the relationship between price and demand over a hypothetical range of prices. For example, a schedule is based on a survey of college students who indicated how many cans of cola they would buy in a week, at various prices.[20]

2.1.1 Law of demand

The law of demand states that other factors being constant (ceteris paribus), price and quantity demand of any good and service are inversely related to each other. When the price of a product increases, the demand for the same product will fall. This relationship is easiest to see when a graph is plotted, the demand curve.

So, reflecting the inverse relationship of price and quantity, demand curves generally have a negative slope. There are at least three accepted explanations of why demand curves slope downwards:

- The law of diminishing marginal utility
- The income effect
- The substitution effect

Diminishing marginal utility: One of the earliest explanations of the inverse relationship between price and quantity demanded is the law of diminishing marginal utility. This law suggests that as more of a product is consumed the marginal (additional) benefit to the consumer falls, hence consumers are prepared to pay less. This can be explained as follows:

Most benefit is generated by the first unit of a good consumed because it satisfies all or a large part of the immediate need or desire. A second unit consumed would generate less utility - perhaps even zero, given that the consumer now has less need or less desire. With less benefit derived, the rational consumer is prepared to pay rather less for the second, and subsequent, units, because the marginal utility falls.

Consider an individual when consuming bars of chocolate. While total utility continues to rise from extra consumption, the additional (marginal) utility from each bar falls. If marginal utility is expressed in a monetary form, the greater the quantity consumed the less the marginal utility and the less value derived - hence the rational consumer would be prepared to pay less for that unit.

The income effect: The income and substitution effect can also be used to explain why the demand curve slopes downwards. If we assume that money income is fixed, the income effect suggests that,

[20] (Economics Online - Demand Theory, 2015)

as the price of a good falls, real income - that is, what consumers can buy with their money income - rises and consumers increase their demand. Therefore, at a lower price, consumers can buy more from the same money income, and, ceteris paribus, demand will rise. Conversely, a rise in price will reduce real income and force consumers to cut back on their demand.

The substitution effect: In addition, as the price of one good falls, it becomes relatively less expensive. Therefore, assuming other alternative products stay at the same price, at lower prices the good appears cheaper, and consumers will switch from the expensive alternative to the relatively cheaper one.

It is important to remember that whenever the price of any resource changes it will trigger both an income and a substitution effect.[21]

What effect does the law of demand have on a company's strategy? If customers prefer low prices, a company will choose the low price strategy, primarily intending to reduce costs as much as possible. That's because with low costs it is easy to agree on a relatively low price to stimulate demand and gain market share. And with a higher market share the production volume increases, enabling economies of scale and thus reducing costs even more. Finally the law of demand explains the tendency to very big units and tendencies of severe cutthroat competition in many industries.

2.1.2 Price elasticity of demand

The price elasticity of demand (commonly known as just price elasticity) measures the rate of response of quantity demanded due to a price change. The formula for the price elasticity of demand (PEoD) is:

PEoD = (% change in quantity demanded) / (% change in price) * (-1)

According to the law of demand the result of dividing the % changes is always negative, because an increasing price (positive % change in price) corresponds with a decreasing quantity (negative % change in quantity demanded), thus resulting in a negative value, and vice versa. For cosmetic reasons most of the economists prefer positive values for PEoD and are therefore multiplying this result with the factor (-1). By calculating PEoD this way a demand is called 'price elastic', i.e. sensitive to price changes, if PEoD > 1. It's called 'unit elastic' if PEoD = 1. And it's called 'price inelastic', i.e. not sensitive to price changes, if PEoD < 1 (but above zero).[22]

The overriding factor in determining PEoD is the willingness and ability of consumers after a price change to postpone immediate consumption decisions concerning the good and to search for substitutes ("wait and look"). A number of factors can thus affect the elasticity of demand for a good:[23]

- Availability of substitute goods: The more and closer the substitutes available, the higher the elasticity is likely to be. As people can easily switch from one good to another if an even minor price change is made, there is a strong substitution effect. If no close substitutes are available, the substitution effect will be small and the demand inelastic.
- Breadth of definition of a good: The broader the definition of a good (or service), the lower the elasticity. For example, Company X's fish and chips would tend to have a relatively high elasticity of demand if a significant number of substitutes are available, whereas food in general would have an extremely low elasticity of demand because no substitutes exist.

[21] (Economics Online - Demand Theory, 2015)
[22] (about.com - Price Elasticity of Demand, 2015)
[23] (Wikipedia - Price Elasticity of Demand, 2015)

- Percentage of income: The higher the percentage of the consumer's income that the product's price represents, the higher the elasticity tends to be. As people will pay more attention when purchasing the good because of its cost, the income effect is substantial. When the goods represent only a negligible portion of the budget the income effect will be insignificant and demand inelastic.
- Necessity: The more necessary a good is, the lower the elasticity, as people will attempt to buy it no matter the price, such as the case of insulin for those who need it.
- Duration: For most goods, the longer a price change holds, the higher the elasticity is likely to be, as more and more consumers find they have the time and inclination to search for substitutes. When fuel prices increase suddenly, for instance, consumers may still fill up their empty tanks in the short run, but when prices remain high over several years, more consumers will reduce their demand for fuel by switching to carpooling or public transportation, investing in vehicles with greater fuel economy or taking other measures. This does not hold for consumer durables such as the cars themselves, however; eventually, it may become necessary for consumers to replace their present cars, so one would expect demand to be less elastic.
- Brand loyalty: An attachment to a certain brand—either out of tradition or because of proprietary barriers—can override sensitivity to price changes, resulting in more inelastic demand.
- Who pays: Where the purchaser does not directly pay for the good they consume, such as with corporate expense accounts, demand is likely to be more inelastic.

2.1.3 Exceptions from the law of demand: Veblen goods

Veblen goods are a possible exception to the general law of demand. These goods are named after the American sociologist, Thorsten Veblen, who, in the early 20th century, identified a 'new' high-spending leisure class. According to Veblen, a rise in the price of high status luxury goods might lead members of this leisure class to increase in their consumption, rather than reduce it. The purchase of such higher priced goods would confer status on the purchaser - a process which Veblen called ‘conspicuous consumption’.[24] By the way: PEoD for Veblen goods is negative.

What is the reason for this kind of consumption? A very popular explanation from social sciences uses Maslow’s hierarchy of needs: Conspicuous consumption meets the need for stable self-respect and self-esteem. Maslow noted two versions of esteem needs: a "lower" version and a "higher" version. The "lower" version of esteem is the need for respect from others. This may include a need for status, recognition, fame, prestige, and attention. The "higher" version manifests itself as the need for self-respect. For example, the person may have a need for strength, competence, mastery, self-confidence, independence, and freedom. This "higher" version takes precedence over the "lower" version because it relies on an inner competence established through experience. Deprivation of these needs may lead to an inferiority complex, weakness, and helplessness.[25] So conspicuous consumption may help people to avoid the negative consequences of deprivation of these needs.

The recommended strategy in selling Veblen goods is the high price strategy. A high price strategy is a marketing strategy whereby a high price is assigned to a product or service by the manufacturers, retailers or producers of service. This is only one type of pricing method or strategy out of a wide variety of methods that can be utilized for the sale of products or services. There are several conditions under which a high price strategy can be assigned to the sale of such items, including for

[24] (Economics Online - Demand Theory, 2015)
[25] (Wikipedia - Maslow's Hierarchy of Needs, 2015)

the uniqueness, the quality, or the rarity of an item.[26] Sometimes consumers take the high price as an indicator for high quality, especially in all those situations in which consumers are not able to judge about the quality because of a lack of knowledge or experience. So a high-priced Veblen good should always hold the promise of being of high quality. Moreover, emotional aspects are important in selling Veblen goods, including a strong brand awareness and rarity.

2.1.4 Exceptions from the law of demand: Giffen goods

Giffen goods are those which are consumed in greater quantities when their price rises, but not being Veblen goods, named after the Scottish economist Sir Robert Giffen.[27] In essence, a Giffen good is a staple food, such as bread or rice, which forms are large percentage of the diet of the poorest sections of a society, and for which there are no close substitutes. From time to time the poor may supplement their diet with higher quality foods, and they may even consume the odd luxury, although their income will be such that they will not be able to save. A rise in the price of such a staple food will not result in a typical substitution effect, given there are no close substitutes. If the real incomes of the poor increase they would tend to reallocate some of this income to luxuries, and if real incomes decrease they would buy more of the staple good, meaning it is an inferior good. Assuming that the money incomes of the poor are constant in the short run, a rise in price of the staple food will reduce real income and lead to an inverse income effect. However, most inferior goods will have substitutes, hence despite the inverse income effect, a rise in price will trigger a substitution effect, and demand will fall. In the case of a Giffen good, this typical response does not happen as there are no substitutes, and the price rise causes demand to increase.

For example, a family living on the equivalent of just $150 a month, may purchase some bread (say 50 loaves at $2 each, which is the minimum they need to survive), and a luxury item at $50. If the price of bread rises by 25% to $2.50 per loaf, continuing to purchase 50 loaves would cost the individual $125, making the luxury unaffordable. They cannot reduce their consumption of bread, given that their current consumption is the minimum they require, and they cannot find a suitable substitute for their stable food. Not being able to afford the luxury would leave the family with an extra $25 to spend, and, given no alternatives to bread, they would purchase 10 more loaves each month. Hence the 25% price increase has resulted in a 20% increase in the demand for bread - from 50 to 60 loaves.[28] By the way: PEoD for Giffen goods is negative, the same as with Veblen goods. But the story behind this result is totally different. Veblen goods are luxury goods whereas Giffen goods are typical for a situation of poverty.

2.1.5 Other exceptions from the law of demand

There are two notable cases of PEoD. The first is when demand is perfectly elastic, i.e. PEoD = ∞. Perfectly elastic demand is represented graphically as a horizontal line (if the vertical axis represents the price and the horizontal axis the quantity demanded of a good). In this case, any increase in price will lead to zero units demanded. This is sometimes the case with goods with a price fixed by law. If e.g. the price for a 10 Euro banknote increases to 11 Euros the demand will decrease to zero.

The second is perfectly inelastic demand. Perfectly inelastic demand is graphed as a vertical line and indicates a PEoD of zero at every point of the curve. This means that the same quantity will be

[26] (wise GEEK - High Price Strategy, 2015)
[27] It was noted by Sir Robert Giffen III that in Ireland during the 19th century there was a rise in the price of bread. The poor people were forced to reduce their consumption of meat and expensive items as eggs etc. Now bread being still the cheapest food, so they started consuming more of it though its price was rising. This phenomenon is often described as "Giffen's Paradox". (Wikipedia - Inferior Goods, 2015)
[28] (Economics Online - Demand Theory, 2015)

demanded regardless of the price, as it is sometimes the case with vitally important medical treatment.[29]

2.2 Demand and income

An Engel curve describes how household expenditure on a particular good or service varies with household income. There are two varieties of Engel Curves.

- Budget share Engel Curves describe how the proportion of household income spent on a good varies with income.
- Alternatively, Engel curves can also describe how real expenditure varies with household income.

They are named after the German statistician Ernst Engel (1821–1896) who was the first to investigate this relationship between goods expenditure and income systematically in 1857. The best-known single result from the article is Engel's law which states that the poorer a family is, the larger the budget share it spends on nourishment.

The shape of Engel curves depend on many demographic variables and other consumer characteristics. A good's Engel curve reflects its income elasticity and indicates whether the good is an inferior, normal, or luxury good. Empirical Engel curves are close to linear for some goods, and highly nonlinear for others. Graphically, the Engel curve is represented in the first-quadrant of the Cartesian coordinate system. Income is shown on the Y-axis and the quantity demanded for the selected good or service is shown on the X-axis.

- For normal goods, the Engel curve has a positive gradient. That is, as income increases, the quantity demanded increases too. Amongst normal goods, there are two possibilities. Although the Engel curve remains upward sloping in both cases, it bends toward the y-axis for necessities and towards the x-axis for luxury goods. Necessity goods are goods that we cannot live without and will not likely cut back on even when times are tough, for example food, power, water and gas. If income increases the proportion of expenditure on these goods falls because of saturation. Luxury goods are not purchased at all below a certain level of income. But if income increases the demand increases too, sometimes at a higher rate than the percentage increase in income, then called ‘superior goods’. So if income increases the proportion of expenditure on luxury goods rises.
- For inferior goods, the situation is a little bit more confusing. Inferiority, in this sense, is an observable fact relating to affordability rather than a statement about the quality of the good. As a rule, these goods are affordable and adequately fulfil their purpose and inferior goods are often associated with lower socio-economic groups. If the income is very low, say near zero, the demanded quantity of inferior goods is very low too and will firstly rise with an increase in income. But further increases in income will not result in further increases in demand: As more costly substitutes that offer more pleasure (or at least variety) become available, the use of the inferior goods diminishes. So the Engel curve has a positive gradient in the beginning (i.e. at very low income) and a negative gradient later on (i.e. at medium or higher income).

Many Engel Curves feature saturation properties in that their slope tends to diminish at high income levels, which suggests that there exists an absolute limit on how much expenditure on a good will rise as household income increases. This saturation property has been linked to slowdowns in the

[29] (Boundless Economics - Interpretations of Price Elasticity of Demand, 2015)

growth of demand for some sectors in the economy, causing major changes in some industries to take place.[30]

2.3 Demand and the price of related goods

When deciding how much of a good they want to purchase, people take into account the prices of both substitute goods and complementary goods. Substitute goods, or substitutes, are goods that are used in place of one another. For example, Coke and Pepsi are substitutes because people tend to, well, substitute one for the other. Complementary goods, or complements, on the other hand, are goods that people tend to use together. DVD players and DVDs are examples of complements, as are computers and high-speed internet access.

The key feature of substitutes and complements is the fact that a change in price of one of the goods has an impact on the demand for the other good. For substitutes, an increase in the price of one of the goods will increase demand for the substitute good. (It's probably not surprising that an increase in the price of Coke would increase the demand for Pepsi as some consumers switch over from Coke to Pepsi.) It's also the case that a decrease in the price of one of the goods will decrease demand for the substitute good.

For complements, an increase in the price of one of the goods will decrease demand for the complementary good. Conversely, a decrease in the price of one of the goods will increase demand for the complementary good. (For example, decreases in the prices of video game consoles serves in part to increase demand for video games.)

Goods that don't have either the substitute or complement relationship are called unrelated goods. In addition, sometimes goods can have both a substitute and a complement relationship to some degree- for example, gasoline is a complement to even fuel-efficient cars, but a fuel-efficient car is a substitute for gasoline to some degree.[31]

2.4 Emotional determinants of demand

Economists call it ‘taste’ when looking for the emotional determinants of demand. Taste include something like desire, wants, fashion, habits and preferences. When tastes rise, so does the quantity demanded. Likewise, when tastes fall, it will depress the quantity demanded. This is what brand advertising is all about. C&A launched a costly marketing campaign to make us think it’s really for fashionable young people what they are selling.

Another important emotional determinant is expectations: When people expect that the value of something will rise, then they demand more of it. This explains the US housing asset bubble of 2005. Housing prices rose, but people bought more because they expected the price to continue to go up. This drove prices even further, until the bubble burst in 2006. Between 2007 and 2011, housing prices fell 30%. However, the quantity demanded didn't really improve. Why? People expected prices to continue falling, thanks to record levels of foreclosures entering the market. Demand didn't improve until people expected future prices would, too.[32] Similarly, people who expect their incomes to increase in the future will often increase their consumption today.[33]

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[30] (Wikipedia - Engel Curve, 2015)
[31] (about.com - Prices of Related Goods as Determinants of Demand, 2015)
[32] (about.com - Five Determinants of Demand, 2015)
[33] (about.com - Expectations as a Determinant of Demand, 2015)

Additionally a broad range of non-economic, basically sociological, factors may have some influence on demand. This includes factors such as the number of children belonging to the family and place of residence, e.g. metropolitan city, semi-urban area, or a village.[34]

2.5 Market demand

Literally a market demand is the total demand within a market, calculated by summing up all individual demands. Of course, all determinants discussed with the individual demand are determinants of market demand too. But there are two remaining factors to be taken into consideration now.

- First of all market demand depends on population size: Demand increases with increase in population and decreases with decrease in population. This is because with the increase (or decrease) in population size, the number of buyers of the product tends to increase (or decrease). Composition of population also affects demand. If composition of population changes, e.g., female population increases, demand for goods meant for women will go up.[35]
- Second, the distribution of income has an influence on market demand: In a society where income is inequitably distributed among people, where there are a few rich and many poor, there will be the maximum demand for luxury goods like cars, costly dresses, holidays in exotic places, etc. In contrast, in a society where income is equitably distributed, there will be maximum demand for necessary goods like food and cheap clothing and very little demand for costly cars, precious metals, jewellery, etc. No doubt the existing pattern of income distribution is a major determinant of aggregate (market) demand and if income is equally distributed, there will in general be more demand. In case of unequal distribution, most people will not have enough money to buy things.[36]

As with the individual demand, the demand curve of market demand shows the relationship between the price of a commodity, as the most important determinant, and its quantity demanded on the assumption that all other variables affecting demand remain constant. However, the term 'quantity demanded' is a narrow term. It refers to a particular point on the curve. Now by looking at a demand curve we can see the effect of a change in price on the quantity demanded. If price rises the quantity demanded of a commodity falls and if price falls its quantity demanded rises, according to the law of demand. The effects of such price changes are shown by movements along the same demand curve from left to right or right to left. Such movements show changes in the quantity demanded of a commodity and are sometimes described as extensions or contractions of demand. If price falls there is a downward movement to the right. This is known as the extension of demand. On the other hand, a contraction of demand refers to an upward movement along the same demand curve from the right to the left in response to a rise in price. If, on the other hand, there is a change in any other factor (except the price of the commodity under consideration) the demand curve will shift to a new position. This implies that at a given price, a larger or a smaller quantity of the commodity will be demanded. This is known as a change in demand. Such a change occurs when there is a change in the income of buyers or in its distribution, or in the prices of related goods (substitutes and compliments), in people's expectations or in non-economic factors. A change in demand is usually referred to as a change in the conditions of demand.[37] For example, in November and December people in many western countries buy more sweets even though prices of these items remain the same, just because it’s Christmas time and it is a habit to consume more sweets then.

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[34] (Mukherjee, 2000, p. 244)
[35] (Ohri, T. R. and Jain, V. K., 2010, p. 61)
[36] (Mukherjee, 2000, p. 245)
[37] (Mukherjee, 2000, p. 246)

So there are two types of changes to be considered when working with demand curves.[38]

1. Type of change: demand
   a) Graphical Representation: Shifts in the demand curve
   b) Cause: Changes in any factor affecting the quantity demanded apart from price.
2. Type of change: quantity demanded
   a) Graphical representation: Movements along the demand curve
   b) Cause: Changes in price, which are in turn caused by changes in costs and supply.

A demand curve shifts towards right because of[39]

- increase in price of substitutes
- decrease in price of complementary goods
- increase in income (normal goods)
- decrease in income (inferior goods)
- increase in population
- tastes in favour of commodity
- expectation of future increase in price

And a demand curve shifts towards left because of

- decrease in price of substitute goods
- increase in price of complementary goods
- decrease in income (normal goods)
- increase in income (inferior goods)
- decrease in population
- tastes not in favour of commodity
- expectation of future decrease in price

3 Supply

3.1 Determinants of supply

Supply is the amount of a good or service that a supplier is willing to provide to the market. Innumerable factors and circumstances could affect a seller's willingness or ability to produce and sell a good. Some of the more common factors are: [40]

- Good's own price: An increase in price will induce an increase in the quantity supplied. This is true for individual supply as well as for market supply. An increase in price will motivate a supplier to extend his business because of, all other factors held constant, increasing profits. Additionally a couple of new suppliers will appear, especially those who couldn't operate without losses in the past, but are now able to sell on a profitable basis. This aspect will be discussed later when analysing the production function.
- Prices of related goods: For purposes of supply analysis, i.e. efficient use of restricted production capacities, related goods refer to goods that can be produced with the firm's existing factors of production. Typically production capacities are used according to profitability, the most profitable products first, followed by the less profitable products. If both the prices of related goods and their profitability increase, production capacities may be

[38] (Wilkinson, 2005, p. 96)
[39] (Chand, 2015)
[40] (Boundless Economics - Determinants of Supply, 2015)

shifted to raise production of these related goods, at the expense of other goods with lesser profitability, thus affecting the quantity supplied.

- Conditions of production: The most significant factor here is the state of technology. If there is a technological advancement related to the production of the good, the supply increases by a shift of the supply curve to the right.
- Expectations: Sellers' expectations concerning future market conditions can directly affect supply.
- Price of inputs: If the price of inputs increases the supply curve will shift left as sellers are less willing or able to sell goods at any given price. Inputs include e.g. land, labour, energy, and raw materials.
- Number of suppliers: As more firms enter the industry the market supply curve will shift out driving down prices. Like with the market demand curve the market supply curve is the horizontal summation of the individual supply curves.
- Total capacity in a market: As existing firms extend capacities the supply increases.
- The suppliers' targets: Firms typically set targets. These are mostly economic targets, such as profit, market share, and risk. Additionally there may be non-economic target too, such as power, prestige, influence, and fighting competitors.
- Government policies and regulations: Governmental intervention can take many forms including environmental and health regulations, hour and wage laws, taxes, electrical and natural gas rates, and zoning and land use regulations. This can have a significant impact on supply decisions.

Evaluating these externalities as well as others not listed, in light of the profit incentive of suppliers, provides insight into the movement of the supply of a good or service to the market. Suppliers will shift production for non-price changes related to the determinants of supply and will slide production levels across the supply curve for price related movements.

3.2 Buyers' and sellers' markets

Economists agree on the overall significant influence of the price of a good or service on the quantity supplied. But most times the price is a given factor which cannot be modified by a single supplier without losing all customers or getting into the red. Without discussing about markets in detail now it is useful to draw a distinction between two different kinds of markets, buyers' and sellers' markets.

A buyer's market is a situation in which purchasers have an advantage over sellers in price negotiations, e.g. when supply exceeds demand. The expression 'buyer's market' is commonly used to describe real estate markets, but it applies to any type of market where there is more product available than there are people who want to buy it. The opposite of a buyer's market is a seller's market, a situation in which sellers have an advantage over buyers in price negotiations, e.g. when demand exceeds supply.

During the housing bubble of the early-to-mid 2000s in the US or in Spain, the real estate market was considered to be a seller's market. Property was in high demand and was likely to sell even if it was overpriced or not in the best condition. In many cases, homes would receive multiple offers and the price would be bid up above the seller's initial asking price. The subsequent housing market crash created a buyer's market in which sellers had to work much harder to generate interest in their properties. Buyers expected homes to be in excellent condition or priced at a discount and could often secure a purchase agreement for less than the seller's asking price for the property.[41]

[41] (Investopedia - Buyer's Market, 2015)

Product pricing is different in buyers and sellers markets. In buyers markets a market price exists ('exogenous'), thus replacing any kind of price calculation by the market-minus approach: Once suppliers have the information about the market price, they work backwards, subtracting a profit margin from the market price and working out how to produce their good at this final target cost. In sellers markets the product pricing follows the cost-plus approach: In the cost-plus approach, company managers look at how much it costs the company to produce a particular product. Once the managers know the cost of the product, they add a profit margin to this amount and offer the product for sale on the market ('endogenous').[42]

3.3 Costs

No matter what kind of market, buyer's or seller's market, a particular supplier is facing in reality: It's important to know about the costs anyway. There are different ways how to structure costs. The most popular and useful way of structuring is in variable vs. fixed costs and in direct vs. indirect costs.

- Variable costs will vary in direct proportion to changes in the level of an activity. For example, direct material, direct labour, sales commissions, fuel cost for a trucking company, and so on, may be expected to increase with each additional unit of output. The activity base is the item or event that causes the incurrence of a variable cost. It is easy to think of the activity base in terms of units produced, but it can be more than that. Activity can relate to labour hours worked, units sold, customers processed, or other such 'cost drivers'. For instance, a dentist uses a new pair of disposable gloves for each patient seen, no matter how many teeth are being filled. Therefore, disposable gloves are variable and key on patient count. But, the material used for fillings is a variable that is tied to the number of decayed teeth that are repaired. Some patients have none, some have one, and others have many. So, each variable cost must be considered independently and with careful attention to what activity drives the cost.[43]
- The opposite of variable costs are fixed costs. Fixed costs do not fluctuate with changes in the level of activity. Assume that a supplier leases a manufacturing facility for assembling. Assume that rent is $1,200,000 no matter the level of production. The rent is said to be a 'fixed' cost, because total rent will not change as output rises and falls. Keep in mind that the fixed cost per unit will decline with increases in production, because this attribute of fixed costs is important to consider in assessing the scalability of a business proposition. There are numerous types of fixed costs. Examples include administrative salaries, rents, property taxes, security, networking infrastructure support, and so forth.[44]
- Direct costs are directly attributable to a cost object, i.e. a product or a service. In construction, the costs of materials, labour, equipment, etc., and all directly involved efforts or expenses for the cost object are direct costs. In manufacturing or other non-construction industries the portion of operating costs that is directly assignable to a specific product or process is a direct cost. Direct costs are those for activities or services that benefit specific projects, for example salaries for project staff and materials required for a particular project. Because these activities are easily traced to projects, their costs are usually charged to projects on an item-by-item basis.[45]
- Indirect costs are not directly attributable to a cost object. Indirect costs are typically allocated to a cost object on some basis. In construction, all costs which are required for completion of the installation, but are not directly attributable to the cost object are indirect,

[42] (James, 2015)
[43] (Walther, L. M. and Skousen, C. J., 2010, pp. 8-9)
[44] (Walther, L. M. and Skousen, C. J., 2010, p. 9)
[45] (Wikipedia - Indirect Costs, 2015)

such as overhead. In manufacturing, costs not directly assignable to the end product or process are indirect. These may be costs for management, insurance, taxes, or maintenance, for example. Indirect costs are those for activities or services that benefit more than one project. Their precise benefits to a specific project are often difficult or impossible to trace. For example, it may be difficult to determine precisely how the activities of the director of an organization benefit a specific project. Indirect costs do not vary substantially within certain production volumes or other indicators of activity, and so they may sometimes be considered to be fixed costs.[46]

It is possible to justify the handling of almost any kind of cost as either direct or indirect. Labour costs, for example, can be indirect, as in the case of maintenance personnel and executive officers; or they can be direct, as in the case of project staff members. Similarly, materials such as miscellaneous supplies purchased in bulk—pencils, pens, paper—are typically handled as indirect costs, while materials required for specific projects are charged as direct costs.[47]

3.4 Production function

In economics production functions are widely used to represent the technological relationship between one or more input factors, e.g. labour and production assets, and the maximum amount of output that can be produced by those inputs. Two different types of production functions are the Cobb-Douglas type and the Leontief type.

- Cobb-Douglas types: A given output can be produced with different combinations of input factors. Whether a supplier employs more labour instead of investing in machinery or v.v. does not matter, because the output can be produced with intensive use of labour and minimal production assets as well as with minimal use of labour and huge production assets. Production functions of Cobb-Douglas type frequently show diminishing marginal returns: Suppose everything is kept constant, except for one single input factor, for instance L, the number of hours worked. An increase in L probably leads to more goods produced. The law of diminishing marginal returns states that the increase in output eventually become smaller and smaller when the number of hours worked is large enough.[48] Consider a factory that employs labourers to produce its product. If all other factors of production remain constant, at some point each additional labourer will provide less output than the previous labourer. At this point, each additional employee provides less and less return. If new employees are constantly added, the plant will eventually become so crowded that additional workers actually decrease the efficiency of the other workers, even decreasing the production of the factory.[49]
- Leontief types: A given output can be produced by using one fixed combination of input factors only, as input factors are not substitutable. If a supplier increases the use of one input factor the remaining input factors must be increased by the same proportion, thus representing a constant marginal return. Production may be increased this way unless hitting a limit in one input factor. Operating a HGV for transportation of goods e.g. needs a driver. With one driver the HGV may run for 8 hours a day, 5 days a week. With two drivers the lorry may run twice the time, operating time generally increases with the number of drivers employed nearly proportionally. But having four drivers and employing another one will not increase operating time because the HGV reached its capacity limit of 24/7.

[46] (Wikipedia - Indirect Costs, 2015)
[47] (Wikipedia - Indirect Costs, 2015)
[48] (Ahlersten, 2008, p. 58)
[49] (Investopedia - Law of Diminishing Marginal Returns, 2015)

When calculating the return of a business it's easy to show that maximum profit arises at the capacity limit if production follows the Leontief type of production function. But when production follows a Cobb-Douglas type of production function, the maximum profit is achieved before reaching a limit. A Cobb-Douglas producer may have the technical option to increase business, i.e. there is still some capacity free, but from the economical point of view it is not useful to do so. Any additional production will lead to additional costs that exceeds the additional turnover, so profit will decrease.

3.5 Supply curve

A supply curve is a graphical representation of a supply schedule. It shows the relationship between price and quantity supplied during a particular period, all other things unchanged. The relationship between price and quantity supplied is generally positive, supply curves are generally upward sloping. This may easiest be explained (with simple mathematics only) by calculating the profit using the supplier's production function: Any supplier with a given set of equipment, a fixed capacity and a given cost structure needs a minimum price to make profit. Under the assumption that a supplier does not produce if the market price is below this minimum price, this supplier's individual supply curve appears as a step function with one step only: The produced quantity is zero if the market price is below the minimum price. The produced quantity meets the maximum quantity if the market price is above the minimum price. The maximum quantity itself depends on the type of production function. In case of a Leontief type the maximum quantity equals the quantity when reaching the capacity limit. In case of a Cobb-Douglas type the maximum quantity equals the profit-maximising quantity. It is important to note that a supplier produces zero or the maximum quantity only: If production is profitable, why not produce the maximum quantity to achieve maximum profit? Any lower quantity will lead to a lower profit. And if production is not profitable, why to produce at all, just to increase losses?[50]

The market supply curve is achieved by horizontally summing up the individual supply curves of all suppliers within a market. Usually every supplier is facing an individual cost structure, an individual minimum price, and an individual maximum quantity. So every supplier has an individual step function. Summing up these step functions (each with one step only) results in a market step function with many steps, perhaps with as many steps as there are suppliers in a market. With a very low market price no supplier is producing. A higher price makes production profitable for the cost-leader first, followed by the less cost-efficient suppliers. The higher the price is, the more suppliers start producing and selling, thus leading to an increase in market supply. As a result, the market supply curve is a step function with an upward slope, commonly approximated by a linear function with positive gradient.

In general two exceptions from the supply curve with upward slope are possible:

- Sometimes suppliers are trying to sell without any regard on the price, e.g. with a closing sale, resulting in a vertical supply curve.
- Sometimes there is one, mostly legally fixed, price for a product or service only, e.g. the price for a 10 Euro banknote equals exactly 10 Euros, resulting in a horizontal supply curve.

A change in price causes a movement along the supply curve; such a movement is called a change in quantity supplied. As is the case with a change in quantity demanded, a change in quantity supplied

[50] In real business life suppliers sometimes continue to produce, even if production is not profitable, for different reasons, maybe e.g. expecting a future price increase or for keeping up a line of products with cross-subsidisation.

does not shift the supply curve. But a change in any other determinant of supply results in a shift, of course.[51]

4 Market

The 'market' is the prevailing model to describe and explain economic reality. As usual with many economic models this approach is simplifying to a high degree and, additionally, depending on a vast bunch of assumptions and limitations. The market model frequently flops when trying to explain a specific economic situation in detail. But if the focus is on a more general understanding of the economic reality instead, it gives basic, but nevertheless useful, insights. It's important to keep in mind its implications and limits when adapting the model to economic reality: One major aspect of the market model is overall ('perfect') competition. Suppliers compete with each other, buyers compete with each other. But in economic reality competition is often restricted, sometimes even not existing. And in many cases our economic system is based not on competing 'agents' but on negotiations or other ways of co-ordination instead.

The first who spread the idea of the 'market' in literature was Adam Smith, the father of modern economics, in his 1776 book "An Inquiry into the Nature and Causes of the Wealth of Nations". He introduced the term to describe a system of how supply meets demand in a more or less free and unregulated surrounding. And, most important, he demonstrates that a free market is beneficial for the society on the whole.

> *The produce of industry is what it adds to the subject or materials upon which it is employed. In proportion as the value of this produce is great or small, so will likewise be the profits of the employer. But it is only for the sake of profit that any man employs a capital in the support of industry; and he will always, therefore, endeavour to employ it in the support of that industry of which the produce is likely to be of the greatest value, or to exchange for the greatest quantity either of money or of other goods.*
>
> *But the annual revenue of every society is always precisely equal to the exchangeable value of the whole annual produce of its industry, or rather is precisely the same thing with that exchangeable value. As every individual, therefore, endeavours as much as he can, both to employ his capital in the support of domestic industry, and so to direct that industry that its produce maybe of the greatest value; every individual necessarily labours to render the annual revenue of the society as great as he can. He generally, indeed, neither intends to promote the public interest, nor knows how much he is promoting it. By preferring the support of domestic to that of foreign industry, he intends only his own security; and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain; and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for the society that it was no part of it. By pursuing his own interest, he frequently promotes that of the society more effectually than when he really intends to promote it. I have never known much good done by those who affected to trade for the public good.*[52]

[51] (Rittenberg, L. and Tregarthen, T., Chapter 3.2, 2009)
[52] (Smith, 1776, p. 293)

The theory for the “invisible hand” states that if each consumer is allowed to choose freely what to buy and each producer is allowed to choose freely what to sell and how to produce it, the market will settle on a product distribution and prices that are beneficial to all the individual members of a community, and hence to the community as a whole. The reason for this is that self-interest drives actors to beneficial behaviour in a case of serendipity. Efficient methods of production are adopted to maximize profits. Low prices are charged to maximize revenue through gain in market share by undercutting competitors. Investors invest in those industries most urgently needed to maximize returns, and withdraw capital from those less efficient in creating value. All these effects take place dynamically and automatically. The idea of trade and market exchange automatically channelling self-interest toward socially desirable ends is a central justification for the laissez-faire economic philosophy, which lies behind neoclassical economics.[53]

4.1 Equilibrium

As seen in the chapters before, consumers and producers react differently to price changes. [54] Typically, higher prices tend to reduce demand while encouraging supply, and lower prices increase demand while discouraging supply.

Economic theory suggests that, in a free market there will be a single price which brings demand and supply into balance, called equilibrium price. Both parties require the scarce resource that the other has and hence there is a considerable incentive to engage in an exchange.

In its simplest form, the constant interaction of buyers and sellers enables a price to emerge over time. It is often difficult to appreciate this process because the retail prices of most manufactured goods are set by the seller. The buyer either accepts the price or does not make the purchase. While an individual consumer in a shopping mall might bargain over the price, this is unlikely to work, and they will believe they have no influence over price. However, if all potential buyers bargained, and none accepted the set price, then the seller would be quick to reduce price. In this way, collectively, buyers have influence over market price. Eventually a price is found which enables an exchange to take place. A rational seller would take this a step further, and gather as much market information as possible in an attempt to set a price which achieves a given number of sales at the outset. For markets to work, an effective flow of information between buyer and seller is essential.

The equilibrium price is also called market clearing price because at this price the exact quantity that producers take to market will be bought by consumers, and there will be nothing ‘left over’. This is efficient because there is neither an excess of supply and wasted output, nor a shortage – the market clears efficiently. This is a central feature of the price mechanism, and one of its significant benefits.

Imagine, the price is higher than the equilibrium price. At a price higher than equilibrium, demand will be less, but supply will be more and there will be an excess of supply in the short run. By the way, it’s important to restrict these arguments to the short run, because on the long run every supplier will be able to adapt to a new situation in the market by adjusting production capacities. Facing this excess, suppliers will compete with each other by reducing the price, thus moving downwards on their supply curve. At the same time demand will increase because of the inverse relationship between price and demand, showing a downward movement on the demand curve. This price development will continue until the price reaches the equilibrium price, matching supply and demand again.

And now imagine, the price is lesser than the equilibrium price. Demand will be higher, but supply will be less and there will be an excess of demand in the short run, causing the buyers to compete

[53] (Wikipedia - Invisible Hand, 2015)
[54] (Economics Online - Equilibrium, 2015)

with each other. This competition will enable suppliers to sell their rare goods at a higher price, hence attracting additional suppliers. An increase in price leads to an increase in supply and a decrease in demand or, in other words, a downward movement on the supply and demand curve at a time. It's always the same: This price development will continue until, again, the price reaches the equilibrium price where supply and demand are matching.

Every economist knows about the shortcomings of this more or less ideal conception of how an economy works, no doubt. But the model of the market as a means of explanation should be understood as a first step to a deeper understanding. Surprisingly, sometimes this simple model describes reality quite precise, e.g. when analysing trading at a stock exchange: In the case of excess supply, sellers will be left holding excess stocks, price will adjust downwards and supply will be reduced (because some sellers do not agree on a lower price). In the case of excess demand, sellers will quickly run down their stocks, which will trigger a rise in price and increased supply. The more efficiently the market works, the quicker it will readjust to create a stable equilibrium price. Changes in demand and supply in response to changes in price are referred to as the signalling and incentive effects of price changes.

The equilibrium price should not be understood as a commonly agreed price.[55] Of course, there will be some customers who can't afford to buy because the equilibrium price is too high. And, of course, there will be some suppliers who are not able to achieve any profit because the equilibrium price is too low. But there are some customers who fully agree with the equilibrium price as they actually pay less than they are prepared to pay, deriving a consumer surplus. And, additionally, there are some suppliers who realise a producer surplus: A producer surplus is the additional private benefit to producers, in terms of profit, gained when the price they receive in the market is more than the minimum they would be prepared to supply for. In other words they receive a reward that more than covers their costs of production. Community surplus, also called economic welfare, can be calculated by adding consumer and producer surplus at equilibrium. Economic welfare is likely to be maximised in perfectly competitive markets with no externalities and no government interventions. Achieving maximum economic welfare doesn't necessarily mean that the welfare is distributed equally or fairly, it simply means that consumer plus producer welfare is at its highest possible amount. Deadweight loss is something that occurs in an economy when economic welfare is not maximized.

4.2 Market structure

4.2.1 Perfect competition

A perfectly competitive market is a hypothetical market where competition is at its greatest possible level. Perfectly competitive markets exhibit the following characteristics:

- There is perfect knowledge, with no information failure or time lags. Knowledge is freely available to all participants, which means that risk-taking is minimal and the role of the entrepreneur is limited.
- There are no barriers to entry into or exit out of the market.
- Firms produce homogeneous, identical, units of output that are not branded.
- Each unit of input, such as units of labour, are also homogeneous.
- No single firm can influence the market price, or market conditions. The single firm is said to be a price taker, taking its price from the whole industry.
- There are a very large numbers of firms in the market.
- There is no need for government regulation, except to make markets more competitive.
- There are assumed to be no externalities, which is no external costs or benefits.

[55] (Economics Online - Consumer and Producer Surplus, 2015)

- Firms can only make normal profits in the long run, but they can make abnormal profits in the short run.

The single firm takes its price from the industry, and is, consequently, referred to as a price taker. The industry is composed of all firms in the industry and the market price is where market demand is equal to market supply. Each single firm must charge this price and cannot diverge from it.

Under perfect competition, firms can make super-normal profits or losses in the short run. However, in the long run firms are attracted into the industry if the incumbent firms are making supernormal profits. This is because there are no barriers to entry and because there is perfect knowledge. Moreover, any supplier in the industry, achieving high profits, tries to further increase profits by expanding production capacity. And suppliers in the industry that are not making profits right now will imitate the cost leader, practising a strategy called 'benchmarking' in modern management science, to achieve profits in the future. The effect of these developments is to shift the industry supply curve to the right, which drives down the price until the point where all super-normal profits are exhausted. [56]

Adam Smith called the minimum price in an industry the 'natural price':

> *When the price of any commodity is neither more nor less than what is sufficient to pay the rent of the land, the wages of the labour, and the profits of the stock employed in raising, preparing, and bringing it to market, according to their natural rates, the commodity is then sold for what may be called its natural price.*[57]

So the natural price is the price for a good or service that is equal to the cost of production.

> *The natural price, therefore, is, as it were, the central price, to which the prices of all commodities are continually gravitating. Different accidents may sometimes keep them suspended a good deal above it, and sometimes force them down even somewhat below it. But whatever may be the obstacles which hinder them from settling in this centre of repose and continuance, they are constantly tending towards it.*[58]

If the natural price is the market price for a good or a service, nobody in the industry has the opportunity to achieve super-normal profits. Moreover, a single supplier will face losses and therefore disappear from the market, if not imitating the cost leader. So every supplier in the industry faces an identical cost structure, leading not only to a rightward shift of the supply curve, but also to a supply curve with nearly no slope.

But, following the general assumptions of the market model, suppliers are supposed to maximise their profits, so they may strive for any idea to improve their financial situation. Innovation could be a means to an end: An innovative supplier may eventually have an idea on how to achieve super-normal profits by technical innovation, a new design, new material supply, improvements in distribution etc. This innovative supplier differentiates from all competitors, establishing a kind of monopoly. But this monopoly is limited, because now the process of attracting new firms, expanding production capacities, and benchmarking starts again, and after a certain time every firm in the

[56] (Economics Online - Perfect Competition, 2015)
[57] (Smith, 1776, p. 36)
[58] (Smith, 1776, p. 38)

industry has adapted to the innovation. The supply curve, represented by a nearly horizontal line, will shift downwards, resulting in an again decreasing market price and a higher quantity demanded.

If firms are making losses, they will leave the market as there are no exit barriers, and this will shift the industry supply to the left, which raises price and enables those left in the market to derive normal profits.[59]

It can be argued that perfect competition yields a lot of benefits. First of all perfect competition keeps markets free from monopoly power. As only normal profits are made, producers just cover their production costs and prices are as low as possible. This results in a consumer surplus and increasing economic welfare. Moreover there is maximum allocative and productive efficiency: Only the most effective firms are able to survive in the minefield of perfect competition. So neoclassical economists argue that perfect competition would produce the best possible outcomes for consumers and society.

But how realistic is the model? As a matter of fact, only very few markets or industries in the real world are perfectly competitive. E.g., many primary and commodity markets, such as coffee and tea, exhibit many of the characteristics of perfect competition, such as the number of individual producers that exist, and their inability to influence market price. But for nearly every market in manufacturing and services, the model is not working, showing a lack of one or more characteristics of perfect competition. But nevertheless this model represents a useful yardstick by which economists and regulators can evaluate levels of competition that exist in real markets.[60]

4.2.2 Oligopoly

An oligopoly is a market structure in which a few firms and/or a few customers dominate.[61] When a market is shared between a few firms, it is said to be highly concentrated. Although only a few firms dominate, it is possible that many small firms may also operate in this market. For example, major airlines like British Airways (BA) and Air France operate their routes with only a few close competitors, but there are also many small airlines catering for the holidaymaker or offering specialist services. Oligopolies may be identified using concentration ratios, which measure the proportion of total market share controlled by a given number of firms. When there is a high concentration ratio in an industry, economists tend to identify the industry as an oligopoly.[62]

4.2.2.1 Characteristics

The main characteristics of firms operating in a market with few close rivals include:[63]

- Interdependence: Firms that are interdependent cannot act independently of each other. A firm operating in a market with just a few competitors must take the potential reaction of its closest rivals into account when making its own decisions. For example, if a petrol retailer like Texaco wishes to increase its market share by reducing price, it must take into account the possibility that close rivals, such as Shell and BP, may reduce their price in retaliation. An understanding of game theory and the Prisoner's Dilemma helps appreciate the concept of interdependence.
- Strategy: Strategy is extremely important to firms that are interdependent. Because firms cannot act independently, they must anticipate the likely response of a rival to any given

[59] (Economics Online - Perfect Competition, 2015)
[60] (Economics Online - Perfect Competition, 2015)
[61] For ease of understanding and simplification the following text identifies an oligopoly as a market with a few firms and many (potential) buyers.
[62] (Economics Online - Oligopoly, 2015)
[63] (Economics Online - Oligopoly, 2015)

change in their price, or their non-price activity. In other words, they need to plan, and work out a range of possible options based on how they think rivals might react. Oligopolists have to make critical strategic decisions, such as:

- Whether to compete with rivals, or collude with them.
- Whether to raise or lower price, or keep price constant.
- Whether to be the first firm to implement a new strategy, or whether to wait and see what rivals do. The advantages of 'going first' or 'going second' are respectively called 1st and 2nd mover advantage. Sometimes it pays to go first because a firm can generate head-start profits. 2nd mover advantage occurs when it pays to wait and see what new strategies are launched by rivals, and then try to improve on them or find ways to undermine them.[64]

- Barriers to entry: Oligopolies and monopolies frequently maintain their position of dominance in a market because it might be too costly or difficult for potential rivals to enter the market. These hurdles are called barriers to entry and the incumbent can erect them deliberately, or they can exploit natural barriers that exist.

  Natural barriers include:

  - Economies of large scale production: If a market has significant economies of scale that have already been exploited by the incumbents, new entrants are deterred.
  - Ownership or control of a key scarce resource: Owning scarce resources that other firms would like to use creates a considerable barrier to entry, such as an airline controlling access to an airport.
  - High set-up costs: High set-up costs deter initial market entry, because they increase break-even output, and delay the possibility of making profits. Many of these costs are sunk costs, which are costs that cannot be recovered when a firm leaves a market, and include marketing and advertising costs and other fixed costs.
  - High R&D costs: Spending money on Research and Development (R & D) is often a signal to potential entrants that the firm has large financial reserves. In order to compete, new entrants will have to match, or exceed, this level of spending in order to compete in the future. This deters entry, and is widely found in oligopolistic markets such as pharmaceuticals and the chemical industry.

  Artificial barriers include:

  - Predatory pricing: Predatory pricing occurs when a firm deliberately tries to push prices low enough to force rivals out of the market.
  - Limit pricing: Limit pricing means the incumbent firm sets a low price and a high output, so that entrants cannot make a profit at that price. This is best achieved by selling at a price just below the average total costs (ATC) of potential entrants. This signals to potential entrants that profits are impossible to make.
  - Superior knowledge: An incumbent may, over time, have built up a superior level of knowledge of the market, its customers, and its production costs. This superior knowledge can deter entrants into the market.
  - Predatory acquisition: Predatory acquisition involves taking-over a potential rival by purchasing sufficient shares to gain a controlling interest, or by a complete buy-out. As with other deliberate barriers, regulators, like the Competition Commission, may prevent this because it is likely to reduce competition.
  - Advertising: Advertising is another sunk cost - the more that is spent by incumbent firms the greater the deterrent to new entrants.

[64] A common saying is: „The early bird catches the worm", representing the 1st mover advantage. By integrating the 2nd mover advantage into this saying it may be extended by: "And the late cat is well fed by the bird."

- A strong brand: A strong brand creates loyalty, 'locks in' existing customers, and deters entry.
- Loyalty schemes: Schemes such as club cards, offering significant benefits to their holders, help oligopolists retain customer loyalty and deter entrants who need to gain market share.
- Exclusive contracts, patents and licences: These make entry difficult as they favour existing firms who have won the contracts or own the licenses. For example, contracts between suppliers and retailers can exclude other retailers from entering the market.
- Vertical integration: Vertical integration can 'tie up' the supply chain and make life tough for potential entrants, such as an electronics manufacturer like Sony having its own retail outlets (Sony Centres), and a brewer like InBev operating its own pubs in Germany.

4.2.2.2 Collusion

Another key feature of oligopolistic markets is that firms may attempt to collude, rather than compete. If colluding, participants act like a monopoly and can enjoy the benefits of higher profits over the long term. 'Overt collusion' occurs when there is no attempt to hide agreements, e.g. when firms form trade associations like the Association of Petrol Retailers. 'Covert collusion' occurs when firms try to hide the results of their collusion, usually to avoid detection by regulators, such as when fixing prices. 'Tacit collusion' arises when firms act together, called acting in concert, but where there is no formal or even informal agreement. For example, it may be accepted that a particular firm is the price leader in an industry, and other firms simply follow the lead of this firm. All firms may 'understand' this, but no agreement or record exists to prove it. If firms do collude, and their behaviour can be proven to result in reduced competition, they are likely to be subject to regulation. In many cases, tacit collusion is difficult or impossible to prove, though regulators are becoming increasingly sophisticated in developing new methods of detection.[65]

4.2.2.3 Pricing

Sometimes oligopolists decide not to collude but to compete instead. Different strategies may be pursued:[66]

- Oligopolists may use predatory pricing to force rivals out of the market. This means keeping price artificially low, and often below the full cost of production.
- They may also operate a limit-pricing strategy to deter entrants, which is also called entry forestalling price.
- Oligopolists may collude with rivals and raise price together, but this may attract new entrants.

When calculating a price, cost plus pricing is frequently used by oligopolists. Cost-plus pricing is a straightforward pricing method, where a firm sets a price by calculating average production costs and then adding a fixed mark-up to achieve a desired profit level. Cost-plus pricing is also called rule of thumb pricing. There are different versions of cost-plus pricing, including full cost pricing, where all costs - that is, fixed and variable costs - are calculated, plus a mark-up for profits, and contribution pricing, where only variable costs are calculated with precision and the mark-up is a contribution to both fixed costs and profits. Cost-plus pricing is very useful for firms that produce a number of different products, or where uncertainty exists. It has been suggested that cost-plus pricing is common because a precise calculation of marginal cost and marginal revenue is difficult for many

[65] (Economics Online - Oligopoly, 2015)
[66] (Economics Online - Oligopoly, 2015)

oligopolists. Hence, it can be regarded as a response to information failure. Cost-plus pricing is also common in oligopoly markets because it is likely that the few firms that dominate may often share similar costs, as in the case of petrol retailers. However, there is a risk with such a rigid pricing strategy as rivals could adopt a more flexible discounting strategy to gain market share.

Cost-plus pricing can also be explained through the application of game theory. If one firm uses cost-plus pricing - perhaps the dominant firm with the greatest market share - others may follow suit so that the strategy becomes a shared one, which acts as a pricing rule. This takes some of the risk out of pricing decisions, given that all firms will abide by the rule. This could be considered a form of tacit collusion.

4.2.2.4 Non-price competition

To avoid destructive price wars, competing oligopolists typically prefer non-price competition:[67] A price reduction may achieve strategic benefits, such as gaining market share, or deterring entry, but the danger is that rivals will simply reduce their prices in response. Finally this leads to little or no gain, but can lead to falling revenues and profits. Hence, a far more beneficial strategy may be to undertake non-price competition, including e.g.:

- Trying to improve quality and after sales servicing, such as offering extended guarantees.
- Spending on advertising, sponsorship and product placement - also called hidden advertising – is very significant to many oligopolists. The German football Bundesliga has long been sponsored by firms in oligopolies, including Volkswagen (VfL Wolfsburg), Telekom (Bayern München), and Deutsche Bahn (Hertha BSC).
- Sales promotion, such as buy-one-get-one-free (BOGOF) or special discounts, is e.g. associated with fast food chains, which is a highly oligopolistic market, dominated by a couple of large chains like McDonalds, Burger King, and KFC.
- Loyalty schemes, which are common in the retail sector, such as 'IKEA family' and 'Görtz Card', and in nearly every oligopolistic sector of an economy, e.g. 'AVIS preferred' when hiring cars.

Each strategy can be evaluated in terms of:

- How successful is it likely to be?
- Will rivals be able to copy the strategy?
- Will the firms get a 1st or 2nd - mover advantage?
- How expensive is it to introduce the strategy? If the cost of implementation is greater than the pay-off, clearly it will be rejected.
- How long will it take to work? A strategy that takes five years to generate a pay-off may be rejected in favour of a strategy with a quicker pay-off.

4.2.2.5 Price stickiness and kinked demand curve

The law of demand, introduced in previous chapters, states an inverse relationship between price and demand. This is in general valid for oligopolies too, but when having a look on the elasticity of demand, the situation in oligopolies differs from perfect competition. The theory of oligopoly suggests that, once a price has been determined, it will stick at this price. This is largely because firms cannot pursue independent strategies. For example, if an airline raises the price of its tickets from London to New York, rivals will not follow suit and the airline will lose revenue - the demand curve for the price increase is relatively elastic. Rivals have no need to follow suit because it is to their competitive advantage to keep their prices as they are. However, if the airline lowers its price, rivals

[67] (Economics Online - Oligopoly, 2015)

would be forced to follow suit and drop their prices in response. Again, the airline will lose sales revenue and market share. The demand curve is relatively inelastic in this context.

So the reaction of rivals to a price change depends on whether the price is raised or lowered. The elasticity of demand, and hence the gradient of the demand curve, will also be different. The demand curve will be kinked at the current price. Even when there is a large rise in marginal cost, price tends to stick close to its original, given the high price elasticity of demand for any price rise.

Pricing strategies can also be looked at in terms of game theory; that is in terms of strategies and payoffs. There are three possible price strategies, with different pay-offs and risks:

- to raise the price
- to lower the price
- to keep the price constant

The choice of strategy will depend upon the pay-offs, which depends upon the actions of competitors. Raising price or lowering price could lead to a beneficial pay-off, but both strategies can lead to losses, which could be potentially disastrous. In short, changing price is too risky to undertake. Therefore, although keeping price constant will not lead to the single best outcome, it may be the least risky strategy for an oligopolist.[68]

4.2.2.6 Prisoners' dilemma

Game theory also predicts that there is a tendency for cartels to form because co-operation is likely to be highly rewarding.[69] Co-operation reduces the uncertainty associated with the mutual interdependence of rivals in an oligopolistic market. While cartels are 'unlawful' in most countries, they may still operate, with members concealing their unlawful behaviour.

A situation called the Prisoners' Dilemma is often used to demonstrate the interdependence of oligopolists:[70]

Two members of a criminal gang, Thelma and Louise, are arrested and imprisoned. Each prisoner is in solitary confinement with no means of speaking to or exchanging messages with the other. The police admit they don't have enough evidence to convict the pair on the principal charge, but they may be sentenced both to 2 years in prison on a lesser charge, even without any confession. Simultaneously, the police offer each prisoner a deal: Each prisoner is given the opportunity to betray the other, by testifying that the other committed the crime. A whistle-blower will receive protection and will be rewarded by a lesser sentence. So Thelma and Louise face this situation:

- Thelma testifies and Louise remains silent: Thelma will serve 1 year, Louise the maximum sentence of 15 years in prison. They both together will receive 16 years.
- Thelma and Louise both testify: Both will serve 10 years, the reduced sentence for co-operating with the police, in prison each, receiving 20 years together.
- Thelma remains silent and Louise testifies: Thelma will serve 15 years, Louise 1 year in prison. They both together will receive 16 years.
- Thelma and Louise both remain silent: Both will serve 2 years in prison each, receiving 4 years together.

[68] (Economics Online - Oligopoly, 2015)
[69] (Economics Online - Oligopoly, 2015), (Investopedia - Prisoner's Dilemma, 2015)
[70] (Wikipedia - Prisoner's Dilemma, 2015)

Obviously, the best strategy for both together is to remain silent, because of a minimum sentence for both of them (4 years). But let's have a look on what Thelma is expecting:

- If she remains silent, she will receive a 15-year (Louise testifies) or 2-year (Louise remains silent too) sentence.
- If she testifies, she will receive a 10-year (Louise testifies too) or 1-year (Louise remains silent) sentence.

Thelma's sentence depends on what Louise is doing. If Louise testifies, Thelma is better off testifying too, receiving 10 instead of 15 years. If Louise remains silent, Thelma is again better off testifying too, receiving 1 instead of 2 years. So it is in Thelma's best interest to testify.

Let's have a look on what Louise is expecting:

- If she remains silent, she will receive a 15-year (Thelma testifies) or 2-year (Thelma remains silent too) sentence.
- If she testifies, she will receive a 10-year (Thelma testifies too) or 1-year (Thelma remains silent) sentence.

Louise's sentence depends on what Thelma is doing. If Thelma testifies, Louise is better off testifying too, receiving 10 instead of 15 years. If Thelma remains silent, Louise is again better off testifying too, receiving 1 instead of 2 years. So it is in Louise's best interest to testify.

It is implied that the prisoners will have no opportunity to reward or punish their partner other than the prison sentences they get, and that their decision will not affect their reputation in the future. As a result they testify both, receiving a 10-year sentence each, thus facing the worst of all possible outcomes. But why are they not improving their situation? It's simply because there is no co-operation, no communication, and no trust. Purely rational prisoners will always testify, betraying each other. And that's the implication for oligopolies: Every oligopolist will act purely rational and pursuing individual reward logically leads them to betray, when they would get a better reward as with co-operation.

There is a tendency for cartels to form because co-operation, communication, and trust is likely to be highly rewarding. Co-operation reduces the uncertainty associated with the mutual interdependence of rivals in an oligopolistic market. Cartels typically agree on a total quantity produced and on a standard price, both calculated in a way to maximise the cartel's profit. Every member of the cartel gets a share in the market by producing a fixed, assigned quantity. There may be incentives for every member of the cartel to break the rules and to produce more than the assigned quantity. This will lead to a certain downward movement of the price, a decrease in the cartel's profit, a higher profit for the rule-breaker and lower profits for the remaining members of the cartel who strictly produce the assigned quantities only. Of course, a cartel will try to 'convince' rule-breakers to return to their assigned quantities anyway.

While cartels are 'unlawful' in most countries, they may still operate, with members concealing their unlawful behaviour. Cartels are designed to protect the interests of members, and the interests of consumers may suffer because of

- higher prices or hidden prices, such as the hidden charges in credit card transactions,
- lower output,
- and restricted choice or other limiting conditions associated with the transaction.

Oligopolies are common in the airline industry, banking, brewing, discount stores and music. For example, the manufacture, distribution and publication of music products in the EU is highly concentrated, with the three major labels Sony, Warner and Universal.

4.2.2.7 Evaluation of oligopolies

Oligopolies are significant because they generate a considerable share of national income in all western countries, dominating many sectors of the economy.[71] Oligopolies can be criticised on a number of obvious grounds, including:

- High concentration reduces consumer choice.
- Cartel-like behaviour reduces competition and can lead to higher prices and reduced output.
- Firms can be prevented from entering a market because of deliberate barriers to entry.
- There is a potential loss of economic welfare.
- Oligopolists may be inefficient because of reduced competition and missing market forces.

However, oligopolies may provide the following benefits:

- Oligopolies may adopt a highly competitive strategy, in which case they can generate similar benefits to more competitive market structures, such as lower prices. Even though there are a few firms, making the market uncompetitive, their behaviour may be highly competitive.
- Oligopolists may be dynamically efficient in terms of innovation and new product and process development. The super-normal profits they generate may be used to innovate, in which case the consumer may gain.
- Price stability may bring advantages to consumers and the macro-economy because it helps consumers plan ahead and stabilises their expenditure, which may help stabilise the trade cycle.

4.2.3 Monopoly

A ‘pure’ monopoly exists when a specific person or enterprise is the only supplier of a particular commodity.[72] This contrasts with a monopsony which relates to a single entity's control of a market to purchase a good or service, and with oligopoly which consists of a few entities dominating an industry. Monopolies are thus characterized by a lack of economic competition to produce the good or service and, as a consequence, a lack of viable substitute goods. The absence of substitutes is crucial, as it makes the demand for the good relatively inelastic enabling monopolies to extract positive profits.

4.2.3.1 Barriers to entry

Monopolies derive their market power from barriers to entry – circumstances that prevent or greatly impede a potential competitor's ability to compete in a market. There are four major types of barriers to entry: economic, social, legal and deliberate. [73]

Economic barriers include economies of scale, capital requirements, cost advantages and technological superiority.

- Economies of scale: Monopolies are characterised by decreasing costs for a relatively large range of production. Decreasing costs coupled with large initial costs give monopolies an advantage over would-be competitors. Monopolies are often in a position to reduce prices below a new entrant's operating costs and thereby prevent them from continuing to

[71] (Economics Online - Oligopoly, 2015)
[72] (Wikipedia - Monopoly, 2015)
[73] (Wikipedia - Monopoly, 2015)

compete. Furthermore, the size of the industry relative to the minimum efficient scale may limit the number of companies that can effectively compete within the industry. If for example the industry is large enough to support one company of minimum efficient scale (MES) then other companies entering the industry will operate at a size that is less than MES, meaning that these companies cannot produce at an average cost that is competitive with the dominant company. Finally, if long-term average cost is constantly decreasing according to an experience curve, the least cost method to provide a good or service is by a single company.

- Capital requirements: Production processes that require large investments of capital limit the number of companies in an industry. This is the same when newcomers are facing large research and development costs or substantial sunk costs. Large fixed costs also make it difficult for a small company to enter an industry and expand.
- Technological superiority: A monopoly may be better able to acquire, integrate and use the best possible technology in producing its goods while entrants do not have the size or finances to use the best available technology. One large company can sometimes produce goods cheaper than several small companies.

Social barriers are based on network effects. A network effect describes the direct relationship between the proportion of people using a product and the demand for that product. In other words, the more people who are using a product the greater the probability of any individual starting to use the product. So the use of a product by a person can affect the value of that product to other people. This effect accounts for temporary fashion trends, social networks etc. It also can play a crucial role in the development or acquisition of market power. The most famous current example is the market dominance of the Microsoft Office suite and Windows operating system in personal computers.

Legal barriers: Legal rights can provide opportunity to monopolise the market of a good. Intellectual property rights, including patents and copyrights, give a monopolist exclusive control of the production and selling of certain goods. Property rights may give a company exclusive control of the materials necessary to produce a good. An example for a long lasting monopoly based on a legal barrier is the post service in Germany which existed until end of 2007.

Deliberate actions: A company wanting to monopolise a market may engage in various types of deliberate action to exclude competitors or eliminate competition. Such actions include collusion, lobbying governmental authorities, and force.

4.2.3.2 Natural monopoly

Another important source of monopoly power is the control of resources that are critical to the production of a final good.[74] A natural monopoly is a distinct type of monopoly that may arise when there are extremely high fixed costs of distribution, such as exist when large-scale infrastructure is required to ensure supply. Examples of infrastructure include cables and grids for electricity supply, pipelines for gas and water supply, and networks for rail and underground. These costs are also sunk costs, and they deter entry and exit. With natural monopolies, economies of scale are very significant so that minimum efficient scale is not reached until the firm has become very large in relation to the total size of the market.

Minimum efficient scale (MES) is the lowest level of output at which all scale economies are exploited. If MES is only achieved when output is relatively high, it is likely that few firms will be able to compete in the market. When MES can only be achieved when one firm has exploited the majority of economies of scale available, then no more firms can enter the market. Natural monopolies are

[74] (Economics Online - Natural Monopolies, 2015)

common in markets for 'essential services' that require an expensive infrastructure to deliver the good or service, such as in the cases of water supply, electricity, and gas, and other industries known as public utilities. Because there is the potential to exploit monopoly power, governments tend to nationalise or heavily regulate them. On the other hand, trying to increase competition by encouraging new entrants into the market creates a potential loss of efficiency. The efficiency loss to society would exist if the new entrant had to duplicate all the fixed factors - that is, the infrastructure. So it may be more efficient to allow only one firm to supply to the market because allowing competition would mean a wasteful duplication of resources.

Railways are often considered a typical example of a natural monopoly. The very high costs of laying track and building a network, as well as the costs of buying or leasing the trains, would prohibit, or deter, the entry of a competitor. To society, the costs associated with building and running a rival network would be wasteful. The best way to ensure competition, without the need to duplicate the infrastructure, is to allow new train operators to use the existing track; hence, competition has been introduced, without duplication of costs. This is called opening-up the infrastructure.

4.2.3.3 Pricing

If a monopoly is unregulated and privately owned, the profits are likely to be excessive even in the long run. As there are no substitutes a monopolist is free to choose any price for the good or service offered. Assuming that any supplier is trying to maximise profit, a monopolist will charge whatever price will yield the greatest profit. How to calculate this price? According to the demand curve a price is connected to a quantity demanded and a turnover as well. And any quantity demanded leads to certain costs. Profit is calculated as turnover minus costs, thus the monopolist can calculate the profit by using simple mathematics only. The maximum profit may be calculated by differentiating the profit function, by trial and error or by using the solver-application of a spreadsheet software.

Please note: A monopoly does not have a supply curve. The quantity it wants to supply cannot be separated from the demand side of the market. At the monopoly price, it will supply the monopoly quantity. It does not make sense to ask how much it would supply at other prices.

4.2.3.4 Evaluation of monopolies

Monopolies can be criticised on a number of disadvantages to the consumer, including[75]:

- Allocative inefficiency, i.e. restricting output onto the market.
- Productive inefficiency because of no competition.
- Charging a higher price than in a more competitive market.
- Deadweight losses, as consumer surplus and economic welfare are reduced.
- Restricting choice for consumers.
- Reducing consumer sovereignty.

Moreover, monopolies have some disadvantages to the whole economy:

- A less competitive economy in the global market-place.
- A less efficient economy in terms of allocation and production.
- A loss of management efficiency associated with markets where competition is limited or absent.
- Less employment in the economy, as higher prices lead to lower output and les need to employ labour.

[75] (Economics Online - Monopoly, 2015)

But there are some advantages of monopolies:

- They can benefit from economies of scale, and may be natural monopolies, so it may be argued that it is best for them to remain monopolies to avoid the wasteful duplication of infrastructure that would happen if new firms were encouraged to build their own infrastructure.
- Domestic monopolies can become dominant in their own territory and then penetrate overseas markets, earning a country valuable export revenues. This is certainly the case with Microsoft.
- It has been consistently argued by some economists that monopoly power is required to generate dynamic efficiency, that is, technological progressiveness. This is because:
    - Innovation is more likely with large enterprises and this innovation can lead to lower costs than in competitive markets. A firm needs a dominant position to bear the risks associated with innovation.
    - Firms need to be able to protect their intellectual property by establishing barriers to entry. Otherwise, there will be a free rider problem. Why spend large sums on R&D if ideas or designs are instantly copied by rivals who have not allocated funds to R&D?
    - However, monopolies are protected from competition by barriers to entry and this will generate high levels of supernormal profits. If some of these profits are invested in new technology, costs are reduced via process innovation. This makes the monopolist's supply curve to the right of the industry supply curve. The result is lower price and higher output in the long run.

4.2.3.5 Monopoly regulation

It is widely believed that the costs to society arising from the existence of monopolies and monopoly power are greater than the benefits and that monopolies should be regulated.[76] When monopolies are not ended by the open market, diverse options are available to regulators:

- Regulators can set price caps. This means forcing the monopolist to charge a price, often below profit maximising price.
- An alternative to price-cap regulation is rate-of-return regulation. Rate of return regulation is a method of regulating the average price of private or privatised public utilities, such as water, electricity and gas supply. The system, which employs accounting rules for the calculation of operating costs, allows firms to cover these costs, and earn a 'fair' rate of return on capital invested. The 'fair' rate is based on typical rates of return which might be expected in a competitive market.
- Regulators can prevent mergers or acquisitions, or set conditions for successful mergers.
- Bringing the monopoly under public control, in other words to nationalise it, or breaking-up the monopoly. Public utilities, often being naturally efficient with only one operator and therefore less susceptible to efficient breakup, are often strongly regulated or publicly owned instead.

4.2.4 Monopolistic competition

The model of monopolistic competition (MC) describes a common market structure in which firms have many competitors, but each one sells a slightly different product.[77] Many small businesses operate under conditions of monopolistic competition, including independently owned and operated high-street stores, consumer services such as hairdressing, hotels, pubs, and restaurants. In the case of restaurants, each one offers something different and possesses an element of uniqueness, but the

[76] (Economics Online - Monopoly, 2015)
[77] (Economics Online - Monopolistic Competition, 2015), (Wikipedia - Monopolistic Competition, 2015)

differences are not so great as to eliminate other goods as substitutes. MC goods are best described as close but imperfect substitutes: The goods perform the same basic functions but have differences in qualities such as type, style, quality, reputation, appearance, and location that tend to distinguish them from each other. For example, the basic function of cars is the same—to move people and objects from point to point in reasonable comfort and safety. However, there are many different firms producing cars in many variations and every proud owner of a Daimler-Benz car knows for sure that this vehicle is absolutely unique in point of quality, safety, comfort etc.

A central feature of monopolistic competition is that products are differentiated. There are four main types of differentiation:

- Physical product differentiation, where firms use size, design, colour, shape, performance, and other features to make their products different. For example, consumer electronics can easily be physically differentiated.
- Marketing differentiation, where firms try to differentiate their product by distinctive packaging and other promotional techniques. Fashionable clothing brands frequently differentiates by promotion only, like e.g. Hollister resp. Abercrombie & Fitch, who successfully sold t-shirts by operating surprisingly different stores.
- Human capital differentiation, where the firm creates differences through the skill of its employees, the level of training received, distinctive uniforms with a clear recognition value, and so on.
- Differentiation through distribution, including distribution via mail order or through internet shopping, such as Amazon, which differentiates itself from traditional bookstores by selling online, or Ebay, which enables everybody to sell by auction.

Other features of monopolistic competition are:

- Each firm makes independent decisions about price and output, based on its product, its market, and its costs of production. Firms are price makers and are faced with a downward sloping demand curve. Because each firm makes a unique product, it can charge a higher or lower price than its rivals. The firm can set its own price and does not have to ‘take’ it from the industry as a whole, so far being quite similar to monopolies, though the industry price may be a guideline, or becomes a constraint. This also means that the demand curve will slope downwards.
- Knowledge is widely spread between participants, but it is unlikely to be perfect. For example, diners can review all the menus available from restaurants in a town, before they make their choice. Once inside the restaurant, they can view the menu again, before ordering. However, they cannot fully appreciate the restaurant or the meal until after they have dined.
- The entrepreneur has a more significant role than in firms that are perfectly competitive because of the increased risks associated with decision making, thus tending to maximise profits.
- There is freedom to enter or leave the market, as there are no major barriers to entry or exit. If there were significant barriers the situation would be more or less similar to a monopoly.
- Firms operating under monopolistic competition usually have to engage in advertising. As there are usually large numbers of independent firms competing in the market, incumbents are often in fierce competition with other firms offering a similar product or service, and may need to advertise precisely, to let customers know their differences.
- In the short run supernormal profits are possible, but in the long run new firms are attracted into the industry, because of low barriers to entry, good knowledge and an opportunity to

differentiate. As in the long run new firms, attracted by super-normal profits, may enter the market, demand for the existing firm's products becomes more elastic and the demand curve shifts to the left, driving down price. Eventually, all super-normal profits are eroded away, if existing firms are not successful in further differentiation or defending a unique selling proposition.

When evaluating monopolistic competition the following economic advantages may be found out:

- There are no significant barriers to entry; therefore markets are relatively contestable.
- Differentiation creates diversity, choice and utility. For example, a typical high street in any town will have a number of different restaurants from which to choose.
- The market is more efficient than monopoly but less efficient than perfect competition in terms of allocation and production. However, they may be dynamically efficient, innovative in terms of new production processes or new products. For example, retailers often constantly have to develop new ways to attract and retain customers.

However, there are several potential disadvantages associated with monopolistic competition, including:

- Some differentiation does not create utility but generates unnecessary waste, such as excess packaging. Advertising may also be considered wasteful, though most is informative rather than persuasive.
- Assuming profit maximisation, there is allocative inefficiency in both the long and short run. This is because price is above marginal cost in both cases and because there is a tendency for excess capacity: Firms can never fully exploit their fixed factors as long as mass production is difficult. Allocative inefficiency is lower in the long run because of upcoming competition, thus leading to lower prices, but inefficiency still exists.

As an economic model of competition, monopolistic competition is more realistic than perfect competition: Many familiar and commonplace markets have many of the characteristics of this model. The existence of monopolistic competition partly explains the survival of small firms in modern economies. The majority of small firms in the real world operate in markets that could be said to be monopolistically competitive.

4.3 Laws of supply and demand

Supply and demand curves represent the relationship between the price and the quantities supplied and demanded respectively. Changes in the price of the good are represented as movements along unchanged supply and demand curves. Obviously the price of a good or service is the most important determinant, but as stated before, there are a couple of additional determinants with influence on quantities too. However, supply and demand curves are plotted in 2-dimensional charts, showing price and quantity only. In case of any change in one or more of these additional determinants the curves have to be replaced by new ones. This is often described as 'shifts' in the curves:[78]

- Demand curve shifts: A movement along the curve is described as a 'change in the quantity demanded' to distinguish it from a 'change in demand', that is, a shift of the curve. Increased demand can be represented on the graph as the curve being shifted to the right. At each price point, a greater quantity is demanded, as from the initial curve to the new curve. This raises the equilibrium price and the equilibrium quantity as well. If the demand decreases, then the opposite happens: A shift of the curve to the left. The equilibrium price will decrease, and the equilibrium quantity will also decrease. The quantity supplied at each price

[78] (Wikipedia - Laws of Supply and Demand, 2015)

is the same as before the demand shift, reflecting the fact that the supply curve has not shifted; but the equilibrium quantity and price are different as a result of the shift in demand.

- Supply curve shifts: An 'increase in supply', to be distinguished from an 'increase in quantity supplied', results from a change of one or more determinants except the price and can be represented on the graph as the curve being shifted to the right. This increase in supply causes the equilibrium price to decrease and the equilibrium quantity to increase as consumers move along the demand curve to the new lower price. As a result of a supply curve shift, equilibrium price and quantity move in opposite directions. Just the opposite happens if a decrease in supply occurs: The supply curve shifts leftward, the equilibrium price will increase and the equilibrium quantity will decrease as consumers move along the demand curve to the new higher price and associated lower quantity demanded. The quantity demanded at each price is the same as before the supply shift, reflecting the fact that the demand curve has not shifted. But due to the shift in supply, the equilibrium quantity and price have changed.

Of course, the laws of supply and demand are simplifying economic reality to a great extent, but nevertheless supply and demand analysis is a useful conceptual tool to gain an abstract understanding of a complex world. Keeping this in mind, shifts in supply and demand curves may be generally used to explain the following developments in economy:

- Inflationary growth: A shift of the demand curve to the right leads to a higher equilibrium price (inflation) and quantity (growth). This situation is typical for the economy in Germany during the 1960th, when significant economic growth ('Wirtschaftswunder') met inflation with yearly rates of 5% and more.
- Bad deflation: A shift of the demand curve to the left leads to a lower equilibrium price (deflation) and a lower quantity (crisis). In the early 1930th the USA were shaken by a bad deflation, following a crash of the capital markets and supported by severe mistakes of monetary politics (the 'great depression'). An example for a bad deflation in younger history is Japan: Again caused by a crash of capital markets at the beginning of the 1990th asset prices started to decline sharply, causing a sustaining decrease in consumers' demand and falling prices (the 'lost decade').
- Good deflation: A shift of the supply curve to the right leads to a lower equilibrium price (deflation) and a higher quantity (growth). In history there is only one period of good deflation in Germany, starting with the revolution of 1848 and ending with a bursting bubble on the capital markets in 1873. This period is characterised by industrialisation, increasing productivity and output, and falling prices ('Gründerjahre'). Demand increased because many people started to consume products and services which they couldn't afford in former times.
- Stagflation: A shift of the supply curve to the left leads to a higher equilibrium price (inflation) and a lower quantity (crisis or stagnation).[79] This happened to a great extent during the 1970s, when world oil prices rose dramatically, fuelling sharp inflation, slowing down economic growth and increasing unemployment in developed countries ('Ölkrise').

4.4 Cobweb model

The cobweb model or cobweb theory is an economic model that explains why prices might be subject to periodic fluctuations in certain types of markets.[80] It describes cyclical supply and demand in a market where the amount produced must be chosen before prices are observed. Producers'

[79] By the way: 'Stagflation' is an artificial word built from 'stag'-nation and in-'flation'.
[80] (Wikipedia - Pork Cycle, 2015)

expectations about prices are assumed to be based on observations of previous prices. The cobweb model is based on a time lag between supply and demand decisions and adaptive expectations. Agricultural markets are a context where the cobweb model might apply, since there is a lag between planting and harvesting or growing animals, thus leading to the popular terms ‘pork cycle’, ‘hog cycle’ or ‘cattle cycle’.

The process starts with an increase in demand, i.e. a shift of the demand curve to the right. Suppliers are prepared to deliver a certain quantity that is fixed in the short run. Following the new demand curve and the given supply curve the price starts to increase until the new equilibrium price is reached. Suppliers realise this higher price and prepare themselves to produce the quantity that is related with this price. In his model, when prices are high more investments are made. Their effect, however, is delayed due to the breeding time. Then the market becomes saturated which leads to a decline in prices. As a result of this, production is reduced, i.e. the suppliers are preparing themselves on the lower quantity that is again related with the lower price. The effects take a long time to be noticed but then lead to increased demand and again increased prices. This procedure repeats itself cyclically. Under certain conditions the resulting supply-demand graph resembles a cobweb.

One reason to be sceptical about this model's predictions is that it assumes producers are extremely short-sighted. Assuming that farmers look back at the most recent prices in order to forecast future prices might seem very reasonable, but this backward-looking forecasting (which is called adaptive expectations) turns out to be crucial for the model's fluctuations. When farmers expect high prices to continue, they produce too much and therefore end up with low prices, and vice versa.

Economists know about this dilemma, but economic reality shows that a pork cycle can be observed in many markets, including housing and studying. With housing the ‘breeding time’ is the time for completion and at the university it is the necessary time to finish a Bachelor course, that’s 6 or 7 semesters. However, there is an interesting bias in adaptive expectations between male and female students: Male students typically choose a course of studies with good expectations, mainly using the current job situation for graduates as an indicator for future development. As a result there is a distinctive pork cycle in all male dominated courses, such as mechanical engineering and electrical engineering. Female students typically choose a course of studies in which they are interested in, no matter what the expectations are. As a result there is no pork cycle in female dominated courses, such as architecture, primary school teachers and languages.

5 Macroeconomic models

5.1 Classical economics

Economist do believe in this self-adjusting property of markets, always resulting in an equilibrium.

Deflation, or negative inflation, happens when prices fall because the supply of goods is higher than the demand for those goods.[81] This is usually because of a reduction in money, credit or consumer spending. This can be caused by a combination of different factors, including

- having more goods produced than there is demand for, which means that businesses must decrease their prices to get people to buy those goods,
- not having enough money in circulation, which causes those with money to hold on to it instead of spending it,
- having a decreased demand for goods overall and therefore decreased spending.

While it may seem like lower prices are good, deflation can ripple through the economy, such as when it causes high unemployment, and can turn a bad situation, such as a recession, into a worse situation, such as a depression.

Deflation can lead to unemployment because when companies make less money, they react by cutting costs in order to survive. This includes closing stores, plants and warehouses and laying off workers. These workers then have to decrease their own spending, which leads to even less demand and more deflation and causes a deflation spiral that is hard to break. This negative development in economy is called 'bad deflation'.

The only time deflation can work without hurting the rest of the economy is when businesses are able to cut the costs of production in order to lower prices, such as with technology. The cost of technology products has decreased over the years, but it is because the cost of producing that technology has decreased, not because of decreased demand. The lower prices are enabling more customers to consume goods or services they couldn't afford in former times, thus demand is increasing and the economy is growing because of decreasing prices. This positive development in economy is called 'good deflation'.

[81] (Investopedia - Deflation, 2015)

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